

PNARG-971

69770

**A Review of
"Tomorrow's Environment for
Agricultural Development"**

by

**Dennis T. Avery
for Winrock Colloquium**

October, 1988

Prepared by

Center for Research on Economic Development

In partial fulfillment of

Contract #PDC-0180-0-00-8121-00

Bureau of Program and Policy Coordination

U.S. Agency for International Development

Tomorrow's Environment for Agricultural Development

Dennis T. Avery

for Winrock Colloquium

OVERVIEW

This paper provides a cogent look at where current political and economic trends in world agriculture are going and what they are likely to mean for LDCs. Avery foresees a long term secular tendency for commodity prices to remain low or to drop even further. This will make "export-led" development strategies even more difficult to carry out than they currently are and may induce LDCs to switch agricultural resources from export production to supplying local labor-intensive industries with raw materials.

HIGHLIGHTS OF PAPER

The Inevitable Downward Trend in Prices

Agricultural prices, particularly food prices are likely to continue to fall in the foreseeable future. This follows from the simple fact that world-wide agricultural production growth is far outstripping population growth. During the 1980s, world population has been growing at an annual rate of about 1.8%, while non-US grain production has been rising at 2.8% and non-US oilseed production has been rising at an even faster clip of 4.5 to 5%. Although some areas lag well behind these averages, even Africa—which is only borderline self-sufficient—has had difficulty consuming all the grain it received during the 1983/84 drought.

A large part of this booming production is due to advances in technology, which has boosted yields in both the developed and under-developed worlds. In fact, the biggest overall success story of world agriculture in the 1980s is surely that of the agricultural research stations throughout the globe that have developed the new high-yield and environmentally adapted varieties in use almost everywhere. To those who hold that agricultural research has yielded less than impressive results and support their views with evidence that aggregate yield trends have not been increasing, Avery counters with the assertion that demand constraints are responsible for much of the stagnation in third world agriculture and that productive potential really has increased.

To realize the gains from more effective agricultural technology, countries must eliminate policies that have constricted demand and penalized productivity. Avery's fundamental optimism about future production in LDCs stems, in large part, from his belief that more and more poor countries are abandoning past policies which held back agricultural growth. He cites the convincing case of China where the realignment of the agricultural sector along market lines led to an impressive growth record.

One final trend likely to spur production increases is the greater use of underutilized natural resources, which Avery says will accompany agricultural policy reforms. His prime examples of resources that are waiting to be put into use include: the water resources of the upper Euphrates river in Turkey (which plans to build a series of dams in the near future), 50 million hectares of potentially productive farmland in the Cerrado Plateau region of Brazil, and the huge tracts of arable land in the southern and western regions of the Sudan which currently lack the infrastructure necessary for commercial farming.

The Decline of Famine as a Rationale for AID

Avery argues that "development organizations have too long relied on famine predictions to sell development. (p. 7)" He says that this kind of thinking has been responsible in the past for an overemphasis on food give-away programs (in part to placate agricultural interest groups in the developed nations). With rising levels of production in the Third World, such programs are already becoming irrelevant. Thus, the First World will no longer be able to think of aid as a way of dealing with its own policy induced farm surpluses.

LDCs and the World Agricultural Trade

Because nations in the developed world seem to be following policies of food self sufficiency—protecting domestic farming interests through price supports and import quotas, LDC exporters are faced with "a double whammy (p. 9)" on prices and volumes in the world farm trade. Although ending the current subsidy patterns in the First World would do much to raise LDC export earnings, such reforms are extremely unlikely to come to pass.

Thus, in lieu of action on the developed world farm subsidy front, LDCs can expect their terms of trade to continue to fall. This means that it is vital that LDCs "continue to seek the lowest possible production and infrastructure costs if their agricultures are to expand successfully. (p. 12)" Because world conditions are not likely to favor export-led growth strategies, the chief gains from increased agricultural productivity will not be felt in the export sector but rather in improved nutrition for non-farm workers and in lower cost inputs for local industries.

AID Success Lessons

Avery identifies two primary successes of aid in the area of agriculture: (1) it has brought about a revolution in agricultural research, principally by funding the CGIAR centers around the globe and (2) it has significantly strengthened the capacities of national development organizations by funding training programs that have vastly improved the human capital resources of those agencies

The principal shortcoming of many aid programs is that they have "legitimized institutions and policies that did not deserve it" (p. 15). Avery lists the World Bank's Basic Human Needs programs as a prime example of aid pumping resources into projects with little impact on medium or long term development.

As for the future direction of aid policy, Avery sees its biggest task to be the creation of "really pro-competitive economic policies" (p. 16). Although many countries are beginning to believe in economic incentives as a way of encouraging production, less progress has been made on issues revolving around promoting competition as a way of improving allocative efficiency. Avery seems to think that the obstacles to greater competition are mainly psychological, in that many people in the third world associate a profusion of economic intermediaries with greater exploitation of the productive elements in society.

Avery closes with a plea for rethinking the relationship between donor organizations and recipient governments. Specifically, he calls for considering such novel ideas as channeling more funds directly to private economic actors rather than to government development agencies.

Tommorrow's Environment for Agricultural Development

Dennis T. Avery, Senior Agricultural Analyst,
Bureau of Intelligence and Research
U.S. State Department

at the
Winrock Foundation Colloquium on the
Future of Agricultural Development Aid

Petitjean Mountain, Arkansas,
Feb. 10-12, 1988.

Summary

World farm commodity prices are virtually certain to continue their long-term decline, and could fall quite sharply in the upcoming years. New technology, more incentive-oriented farm policies and normal resource development continue to increase farm productivity potential in most countries. These factors are amplified by ample capital for resource development and production subsidies in the affluent countries.

If the world's current farm trade rules stay in place, most countries will probably continue to seek agricultural self-sufficiency, in response to technical capabilities and the pressures of their own farm lobbies. Export potential is not likely to grow as rapidly as production potential with the current pervasive use of trade constraints. LDCs and developed-country farm exporters would thus be thrown into a fierce competition to sell increasing farm product volumes in a stagnant or declining market. Prices would fall to drive out countries, farmers or inputs not needed to meet the effective trade demand.

Even if the world's farm trade rules are reformed, world prices are likely to come down sharply. The affluent countries currently now have a farm surplus capacity equal to at least 150 million grain-equivalent tons per year, and it continues to rise. (The 1987 U.S. cropland diversion program alone represented about 110 million tons of grain surplus.) That volume of surplus could not possibly be sold at current prices, even if the world's farm trade barriers were immediately eliminated. Thus, prices would have to come down to discourage the use of some purchased inputs and to encourage more consumers to improve their diets with lower-cost protein foods.

(In the long term, lower costs and continued research developments may very well permit farms to produce some industrial feedstocks cost-competitively, expanding farm markets beyond their traditional food and fiber base and permitting farm resources to make a larger economic contribution. However, low costs will be crucial to such a development, so industrial sales are likely to expand sales volume rather than raise asset and product prices.)

If LDC farmers face a continued decline in commodity prices, then the outlines of appropriate farm and development policies is harsh and clear. A continued flow of farm research must provide land-enhancing farm technologies with low out-of-pocket costs. There will be no price boom to furnish large chunks of investment capital, so governments will have to encourage their citizens and businessmen to invest in the farm technologies and infrastructure necessary to lead economic growth.

Exports of raw commodities will be even less effective as engines of growth. The big gains from LDC agricultural development will be adequate nutrition (and thus political and economic stability); low-cost wage goods for non-farm workers; and low-cost industrial raw materials for labor-intensive industries. (Examples include cotton and other fibers for textiles, leather for shoes and other leather goods; and sugar and fruits for confections.)

LDCs will have no more "farm surplus" to tax than they have had in the past, and possibly less. It will be terribly difficult to get agricultural growth at all if governments persist in past policy mistakes, such as inefficient and overstaffed parastatals, overvalued exchange rates and discouraging tax policies.

The biggest agricultural development aid success has been and probably will continue to be the building of successful agricultural research institutions. The second-biggest success has been training for professional scientists from the LDCs. (The training and research have apparently yielded high profits for the agricultures and economies of both developed and developing countries.)

Other types of development aid have been less successful than research and training. One major reason may be that the characteristically weak governmental, scientific and economic institutions of developing countries were not capable of properly supporting or absorbing the other types of large aid programs.

The success of the ASEAN countries and China during recent years strongly suggests that one of the keys to development success is dynamic, pro-competitive national economic policies. Aid programs have typically been administered on a non-competitive government-to-government basis. It may be possible to achieve stronger rates of development growth if aid programs can be made more competitive. Perhaps this could be achieved by going below the level of the national government, offering loans and grants to smaller institutions within LDCs, such as farmer cooperatives, key industries, or even tribes and villages. Such a pro-competitive shift implies major changes in the way aid is administered by donors and received by LDCs. However, the famine impetus for aid is fading fast. Failure to achieve better development results may mean a significant decline in the relevance of development aid, or even its disappearance in a cloud of public apathy and competitive hostility.

Tomorrow's Agricultural Development Environment

Agricultural development programs have achieved some amazing success stories, starting with the Green Revolution and continuing to the present. Development programs have contributed importantly to the world's remarkable progress toward adequate food supplies. Moreover, agricultural development still has a major contribution to make so long as billions of people in the world are still not eating as well as they would like, and most of the world's poverty is in rural areas.

Agricultural development, however, will face a radically different policy environment in the years ahead--because the context of world agriculture is changing radically and rapidly at this moment in history.

I. The Factors Forcing Farm Change

The biggest factor for change is the enormous progress being made in world food production. The World Bank recently estimated that per capita food production in the world has been gaining about a full percentage point per year in the world since 1980. In the 1980s, world population has been growing about 1.8 percent annually, while non-U.S. grain production has been rising at 2.8 percent per year and non-U.S. oilseed production has been rising at 4.5 to 5 percent. (U.S. production is heavily skewed by its residual-exporter status and its cropland diversion programs.)

It is true that not all of the developing world has participated equally in the global food production gains. Africa, in particular, remains on the borderline of food self-sufficiency for many of its people. However, most African countries have had trouble using and storing the increased grain production stimulated by the 1983/84 drought, pointing up both the latent food production potential in that continent and the terrible inelasticity of food demand among low-income consumers. At least five Sub-saharan African nations were active in the world grain export market in 1987, because they have no livestock industries to absorb extra grain, little storage and a shortage of capital to hold grain against future droughts.

The real famine situations in the world recently correlate with the presence of armed conflict, the absence of national agricultural research activities, national policies that discourage farmers, rather than with lack of agricultural resources.

Technology

Better agricultural technologies -- especially better seeds -- have spread rapidly in most of the world's countries. Wheat yields in Western Europe have tripled since 1960. Asian rice yields have nearly tripled in the same period. Triticale, brought to a high stage of development by CIMMYT, is the latest "miracle crop" in Poland and Portugal, and being test-planted in 50 other countries. China has pioneered the world's first hybrid rice varieties. Plantings of hybrid sunflower are rapidly expanding in Italy, the Soviet Union, Argentina and Thailand. Nigeria has high-yielding new cassava, Sudan new high-yielding sorghum. Shorter-season corn hybrids are moving north in China, Poland, East Germany and the USSR, south in Argentina. Brazil has just announced the first high-yielding corn hybrid for the aluminum-saturated tropical soils that constrain corn yields in its Cerrado Plateau; BR-201 yields up to 135 bushels per acre in a country with a national average of 40 bushels.

The impact of better seeds is being amplified by fertilizers available at declining real cost per ton of production, by irrigation with rising rates of water efficiency, by more effective pesticides with fewer ecological impacts, and by a host of new farming systems and processing technologies.

The impacts of better technologies, as always, are rippling around the world. Wheat seeds were carried from the Old World to the new, and New World corn and tomatoes carried to the Old; so the semi-dwarf Green Revolution wheat and rice varieties have spread wherever they were adapted, and have been adapted by national research programs in many places where they initially were not effective. The latest palm oil varieties, developed in Southeast Asia, are now being planted in Latin America, and are probably also headed back to their point of origin in West Africa. The HYV soft winter wheat varieties pioneered by British researchers have spread across Europe as far as Germany and Poland. Brazil's new corn hybrid probably has potential for much of South America -- and for much of southern and western Africa where aluminum-saturated soils are a major corn production constraint.

Conservation tillage has spread rapidly on the world's mechanized farms in the last dozen years, cutting soil erosion and tractor fuel costs. India and ICRISAT have developed a tillage system that gives two good crops a year instead of one poor one from millions of hectares of "cracking clay" soils; the system has been widely adopted in India and is now being extended in Sudan and Ethiopia. Ridge tillage saves more water and thus raises crop yields 20 percent in East Africa; tied ridges offer even greater potential in West Africa. Alley cropping now offers the first fully sustainable cropping system

ever available in much of West Africa.

The impacts of new farm technology are most visible in the developed countries, where education, capital, infrastructure -- and often subsidies -- speed rates of adoption. Yields have risen much faster than demand in the First World, stacking millions of tons of surplus grain, sugar and livestock products in government warehouses. The OECD says farm production in its member countries has been rising 1.5 percent per capita in the 1980s, while per capita consumption has been stagnant. At least 35 countries now consistently produce farm surpluses. The use of the farm subsidies that have stimulated these surpluses is broadening beyond the affluent countries to such newly-emerging economies as South Korea, Taiwan, India, Brazil and many others.

Agricultural progress is less visibly startling but still very rapid in the LDCs as well, probably more rapid than most of the world realizes. Yield trends are not rising as rapidly in LDCs as in the developed countries--but they are generally rising as rapidly as effective consumer demand. We have too often overestimated the impact of population growth on world food needs. Relatively few agricultural resources are needed to produce people's minimal caloric needs through direct consumption of cereals and root crops. Moreover, many of those needs are capable of satisfaction through the consumer's own more intensive efforts at subsistence cultivation. We have too often underestimated the importance of per capita income growth on world food demand. Far more resources both on and off the farms are needed to satisfy the demand of affluent consumers for high-value, high-protein diets.

Africa's nations may well continue trying to export their food surpluses for another decade or more, until higher consumer incomes and/or sharply lower real farm production costs expand its livestock industries and effective demand.

(China offers an opposite example, where consumer demand for protein foods has been rising very rapidly despite low per capita incomes. However, the Chinese government has chosen to subsidize its consumers with relatively low prices for those foods. If and when consumers must pay the real cost of producing those foods (as opposed to letting farmers export them or raise other cash crops) then consumption patterns are likely to fall quickly back toward the more common patterns.)

CIAT has done a wonderful job of breeding food bean varieties with radically increased yields for Latin America. National yield trends don't show much increase, however, because food bean demand is relatively static. The mere fact of higher yield potential doesn't spur rapid adoption. Most of

the bean production is for subsistence. The easiest way to grow food beans in the region is to throw a few seeds on a hillside and chop weeds onto them. That system offers very low labor costs, little erosion, and fair disease protection. Unless population growth or urbanization produce a commercial market for more beans, farmers won't reach out for the new varieties even if their only cost is a five-mile walk for the seed.

Those who argue that agricultural technology has not made much impact because the yield trends have not increased may well be looking at the demand constraint and underestimating the long-term increases in productive potential. When effective demand does increase in those areas, new technologies and local resource development may make LDC farmers very competitive in supplying a major part of it.

Farm Policy Reform

In recent decades, the developing world has also learned some important lessons about national policies which encourage agricultural productivity. Some of these lessons have been learned the hard way, by playing out poor policies to the point of inducing actual stress failures in live economies.

There is now a growing consensus that the success model for agricultural policy in LDCs is based on relatively small family farms, national research programs, an effective farmer education effort, and farmer price incentives.

-- Perhaps the most dramatic case for this model has been made by China, which broke up its big communal farms after 1979, leased the land back to families and small work groups, and raised farm-gate prices by roughly 25 percent. Chinese agricultural output promptly rose by a third in six years. China still has enormous agricultural development problems ahead, particularly in pricing and transportation development. But the basic success of its family-farm, market-oriented agriculture is beyond doubt.

-- Kenya and Zimbabwe have demonstrated the value of the family farm success model in Africa. Kenya has had Africa's most successful agriculture, in terms of both food security and cash crop contribution to its economy, over the years since 1960. Its agriculture was consciously developed along family farming lines. Neighboring Tanzania, with very similar farming resources, attempted to use a centrally-planned "command" farming model based on pulling scattered family farms into big, socialized farming villages. But the government was unable to provide the technology and expertise that would have modernized farming methods. Farmers were discouraged by low prices and communal land tenure, and retreated into subsistence production. Tanzania's national economy was then devastated by lack of the foreign exchange which had been provided by such

cash crops as cotton, cashews and coffee.

-- Zimbabwe in the 1980s has cleaned up its corn hybrids and began actively encouraging its traditional small farmers to use the seeds with extension efforts and price incentives. Zimbabwe has recently produced more grain than it consumes, and is now shifting farm resources to expand oilseed production.

-- One of the most interesting experimental comparisons is in El Salvador; Salvador's large cooperative farms are doing poorly despite having the country's best land, while the tiny Phase III owner-operated farms on marginal land are raising their yields, adding tools, planting tree crops, making conservation investments -- and buying more land.

-- Even in plantation crops, recent experience seems to favor the "outgrower" system in which only a core plantation immediately surrounding the processing facility is centrally managed. Outlying land is more successful when intensively managed by small farmers who contract with the core processor.

-- Other alternatives have certainly been tried: Ethiopia has tried State farms, and gotten dismal productivity that left the country open to repeated widespread famine. Nigeria put huge sums of cash into corporate mechanized farms, and the machinery now rusts in abandoned fields. Malawi established tobacco plantations that were relatively successful in raising tobacco output quickly -- but also produced more alienated, landless and jobless people.

The Third World has also learned that incentives are crucially important for farm support functions. Too many countries put fertilizer distribution and crop marketing in the hands of government-sponsored monopolies with too little incentive to get inputs into the farther corners and too much interest in finding jobs for cronies. In Ghana, by 1985, the Cocoa Marketing Board had a staff of 103,000; in the 1950s, the Board had exported four times as much cocoa with less than a tenth the staff. Even in Kenya, grain marketing charges are still so high that only 10 about percent of the crop is marketed off the farm; farmers apparently plant enough for their own needs plus a margin against lack of rain, and the

Grain Board gets the surplus from those farms that have good rainfall.

A whole host of countries found that overvalued exchange rates effectively penalized their agricultures by making food imports seem cheaper, and farm exports less valuable.

Resource Development

Many LDCs also have continued to develop unused or underused resources, and even more such resources are likely to be developed as effective demand rises:

-- Turkey is building a series of dams on the upper Euphrates River which will produce electric power -- and irrigate millions of hectares of land now in low-yield dryland farming.

-- Kenya has huge tracts of land between Nairobi and the sea that are too dry for corn -- but which could produce sunflowerseed, peanuts, sorghum and other crops.

-- The big plain surrounding Ghana's capital city, Accra, is similarly too dry for corn, and largely uncropped; a poultry industry could be founded there utilizing sorghum, sunflowerseed, and fishmeal from the adjoining ocean.

-- Brazil estimates it has 50 million hectares of brushland on its Cerrado Plateau that could be converted into productive cropland with phosphate and lime. Brazil wants to build three railroads into the region that would move farm products cheaply to its Northeastern food deficit region and to export ports on the coast.

-- Sudan has huge tracts of arable land in its southern and western regions, though they lack the infrastructure to support commercial farming.

Even where there are no extensive unused resources, economic growth normally stimulates farmers to keep improving their productivity with water conservation, sub-soil tillage, terracing, double-cropping, higher plant populations, tree crops and other more intensive management techniques.

We should expect such resources to become more fully developed in the normal course of economic growth, and their latent productivity potential should be projected more carefully than it has been.

Farm Subsidy Failures

As a final factor forcing farm change, farm subsidies have proven a poor way to generate productivity and growth. The OECD has recently estimated that the cost of farm and consumer food subsidies in its member countries doubled between 1979 and 1986 without bringing the countries noticeably closer to their

intended farm policy goals. In LDCs, subsidies have generally failed to raise productivity and efficiency:

-- Fertilizer subsidies tended to go to political supporters and encouraged graft, with far less than optimum use and production gain from the scarce input;

-- Subsidies to commercial farms in such countries as Zaire and Zimbabwe produced modern-looking commercial farms that spent too much on off-farm inputs, while the huge latent productivity of their traditional sectors lay untapped.

-- Price subsidies were often unable to overcome the constraints on market-oriented farming, such as overvalued exchange rates, high tax rates, etc.

-- Price supports and trade barriers in the developed countries mainly boosted farm land values and diverted more capital into farm chemicals and machinery. Thus they have raised farmers' costs and diminished the real opportunities for family farms in the subsidizing countries while they increasingly distorted world farm production patterns.

-- When farm subsidies and trade barriers are used pervasively, as they have been in recent years, it is now clear that even their short-term benefits for recipient farmers tend to cancel out, leaving farm costs higher, the total market for all farmers smaller, and the world's consumers and taxpayers worse off. Basically, subsidies have led to dreadfully wasteful resource use.

II. Famine Rationale Fading

The world's improving food production is bound to produce changes in the public attitudes toward agricultural development. Aid's strongest political weapon until now has been the threat of famine. Lately, the famine weapon has been fading rapidly. India suffered its worst monsoon failure of this century in 1987 -- and had enough grain stockpiled from previous big crops to cover a shortfall of more than 20 million tons. During the 1960s, tens of millions of tons of grain imports were needed to prevent Indian famines.

Some African countries have reformed some of their most discouraging farm policies, and countries like Zimbabwe and Nigeria are aggressively seeking farm productivity. The next major continental drought in Africa will again produce widespread hunger -- but in less stressed years, most African countries will likely feed their populations at least minimally adequate diets.

The success stories of more successful countries, both in Africa and elsewhere, should spotlight the negative policies of the famine-stricken countries. Already, the public is learning to associate famine with armed conflict and repressive governments (Ethiopia,, Mozambique, Tanzania).

The development organizations have too long relied on

famine predictions to sell development. Now, with famine fading as a program rationale, they will have to make the correct but more abstract "economic growth" arguments for agricultural development aid. Unfortunately, they must now make them while First World publics are thinking about trade and budget deficits.

The agricultural development community must also struggle with the increasing perception of developed-country farmers that LDC agricultural development is a threat to their own incomes and land values. This perception is almost certainly wrong; the farmers of the affluent world have no stake in continuing poverty in the Third World. Moreover, during the middle stages of economic growth, countries' agricultural imports tend to rise rapidly. But so long as relatively high prices limit farm products to food and fiber, then the farmers of the First and Third worlds really are in competition with each other.

A few First World farmers, of course, still harbor illusions that their farm surplus problems can be solved through massive food aid giveaways. Even leaving aside the impact of food aid dependence on the LDC farmers, there simply isn't much demand for food aid these days. Food aid has averaged less than 10 million tons per year in recent decades, and that is a tiny fraction of the First World food surplus. Even during the last big Africa drought, donors managed to get only an additional ten million tons of aid through the pitifully inadequate transport systems of such remote places as the Sahel, western Sudan and Mozambique.

In this age of high-tech seeds and farming systems, there are very few countries that could not produce their own base diets at less real cost than importing grain. First World farm exports really support luxury diets. Thus the true interest of First World farmers should be to stimulate Third World economic growth that will permit billions more consumers to afford protein foods -- even when that economic growth starts with agricultural gains. (Equally important, First World farmers should strive for freer trade in farm products, so that they will have market access for their specialties when Third World countries reach affluence.)

III. LDCs and the Farm Trade Crisis

World Trend Toward Farm Self-Sufficiency

Self-sufficiency has been perhaps the second-strongest trend in world agriculture this decade (behind rising productivity). Over the last decade, increased food production has supported important diet improvements in most of the world's countries, even though the world's volume of trade in grain and soybeans has virtually stagnated.

Many countries have been major growth markets for farm exports in the early stages of their industrial development, when large numbers of non-farm workers suddenly get improved incomes and spend a high proportion of their gains on food and clothing. There has been a tendency, however, for the farm import growth to slow and even reverse later in the development process. Then consumers are already eating and dressing well, so more income doesn't add much demand. Meanwhile, domestic farmers typically have continued to raise their production through new technologies and investments in land and infrastructure.

Western Europe was once a fast-growing market for farm imports, instead of the world's second-largest exporting region. Eastern Europe has shifted from a major net importer to a modest exporter -- and looks fully capable of providing whatever diet improvements its consumers can afford in future years. The Soviet Union has been the only growth market for farm exports in the affluent world over the last dozen years -- and now the Soviets may be joining the trend toward higher crop yields and import displacement.

Countries like Japan and South Korea have been contributing to the self-sufficiency trend by constraining their consumers with high prices and quotas. Even India has subsidized soybean crushers to add non-economic incentives for Indian soybean expansion.

If the world's current rules for farm trade remain in place in the years ahead, we can expect most of the world's nations to continue seeking farm self-sufficiency with all of the power that modern technology and capital can provide. Only the most resource-constrained economies (such as Hong Kong, Singapore, Japan, Switzerland) would fail to achieve it.

East Germany, to offer one example, is currently encouraging short-season corn to displace its corn imports, and a new ultra-high-protein wheat to displace durum wheat imports. East Germany can also use more wheat for its starch production, which not only displaces corn for starch but yields wheat germ as a by-product to strengthen its own soft wheat and reduce hard wheat imports. A new plant has been built to de-hull barley, lowering its fiber content enough so barley can substitute for corn in hog rations. Low-acid rapeseed is substituting for imported soybeans in cooking oil and feed rations.

The European Community has reacted to surpluses of grain and livestock products by heavily subsidizing an eight-fold expansion of its oilseed production. Italy has raised its soybean production from virtually zero in 1980 to 1.3 million tons in 1987 (75 percent of its consumption), and could be

self-sufficient in soybeans within the next two crop years. French pulse crops have expanded eightfold too, with the peas and beans going into livestock feed.

India has subsidized construction of 3 million tons of soybean crushing capacity -- but the country's biggest crop has been 1 million tons even though prices are higher than the world market. The government refuses to import beans, telling the crushers they must find a way to get the beans produced. Were the crushing plants the best use for India's scarce capital?

Much of such import displacement is conducted under the guises of food security and rural development, but most of it is a political response to domestic farm lobbies. Farmers are a strong lobby in every successful economy. Everywhere, farmers are widely seen as hard-working, stable, and family-oriented. Often it has been the increased productivity of these farmers that has just laid the foundation for the country's leap into modernity -- producing a low-cost food surplus that permits urban/industrial growth.

Without the discipline of tough international trade rules, the world's politicians are almost universally willing to seal their borders in response to farmer protests. (Taiwan and Sweden are both currently trying to cut off fruit imports in response to farmer protests.) History also indicates that once such subsidies or trade barriers have been installed, they are terribly difficult to eliminate.

A continuation of the trend toward self-sufficiency would drive down both the volumes and prices in world farm trade, putting a double whammy on farm export earnings. That also has ominous implications for LDC earnings from agricultural development.

Possibility of Farm Trade Reform

The only realistic alternative to the current farm self-sufficiency trend would be a major reform of world farm trade rules. Such a reform would have to be modeled on the GATT rules for nonfarm trade, which forbid such trade interventions as import quotas and export subsidies, and give a strong role to comparative advantage.

Most agricultural experts still believe it naive if not foolish to predict an end to the world's pervasive use of farm subsidies and trade barriers. The pattern has been familiar for more than a hundred years. But there are five major factors forcing farm policy changes:

-- The continuing flows of new technology and off-farm inputs have made it terribly dangerous for any government to

guarantee a price for all that farmers can produce. Rising yields and declining real production costs are the major reasons that the cost of farm subsidies has increased five-fold in the affluent countries since 1970 and doubled in the last decade.

-- Most OECD governments already face budget deficits, so it will be difficult for them to keep farm subsidies at their current levels, let alone increase them.

-- Since the farmer benefits of a given subsidy level are dissipated quickly in higher land values and increased input purchases, subsidized farmers will face gradual decapitalization if subsidy rates don't increase.

-- Export subsidies and import displacement have offered the only national-level solution to the farm surplus-farm income dilemma for most countries. Thus it is no surprise that the international frictions produced by farm protectionism have reached unprecedented levels in the last decade.

-- Trade frictions are also exacerbated by the increasingly competitive world economy for all goods and services, which forces even affluent countries like Canada and the U.S. to seek their real comparative advantages..

Farm subsidy programs are already changing rapidly under these pressures. West European countries have stopped raising price guarantees. The EC has capped prices, and now has production quotas set or proposed for nearly all products. Sweden is charging farmers the cost of exporting their meat surplus. The international frictions have set off a farm subsidy war directly engaging the U.S., the EC and the 14 nations of the Cairns Group. Japan is getting serious pressure from the countries that buy its manufactured exports to open its farm trade barriers. South Korea and Taiwan are facing similar pressures.

Stable (farmers would say stagnating) farm subsidies are probably untenable for both farmers and politicians. But widespread farm bankruptcies are also politically difficult, so farmers and governments are faced with a dilemma.

Import displacement is usually the first reaction to the dilemma, but its costs are very high, both in cash and in trade frictions.

A second possible solution is the farm trade reform proposed by U.S. in current round of the General Agreement on Tariffs and Trade. The U.S. has essentially proposed a ten-year phase-out of all farm production subsidies, and trade barriers. The reform has been basically endorsed by the 14 nations of the Cairns Group of farm exporters. It is probably a more realistic proposal than most other governments and farm lobbyists have conceded, but even the optimists give it no more than a 50-50 chance.

Essentially, reform would give each subsidizing nation ten years to "buy down" inflated farm land values, and help their farmers to a new, lower-cost, rising-sales environment. Governments would remain free to help their small farmers with direct income payments, so long as the payments were not tied to production. The reform would make cheaper food more widely available throughout the world. The biggest sales volume gains for farmers would come from offering lower-cost protein foods to the billions of consumers in newly-industrializing countries who are not yet consuming much protein. Smaller -- but quicker -- gains could be found among the consumers in Japan, Western Europe.

The first farm impacts of trade reform would be lower prices for temperate-zone farm products and lower land values for the farmers currently being subsidized.

Tyers and Anderson did an econometric study for the World Bank suggesting that world farm prices would rise 6 percent with trade liberalization. That result is hardly credible in light of world's huge surplus in farm productive capacity. The world surplus is currently at least 150 million grain-equivalent tons per year, including over 100 million tons in the U.S. cropland diversion program, 30 million tons of subsidized grain and livestock products from Western Europe, the land planted to sugar beets in the OECD countries, 2 million tons of Japanese rice and wheat, and 2 million tons of Saudi wheat. Prices must come down to balance demand with supply -- partly by discouraging noneconomic use of purchased farm inputs and partly by encouraging more consumers to add more high-protein foods to their diets.

The farm management context in the affluent countries would then quickly shift from "maximum yields" to "lowest out-of-pocket costs." Virtually all of the cropland and farmers currently in agriculture would stay in farming, because that is where their comparative advantages lie. Farm production -- and costs -- in the OECD countries would decline, however, as land values were written down (presumably with generous government transition payments) and the heavy use of purchased inputs was discouraged.

The second big short-term impact of farm trade reform would be increased farm exports for LDC farmers, especially for sugar and red meat. The land currently planted to beet sugar in the OECD countries would be shifted to temperate-zone crops, most of it for production of meat, milk and eggs. (Grain, oilseed, pulse and legume crops are the most likely.) Cane sugar producers could expect a 60 percent increase in their sugar exports in a fairly short time frame. Subsidized exports of livestock products would also disappear, probably opening

export opportunities for sales of cattle, sheep and goats from Third World pastures.

In the longer term, lower real costs and continuing research could broaden the definition of "farm product" to include industrial raw materials such as organic chemical feedstocks, cellulose, and perhaps even cost-effective ethanol. Meadowfoam offers an example of a potential industrial crop, producing a unique long-chain fatty acid that apparently can provide lubricating oil with exceptional performance at high temperatures and pressures. It should be useful in the high-value oil-additive market where lubricants sell for up to \$50 per pound. If costs can be low enough, it could even penetrate the diesel and automotive oil markets. The economic gains from cropping currently-idle land could be enormous.

IV. Implications for LDC Agricultural Development

LDC Agricultures Almost Certainly Face Lower Prices

Agriculture has long exhibited the classic declining trend in real prices, but a much sharper trend of decline in farm export earnings is in prospect for the next few years. If world trade rules are not reformed, LDC agricultures face a continuation of world farm self-sufficiency that will cut export demand and drive down both prices and sales volumes for those farm products which seek buyers in the world market. If world trade rules are reformed, LDC farmers can expect lower prices, and would also have to face import competition in their own domestic markets. However, they would gain opportunities for sharply increased export sales volumes in the commodities they produced most efficiently (and thus with the highest profits). Clearly, neither of these scenarios is ideal for LDC farm development, but reform would be far more advantageous to both agricultural development and nonfarm economic growth than national self-sufficiency.

The virtual certainty of continued low farm prices has enormously important implications for agricultural development aid. It means that LDCs must continue to seek the lowest possible production and infrastructure costs if their agricultures are to expand successfully. Thus a continued emphasis on land-enhancing farm technologies with low out-of-pocket costs will be necessary. There is not likely to be a significant "commodity boom" or "price recovery" that would give LDC governments or corporate investors a surge of ready cash to finance growth investments in new land development, groves, storage silos or farm-to-market roads. Such investments will have to be wrested one at a time by the farmers and businessmen of the country through their own labor, savings and investment.

LDC agricultures will have to continue their search for cost-effective ways to increase the economic contribution of their agricultures. They will retain their advantage in relatively low land and labor costs, along with their disadvantage in undeveloped infrastructure. They probably will continue to get relatively bigger yield gains from such research breakthroughs as new seed varieties, but suffer from the fact that they get fewer of these breakthroughs than most developed-country farmers and have more trouble exploiting them because of infrastructure constraints and the lack of well-developed market demand.

Perhaps even more important, lower prices mean that raw commodity exports will be somewhat less effective as engines of economic growth in the decades ahead. Instead, the key agricultural contributions to growth will be adequate nutrition (and thus political and economic stability), low-cost wage goods for non-farm workers, and low-cost industrial raw materials for labor-intensive industries (Examples: cotton and other fibers for textiles, leather for shoes and other leather goods, and sugar and fruits for confections.)

LDCs will continue to face the need for reform of the national policies and priorities that have discouraged so many LDC farmers in the past: parastatal control of support functions with poor performance and high costs; overvalued exchange rates that made food imports seem cheaper than they really were; failure to recognize the enormous long-term profits that accrue to national farm research programs; food prices set at low levels to favor urban consumers, rather than at levels which would call forth enough production to meet effective demand; uncertain land tenure; tax policies that discouraged private savings and investment, especially for such key infrastructure investments as storage and processing facilities.

Even if the GATT farm trade rules are reformed to eliminate export subsidies and give LDC agricultures access to more consumers in the future, any gains in sales volume and earnings will have to be won in intense competition with other LDCs and developed-country farmers. (Virtually all of the arable land in the OECD countries would remain in farming, and the U.S. cropland diversion program that in 1987 idled 28 million hectares would presumably end.)

IV. Aid Success Lessons

Forty years of agricultural development experience all over the globe have provided some important lessons on how agricultural development aid should be shaped for greater effectiveness in the future whatever the trade context.

There is no question that development aid's biggest agricultural success has derived from fostering agricultural research. Every nation in the world by now should have learned that agricultural research investments pay enormous dividends. Development aid's first achievement was the set of international farm research centers now known as the Consultative Group on International Agricultural Research (CGIAR). CGIAR's first achievement was a Green Revolution that has never stopped.

The world knows that agricultural research should be amply funded in developing countries, since even ample research funding costs far less than food imports, farm subsidies, or even smuggling. If farm prices are to continue their decline, then research will be more important than ever to lower the real cost of farm products for wage goods and raw materials. The research program should be stable, since it is extremely difficult to build effective research institutions on an erratic basis. The research program should be free from political bias and controls; it should be equally free to pursue the most promising scientific possibilities from the standpoint of the LDC itself, rather than following such fads as "mechanization", "small farmers", or even "appropriate technology."

International farm research successes are almost certain to continue. The international institutes now have more researchers, working in more countries from a broader base of knowledge, and using better tools than ever before.

The second largest success of the international agricultural development aid has been the training of research professionals to staff national research programs. These training programs probably have not have transferred much specific technology, but they have transferred enormously important scientific skills for application in the trainees' home countries.

One example is all it takes to demonstrate the breadth and diversity that has keyed the success of the international farm research and training networks: The breakthrough sorghum hybrid for Sudan (and perhaps much of East Africa) was bred by an Ethiopian plant breeder, with a Ph.D. from Purdue, working in Sudan under the auspices of ICRISAT, using parent lines from Texas and India. The new sorghum is not only much higher-yielding than traditional cultivars, but far more drought-resistant as well.

(The point should be made that developed-country agricultures have probably gained enough new knowledge and

genes to amply compensate for the research funding the First World has provided.)

There is virtually no question that agricultural development aid programs for the future should be keyed to the successes in research and training. However, these two programs account for a relatively small proportion of past aid activities and funds.

The big question is what development aid's failures say about the future directions for broader development success.

It is probably no accident that the international research and training programs are the activities that depended least on the weak governmental, scientific and economic institutions that are characteristic of LDCs. (Countries with strong institutions in all of these areas typically cease to be LDCs fairly swiftly.)

The national programs of agricultural research that should support and extend the work of the international centers unfortunately offer no success story to parallel CGIAR. A few strong national research programs have emerged (Brazil, India, and increasingly, Indonesia). (China also qualifies as a national research success story, but it has received virtually no agricultural development aid in the period relevant to this analysis.) Hardly an LDC government has yet tried to tap for its farmers the benefits that go to "early adopters" of new technologies.

To a distressing extent, the huge funding provided for a wide variety of other development programs and resource transfers has produced few benefits. The programs have produced no discernible increases in development rates. In too many cases, the aid programs have actually legitimized institutions and policies that did not deserve it, and funded activities which actually hampered farmers and agricultural development. A few obvious and generally-agreed examples seem necessary to undergird this point:

-- Soviet support encouraged the Mengistu government in Ethiopia to focus its agricultural development efforts on state farms. The state farms got the research-improved seed and the available fertilizer -- and still achieved lower yields than the peasant farms using traditional technology. The country remains today hostage to every vagary of a harsh climate.

-- The World Bank made major resource transfers on the basis of its ill-fated Basic Human Needs concept, which intended to help the "poorest of the poor" but which too often targeted places and activities with poor development potential, at least for the short and medium term.

Farmers in most LDCs remain at the mercy of overstuffed, undermotivated parastatals for their support functions. In Morocco, I was told that the fertilizer agency sometimes didn't get its product to the farther corners of the kingdom. In Sudan the cotton inputs often haven't arrived until after the planting season, even though cotton has been the country's major source of foreign exchange.

Corruption is a way of life for too many governments and government officials. More than one country's governing political cabal is funded directly from the farmer's market receipts. Urban elites have dominated too many government-to-government aid programs, siphoning off the employment and benefits that should have gone to rural areas, effectively stopping rural growth.

Perhaps the key remaining policy constraint in the whole Third World is a lack of really pro-competitive economic policies. Too many countries say, "We already have two coffee exporters, why do we need to license more exporters to feed off the blood of our farmers and produce price chaos." But having only two licensees leaves the exporters with too little incentive to offer growers the best price, cut processing costs, absorb storage risks and find new customers overseas.

Hernando De Soto's 1986 book on the Peruvian informal economy (El Otro Sendero) graphically documents the shortcomings of Peru's over-regulated formal economy. De Soto found, for example, that it took 289 man-days, 24 bribe solicitations, and two bribes to legally open a two-sewing-machine "clothing factory." The same process in Miami took four hours. No wonder that the "illegal" sector provides most of the jobs, housing and services for the city of Lima. No wonder the Peruvian economy has so little power to pull its people out of poverty. No wonder it has been difficult to get adequate support services for Peruvian farmers, or build consumer markets for high-value foods.

Aid funds provided part of the support for De Soto's ground-breaking research work. Is there a next step for development aid in making sure that enough additional licenses are issued to insure competition in support services for Peru's farm sector? Would that approach work in other countries?

Dr. Anne Kreuger, late of the World Bank, recently told a State Department audience that debt has been less of a growth constraint on Latin America in the 1980s than inadequate economic reform; she characterized the economic reforms that have been made as "palliative."

It is no indictment of development aid to say that it has failed to transcend the constraints of anti-growth environments

in many LDCs. Nor is it an indictment of particular countries or cultures. The young United States had a weak government under the Articles of Confederation; it took us decades to draft and adopt our Constitution. British investors in our early canals and railroads found to their sorrow how quickly their capital could disappear in America's new and thus high-risk frontier economy.

If development aid is to have a future role in the Third World's development, however, it must find better ways to make impacts in countries with weak institutions and cultural patterns not yet adapted to taking full advantage of modern economic growth potentials.

The World Bank still talks of bravely of "keeping resource transfers flowing" despite strong evidence that no good comes from pouring money, goods and services into economies that cannot absorb them and put them to constructive use. Too often, even appropriate investments are overwhelmed by the negative context surrounding them.

LDCs themselves have often taken aid grants as tributes to their political importance rather than as true development assistance. Few LDCs have welcomed the recent trend among donors toward aid conditioned on policy reform, and relatively little policy reform has yet been produced.

Perhaps it is time to re-think the linkages between aid and recipient governments. Virtually all development aid has been channeled non-competitively through those governments. Recently we have gone so far as to award some aid competitively between governments, on the basis of their relative willingness to make needed economic reforms. Can we constructively go farther? Can we direct more aid through other types of institutions where a competitive environment and greater incentives for effective development can be fostered? What about aid relationships with institutions close to the rural resources than the national governments? The World Bank recently made a loan to a forest products firm in Guyana which it concluded was a more effective loan recipient than the government. The Bank simply made it clear that the government's choice was between a loan to the company and no loan in the country at all. What about loans or grants to farmer cooperatives (not government-established shells but living cooperatives actively run and owned by the producers)? What about loans to tribes, villages, or regions? Charitable organizations? Seed multiplication companies? Grain storage firms? Even exceptional individuals with special skills and opportunities?

Obviously, such a change in lending and development aid programs would mean some significant changes in the programs and their administration. It would probably mean smaller projects, depending less on central administration. It would mean a much less cozy relationship with the recipient national governments. Instead of trying to shift large amounts of resources to recipient governments, the new focus might be a "seed money" to stimulate savings, investments and sweat equity by millions of rural individuals.

Such a new approach might mean heavier reliance on grants, less administrative stress on monitoring how the money is used in the short term, heavier stress on producing results.

Such a shift would of course involve a different concept by donor governments, too. Donor countries often target their aid on the basis of political commitments (U.S. aid to Egypt, EC aid to former French colonies) rather than targeting it on the best economic development prospects. Donor countries often give aid designed to increase their trade prospects with the LDCs involved.

Maintaining past illusions in both donor and recipient countries has yielded a slow pace of development progress, with a great deal of wasted money and effort. In fact, if the limitations of past development aid are not overcome, the whole aid effort may be threatened by public apathy and competitive hostility. For the sake of the development effort, the people it could help directly, and the well-being of the whole world, we need to do better.

. 19

Bibliography

Anderson, Kym, and Tyers, Rodney, Agricultural Policies of Industrial Countries and Their Effects on Traditional Food Exporters, Working Paper 86-4, Department of Economics, University of Adelaide, Adelaide, Australia, June, 1986.

Anderson, Kym, Does Agricultural Growth in Poor Countries Harm Agricultural-Exporting Rich Countries?, Department of Economics, University of Adelaide, Adelaide, Australia, May, 1987.

Avery, Dennis T., "The Global Bad News is Wrong," Science, Vol. 230, October 25, 1985.

Avery, Dennis T., Rising World Food Self-Sufficiency: Temporary or Long-term?, State Department INR Report 1215-AR, December, 1985.

Avery, Dennis T., Agricultural Analyst, Bureau of Intelligence and Research, U.S. State Department, Statement to the Senate Subcommittee on Foreign Agricultural Policy, June 3, 1986.

Ranis, Gustav, A Comparison of the Import Substitution Experience of the Philippines and Taiwan, unpublished external research paper, Bureau of Intelligence and Research, U.S. State Department.

Rask, Norman, Economic Development and the Dynamics of Food Needs, Department of Agricultural Economics, Ohio State University, Sept., 1986.

Schuh, G.E., Policies and Incentives for Agricultural Production and Investment: Policy Reform in Sub-Saharan Africa, International Bank for Reconstruction and Development, Washington, D.C., undated.

Sanderson, F.H., Long-term Prospects for U.S. Agricultural Exports, National Center for Food and Agricultural Policy, Resources for the Future, Washington, D.C., June 3, 1986.

World Development Report 1986, The World Bank, Washington, D.C.