

PN-ACZ-460

# War on Hunger

*A Report from The Agency for International Development*



SEPTEMBER-OCTOBER 1977

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*A Report from The Agency for International Development*

John J. Gilligan, AID Administrator  
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**COVER:** A young boy tills a field in an area where desertification is rapid.

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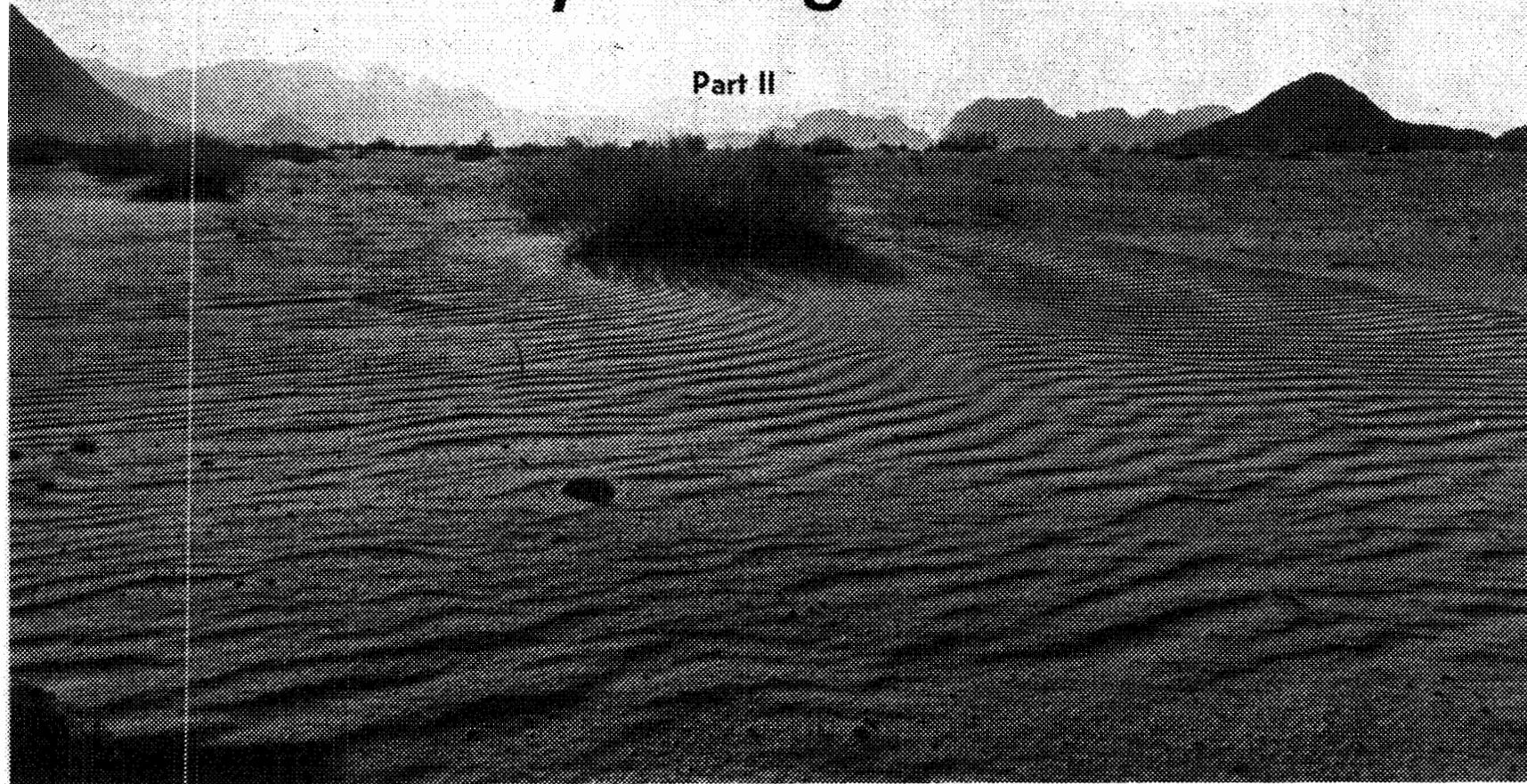
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## **CORRECTION:**

In the July issue, a typographical error appeared in the article "Water: A World Problem." The article stated that 19 countries attended the U.N. Water Conference. It should have read, ". . . delegates from 119 countries . . ." We regret this error and hope that our readers were not misled by this error.

# The Spreading Desert

## Part II



**By Erik Eckholm and Lester R. Brown**

Although minerals, tourism, and commerce sustain some inhabitants of desert lands, most people in less-developed arid countries make their living from agriculture. The vast majority either grow their own food or sell or trade their crops for food and money. Unfortunately, many desert countries have fallen far behind the world as a whole and even behind many other poor countries in efforts to boost food output. Judged strictly on the basis of national per capita production data, which do not reflect the unequal distribution of food within countries, desert lands appear to be in deep trouble. Add in the unequal distribution of income and the picture grows grimmer.

Desertification both reflects and contributes to the poor food-production record of the arid countries, and its potential influence on their food outlooks necessitates a broader examination of food-production prospects in the desert lands.

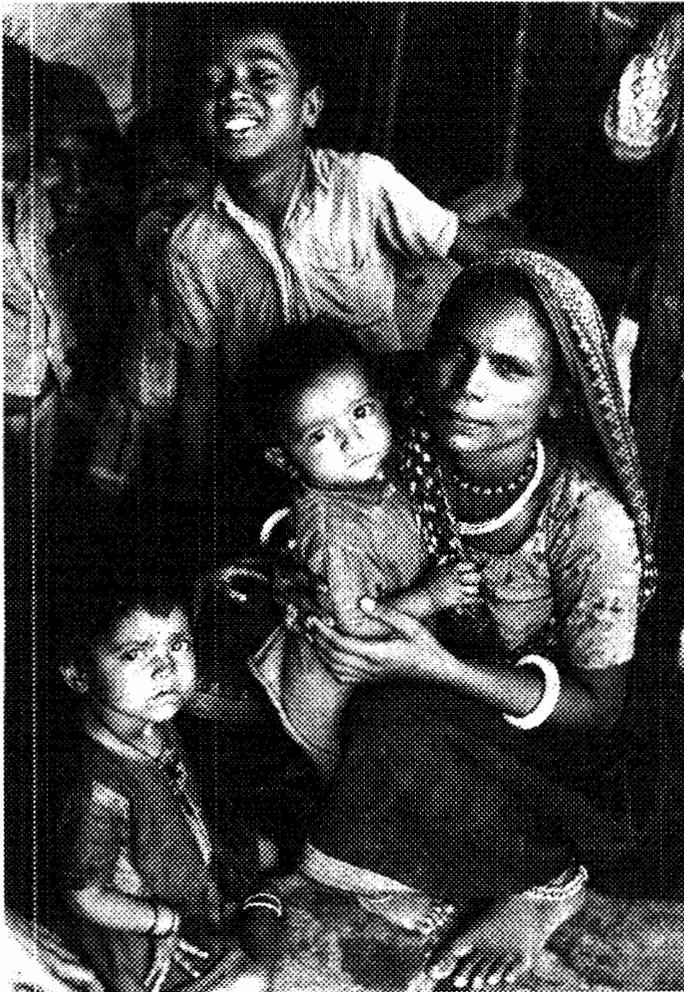
Worldwide, grain production doubled and world population increased by nearly two-thirds between 1950 and 1975. Hence, global grain output per person rose by more than a third over the last quarter century. Few of the desert countries, however, shared in this progress. In fact, per capita grain output fell during this period in many. If data from 16 predominantly arid or semi-

arid developing countries that lack widespread irrigation is analyzed, a clear pattern of retrogression emerges.

Only two of the sixteen countries, Senegal and Sudan, boosted per capita grain output significantly. By irrigating and cropping more land, these two countries overcame the effects of marked land degradation in some of their regions and nearly matched the average global improvement rate. In two other desert countries, Iran and Libya, grain production per person held its own over the last quarter century. But in the remaining 12 countries, per capita grain output declined. In some cases the decline has been modest: but in Algeria, Iraq, Jordan, Lebanon, Mali, and Niger, per capita production fell by at least 40 percent between the periods 1950-52 and 1973-75. In none of the countries showing declines has much grain-producing land been shifted during this interval into non-food crops—a shift that would explain the fall. In some, however, sizable areas are devoted to export crops such as cotton or peanuts.

When per capita food output within a country falls, consumption falls commensurately (with declines usually rationed not by need but by income), imports rise, or both. While data on the actual food-consumption trends among various income groups within the desert countries are not available, evidence of chronic and widespread undernutrition among the poor can be found in nearly all. Moreover, an increase in the dependence of many of these countries on outside food sources is readily documented.

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*The larger the family, the harder a farmer must work his land to grow food.*

Due to poor national food-production records (and, in a few countries, soaring net incomes accruing from oil wealth), net grain imports into these 16 countries have more than tripled over the last 15 years, rising from an annual average of 2.5 million tons in 1961-63 to an average of 7.6 million tons in the years 1975-77. Algeria and Lebanon already import half or more of their total grain supply, as does Saudi Arabia (a desert country excluded from the list because data on its grain production is inadequate). Despite its intensive irrigation development, Egypt is also growing heavily dependent upon grain imports.

While different arid regions have different agricultural prospects and potentials, desertification generally reduces present and future food production wherever it occurs. It undercuts the benefits of agricultural investments and can create poverty-producing wastelands even in countries that, by aggregate national statistics, appear to be making rapid agricultural gains. Concentrating investments in "choice" areas and development benefits in the hands of a privileged few can give a country a veneer of progress that blocks widespread environmental deterioration and social disintegration from view.

The state of underdevelopment itself usually indi-

cates the presence of resources and productive potential now wasted. In a number of desert countries, for example, water resources are far from fully exploited. At the same time, the physical availability of underground or river waters cannot automatically be equated with irrigation potential; sometimes the costs of water development outweigh the resulting benefits. Furthermore, waterlogging, salinity, and the spread of water-borne diseases are built-in perils of irrigation in arid lands. Recent rice projects in West Africa, for example, have created new habitats for schistosomiasis parasites.

Beyond unused irrigation potential, arable lands remain unplowed in a few desert areas. Fertile areas are being opened to farming, for example, as a result of the current international campaign against river blindness (onchocerciasis), fear of which has kept portions of West Africa's river valleys unoccupied. In other desert regions, however, such as Northwest India and many parts of Africa and the Middle East, farming has already been extended to areas where rainfall is fickle and soils are highly erosive. Good husbandry in these areas will, if anything, require reducing the cropped area.

In the wake of the Sahelian drought and other tragedies of the early 1970's, development specialists rightly focus their attentions on the unexploited food-producing potential of the arid zones and on the possibility that some now-deserted areas could become breadbaskets. Even as the reforms and investments essential to such development are identified and implemented, however, some basic influences on the future food situation in desert lands must be kept in mind.

Most of these lands will never be irrigated and, while substantial production gains could be realized in many desert countries, no technology within sight could sustain progress in dryland grain farming comparable to that enjoyed in moister zones in recent years. Research priorities within the arid zones have been skewed toward the development of profitable export crops, and, until recently, worldwide research efforts have reflected mainly the needs of farmers in temperate zones. But more fundamental constraints on dryland yields may exist; heavy fertilization is productive only when soil moisture is high. Even in the United States, the average yield of wheat—which is grown mainly on semi-arid lands—has increased by only two-thirds over the last generation while the per-hectare yield of corn—which is grown mainly where rainfall is abundant—has tripled. No less skilled or progressive than the Iowa corn farmer, the Kansas wheat farmer must simply work with drier soil. Indeed, wheat yields have risen by scarcely a third in recent decades in Canada and Australia, two other agriculturally advanced countries that produce wheat under dry conditions. In contrast, where wheat is grown under high rainfall (as it is in Western Europe) or under irrigation (as in Pakistan and Mexico) impressive advances have been achieved.

Demography as well as production influences the

food outlook in desert countries. Although undernutrition mainly results from the maldistribution of income rather than an absolute shortage of food, its extent can easily multiply if population growth far outpaces agricultural growth. Sometimes, a whole nation's economic progress can be undermined as foreign exchange is soaked up by rising food imports.

Populations in many arid regions have, in the context of the technologies in use there, already reached the ecological danger point—as the breakdown of traditional fallow cycles and the spread of desert-like conditions make all too clear. In the arid, over-grazed areas directly on the fringes of deserts, populations must be stabilized soon if further disaster and desertification are to be skirted. As Australian demographer John C. Caldwell writes of the Sahelian zone nomads, "their way of life is, without question, being imperiled by their growth in numbers."

Some observers conclude that population growth in the more potentially productive semi-arid farming zones is not an important issue since considerable production gains could be achieved on these lands using known technologies. What those who so reason overlook is the tremendous demographic momentum created by the extremely high birth rates and the predominance of

young people in many desert countries today. In eight of the sixteen desert countries analyzed, populations are now growing at three percent or more annually—a growth-rate that, if sustained, would bring population increases of nineteenfold or more within a century.

Small families do not usually become the norm unless the social and economic climate is such that parents perceive an economic advantage in fertility control and unless most children live to become adults. Yet, in the desert countries, as elsewhere, simply to wait hopefully for development to precipitate a fall in the birth rate is to court ecological disaster as well as to jeopardize the health of the millions of low-income women without access to family planning services. Even in a context of rapid and equitable economic development, the demographic transition to smaller families is likely—in the absence of special efforts to reach people with family planning services—to take decades or longer. Unfortunately, however, the desert countries have as a group been singularly slow to implement the goal agreed upon at the 1974 U. N. World Population Conference—providing all people with the knowledge and the means to plan their families.

Brightening the food prospects of the desert lands will require arresting and reversing desertification rap-

*Terracing helps make a little land go a long way in hilly country and arid areas.*



idly. It will entail implementing rural agricultural reform and distributing the fruits of development more equitably. It will also require slowing population growth. In the absence of such progress, economic and nutritional deterioration in many desert countries will continue. If it does, those individuals and countries who can afford it will buy their food on world markets; others will make do as best they can.

An ecological phenomenon, desertification is a human problem. People cause it, people suffer its consequences, and only people can reverse it. Any schemes for enhancing the productivity of desert lands must, therefore, be grounded in an understanding of the cultures and economic predicaments of desert dwellers and in the recognition that people undermine their own futures only when they see no alternative.

In the present institutional context, what is essential to the short-term survival of the individual who lives on arid lands often flies in the face of what the long-term survival of society dictates. For example, nomadic families or clans need large numbers of animals just to meet their basic needs for milk and milk products, generally their principal foods. To these people, surplus animals represent an investment. They also provide "drought insurance." When the rains fail, some animals can be sold off quickly, and, since some animals

*A nomad admires the vegetables he has grown; farming is new to the nomads.*



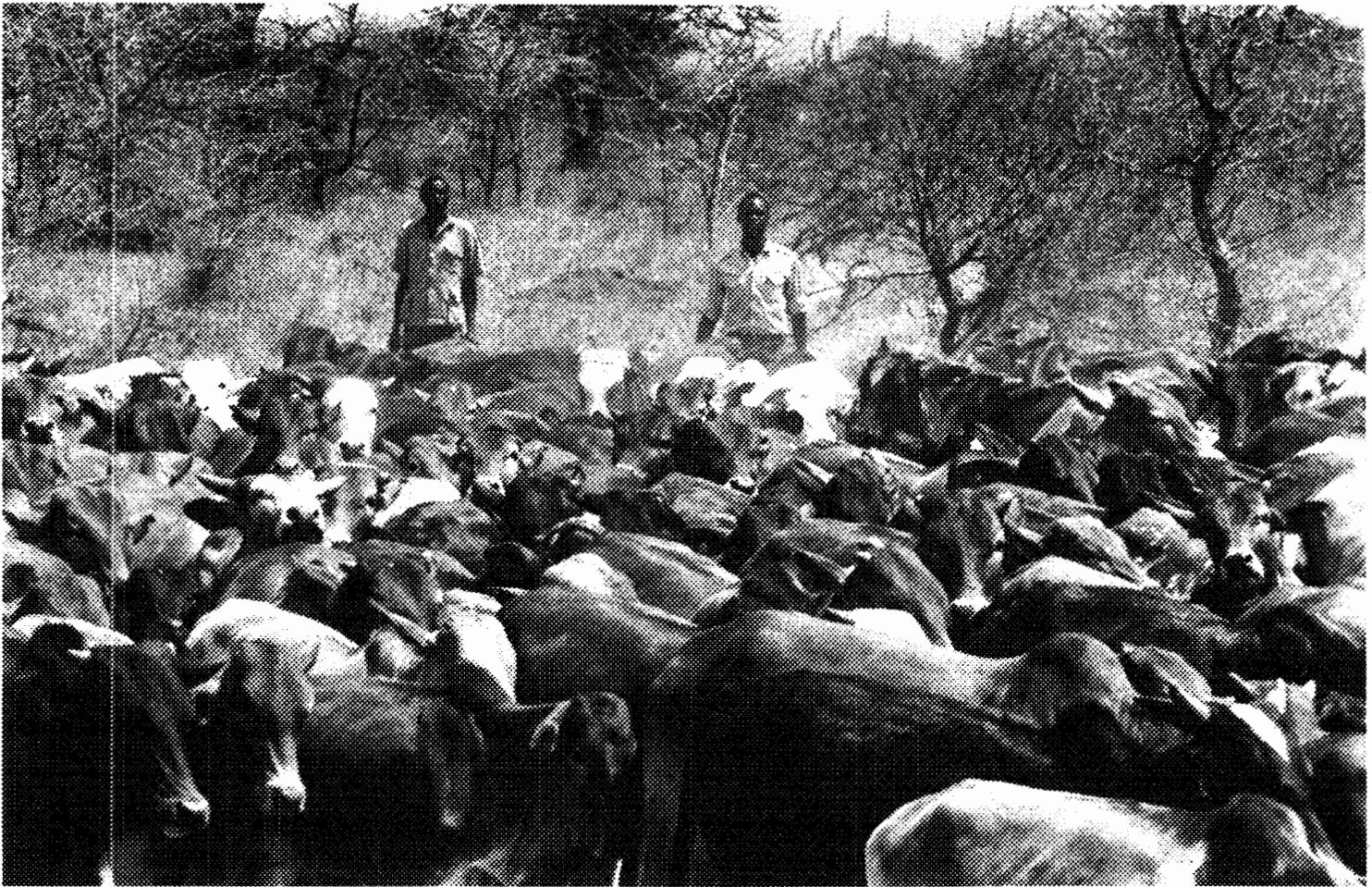
are bound to die during a drought, owning a large herd is protection against a total loss. Similarly, the individual farmer may have little choice but to plow up high-risk marginal fields. Yields on the better farmlands may be inadequate to feed the local populace and may even be falling as population pressures or the extension of cash cropping undermine traditional fallowing customs. Moreover, individual parents in desert lands naturally place a premium on large families because family deaths are frequent and extra children are needed to tend herds, gather wood, and carry water.

A better future for the people of the arid lands, then, depends upon forsaking a system in which the exercise of personal aspirations encourages social suicide for one in which those working to better their own lot are also furthering the long-term welfare of society. Livestock will have to be valued for its quality rather than its abundance, farmers will have to be supplied with the knowledge and equipment they need to grow enough food for all on the best-suited lands without running down the long-term fertility of this land, and the advantages of small families will have to be apparent to all couples.

A successful new order along these lines will almost certainly involve economic cooperation between those in the arid zones and those in cities or in regions with more moderate climates. An inward flow of resources, information, and goods to the desert edges is essential to a new order there; equally essential, in turn, is the outward shipment of meat and other agricultural products. But such cooperation must be based on a more just division between and within regions of the benefits of trade than has usually been made. Additionally, exports from the desert lands—which can provide the resources needed for economic development—must coexist with, rather than replace, a self-reliant, equitable, and environmentally sound food-production and distribution system.

Faced with the compelling need for a radical transformation of life on the desert margins, some analysts oversimplify and fail to address the fundamental predicament. Some governments, seeing the deterioration of grasslands, are determined to settle nomads at almost any cost. Watching the ubiquitous goats destroy trees, shrubs, and grasses, a few ecologists advocate killing off this hardy, well-adapted animal in arid lands. As water becomes scarce, local leaders demand that national governments or international aid agencies dig wells, but are unwilling to control the size of local herds and their access to the pastures surrounding a new well.

In the desert, as elsewhere, planners have much to learn from the plants, animals, and cultures that have withstood centuries of extraordinarily adverse environmental condition. If the ecological balance historically maintained by most nomadic groups was rather wretched, predicated as it was on high human death rates, these people used the life-defying desert remarkably resourcefully. In popular mythology, nomads are



*Reduction of herd size is imperative to prevent desertification. Cattle eat what little vegetation is available. By reduc-*

*ing herds considerably, more semi-arid land can be saved from the desert.*

often pictured as aimless wanderers, when, in fact, nomadic movements nearly always harmonize with the seasonal rhythm of climate and plant life. They are geared to permit animals to find adequate forage throughout the year and to permit the regrowth of grazing lands.

A return to an earlier historical age is no more desirable than it is likely. The harsh system of natural selection that characterized nomadic systems in the past is no longer ethically acceptable today. In any case, rudimentary, modern medicine has trickled into the arid zones well ahead of advanced agricultural technology and has helped push down death rates. Moreover, national boundaries now divide natural ecological zones artificially and restrict the traditional movements of nomadic groups, while the spread of sedentary agriculture further limits migrations.

In an effort to keep the nomads from being squeezed into the desert, the government of Niger in 1961 set a northern boundary of legal cultivation. But the northward advance of farming, set back only temporarily by the years of severe drought, has continued all the same. Today, farming takes place on sites at least 100 kilometers past the legal limit and is practiced illegally in the protected zone by both nomadic groups and others moving up from the south.

Although many traditional nomadic practices are no longer viable, adopting some modernized version of the nomadic way of life may be the only way that those in the arid desert fringes can safely exploit these areas' protein-producing potential. Huge regional management schemes, in which clan leaders regulate grazing and migratory movements according to natural conditions and the advice of range specialists, are one possibility. Such a system would ideally retain much of the flexibility of nomadic ways while also permitting the application of modern methods to improve livestock quality. Once grazing was under control, wells and pasture improvements could be introduced with less chance that their long-run impact would be twisted.

More specifically, one possible approach would be to establish large herding cooperatives of the sort Jeremy Swift, a British specialist in pastoral development, has proposed for Somalia. Cooperatives could combine ecologically sound management with both economic progress and social security for the nomads.

According to Swift, "Pastoral cooperatives would be an appropriate form of organization to take on some of the functions of traditional pastoral society, such as the regulation of grazing, security against loss of animals, regulation of conflicts over land use, and making investments in the land. Pastoral cooperatives would

also be an appropriate vehicle for taking the state to the nomads and for making their views and wishes known to the state, a channel of two-way communication that is needed particularly during a phase of rapid transformation of the sort now starting in Somalia."

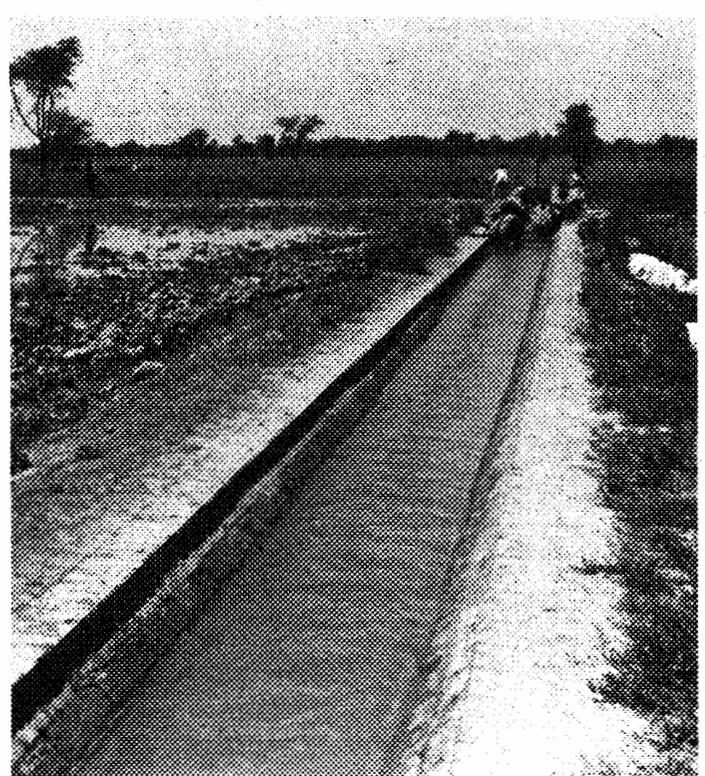
A key to the success of any livestock scheme is the reduction of herd sizes. According to some specialists, the number of grazing animals maintained in the Sahel up to 1972 and 1973, as the lengthy drought reached its climax, was at least double what the zone's ranges can sustain without damage. The drought cut animal numbers steeply, but not enough to put grazing and grasses back into balance. Yet numbers deceive: if animal numbers were maintained at *half* the 1971 level and modern management techniques were implemented, the region's output of meat and milk could easily be *double* the 1971 level.

This somewhat paradoxical formula reflects the nature of livestock growth. Roughly half the food consumed by a grazing animal is required just for physiological maintenance; another fourth is required largely for reproduction, and the final fourth goes into milk production, growth, and fat storage. Any cutback in feeding forced by the depletion of pastures is mostly at the expense of these final functions. Of course, the benefits of a more efficient grazing system that emphasizes productivity over herd numbers can be realized only if valuable livestock products are at the same time put within consumers' reach. Herd reductions will be permanent only if the people involved understand the need for change, participate in the decision-making process as change is carried out, and see a genuine opportunity for a better life in the new order.

Improving farming in the sedentary zones is as crucial to arresting desertification as controlling grazing is. Agricultural progress is essential not only to provide food, employment, and income to the mounting populations of these areas, but also to halt the destructive spread of cultivation onto pasturelands. In past decades, most research and investment in arid-zone agriculture pertained to the production of cash crops like cotton and peanuts for export, or revolved around large-scale irrigation schemes intended to bring desert regions under intensive production of food or fiber. Simple subsistence farmers, growing millet or sorghum for family consumption and trade with nomads or urbanites, have frequently been neglected.

As political scientist Michael F. Lofchie describes the situation in Africa, "Decades of over-concentration on export cultivation have left the continent's food-producing regions badly under-supplied with infrastructure, deprived of government services, desperately short of capital for development, and technologically pre-feudal. As a result, any attempt to improve Africa's food-producing capability will need to concern itself with a fundamental structural transformation of the rural economy."

However, as Lofchie goes on to note, shifting governmental priorities toward food crops and extending



*Irrigation programs bring precious water to arid areas, and help prevent desertification.*

the benefits of the development process to more people involve more than technical decisions: "Policies which have the potential to undermine the established economic primacy of the export sector would run directly counter to the large and powerful array of social groups which have a stake in the profitability of the export economy."

Export crops, a principal source of foreign exchange for many arid countries, can be one key to economic progress. But if their expanded cultivation is not accompanied by careful land-use planning, and if a major share of the income they produce is not earmarked for the betterment of rural economic and social prospects, the lot of the rural poor may deteriorate and environmental stresses intensify. All too often, the foreign exchange and taxes collected from export crops wind up mainly supporting bloated government bureaucracies and the luxurious lifestyles of the urban elite.

In many dryland farming areas, population growth prohibits a return to the ecologically sustainable fallow or rotation systems once used with success. The only alternative is to adopt new cropping systems that minimize erosion and employ crop rotations, water-conserving techniques, animal manures, green manure, and, where moisture permits, chemical fertilizers. Such anti-desertification agricultural methods have been developed and proved effective in Israel, Australia, the Soviet Union, the United States, and other countries. Indeed, their use could be enhanced if agricultural technologies and experiences were exchanged among developing countries—a generally neglected form of potential technology transfers. Near the city of Kano in semi-arid



*Farming is a family affair in many countries. Women and children join their husbands in the fields. Better farming*

*techniques are needed to ensure that family farms utilize the land in the most efficient manner.*

northern Nigeria, for example, ecologically sound methods of continuous cropping that involve the heavy application of human and animal wastes to the fields have evolved, and these practices could well prove workable in other areas.

As agricultural modernization is pursued, governments and aid agencies need to watch carefully the evolution of land-tenure patterns and to insure that the social goals of development are not undercut by the concentration of landholdings and production benefits in the hands of a few. Land in many arid regions is still allocated by traditional tribal criteria, but as land becomes more scarce or when its value suddenly jumps after it is irrigated, traditional tenure patterns begin to break down. If "development" entails the emergence of huge mechanized, irrigated farms owned by wealthy individuals or corporations—as it now does in arid northern Mexico—then the welfare of large numbers of people may actually be worsened under the guise of "progress."

In addition to improved agricultural methods, tree-planting programs are urgently needed nearly everywhere that dryland agriculture is practiced. In the U.S. Great Plains, the thousands of windbreaks that were planted during and after the 1930s helped stabilize a system that once threatened to become a permanent dust bowl. Besides reducing wind erosion around fields and, in some circumstances, stabilizing sand dunes, tree-planting programs can also help relieve the critical shortage of firewood for cooking that now plagues every

arid region in the developing world.

A major goal of arid lands development must be to prepare people and economies to live through the inevitable droughts without traumas. Famines in the deserts are not simply climatically-induced disasters; they are social phenomena, resulting when climatic extremes affect vulnerable populations. Accordingly, as populations in drought-prone areas grow in the absence of widely shared rural development, the number of people susceptible to famine grows as well.

Improving local grain-reserve facilities in desert regions can help tide people over during years of poor rainfall, just as better crop-surveillance and reporting mechanisms can expedite the flow of outside aid to regions where crops fail. However, populations cannot be protected against famine over the long run unless everyone shares in the benefits of agricultural modernization and unless the development process creates employment opportunities for all. When only some members of society enjoy rising prosperity and economic security, others who lack access to land, improved technologies, or jobs may starve at the whim of "nature." Hence, protection against famine is not a simple technological problem; its success depends upon the broad shape of national development and the character of prevailing socio-economic institutions.

A problem as awesome as desertification has not gone unnoticed by scientists, by directly affected people, and by some governments. For decades scientists have warned that disasters were brewing in the deserts; but

their warnings failed to spur the political changes essential to solutions. Individuals who have witnessed environmental deterioration and have felt its impoverishing impact on their lives have had no choice but to act in the interest of their own survival. Probably every national government in the desert areas has sponsored programs to combat one or another aspect of desertification. Most such efforts, however, have been too scattered or too weak to reverse widespread degradation.

Some striking success stories do exist. Much of Israel's Negev Desert, which has suffered thousands of years of overgrazing and deforestation, is now productive and prosperous as a result of innovative irrigation practices, improved dryland farming, and controlled grazing. China, which, like Israel, has been uncommonly successful at mobilizing people to accomplish common goals, has halted deterioration and boosted productivity in many of its huge desert areas. Algeria, Iran, Somalia, and Sudan are among the countries that have recently initiated large-scale programs to restore their environments. Plans are now being laid for an internationally funded region-wide agricultural development program in the Sahelian countries of West Africa.

It has been well established that massive efforts to protect and enhance the productivity of the world's arid lands make good economic sense. By U.N. estimates, cumulative degradation of rangelands and non-irrigated farmlands has reduced their combined annual productivity by more than \$12 billion below its potential; if damages due to waterlogging and salinity are added, the yearly losses total nearly \$16 billion. Fortunately, as Harold Dregne, a leading analyst of arid land agriculture, has emphasized, few of the degraded areas have passed the point of no return. In most, wise management can restore most if not all of the land's productivity. Furthermore, according to U.N. calculations, anti-desertification investments in the \$400 million-per-year range worldwide would yield a handsome financial return.

Both the costs of desertification and the benefits of combatting it entail much more, of course, than losses or gains in agricultural output. For some people, a decline in the quality of the land means a decline in the quality of the diet and chronic ill health. By reducing a region's opportunities for productive employment, desertification can create "ecological refugees" who must leave their homelands in search of a livelihood—and who swell the ranks of migrants gathering in the cities of the developing world. The loss of agricultural opportunities equals the loss of opportunities for economic growth, and, when lands are so degraded that they cannot be recovered, a nation's natural assets have been permanently reduced.

The negative environmental trends called desertification are widespread, long-standing, and, in many areas, accelerating. The technologies needed for reversing them are for the most part already available and are well summarized in the "Plan of Action" adopted

by the U.N. Conference in Nairobi. But too commonly lacking is a political commitment to their reversal commensurate with the size of the challenge. Faced with immediate crises—famines, strikes, and political intrigues—governments find it difficult to devote substantial resources to combatting a seemingly long-term and nearly invisible problem like ecological deterioration. They are especially reticent to do so when a shift in national priorities and investment patterns goes against the short-term personal interests of powerful elites. Governments that procrastinate too long, however, may one day be forced by events to see that their deteriorating agricultural landscapes are mirrored in deteriorating social and economic conditions.

The varied consequences of desertification—undernutrition and famine, unemployment and migration, deepening poverty and human desperation—are neither distant nor invisible.

Per Capita Grain Production in Sixteen Desert Countries, 1950-52 and 1973-75

Country	Per Capita Cereal Production (kg.)		Percent Change
	1950-52	1973-75	
Afghanistan	263	234	-11
Algeria	221	87	-61
Ethiopia	220	190	-14
Iran	182	185	+2
Iraq	269	156	-42
Jordan	143	79	-45
Lebanon	44	20	-54
Libya	99	106	+7
Mali	267	146	-45
Morocco	272	213	-22
Niger	303	169	-44
Senegal	142	186	+31
Sudan	102	150	+47
Syria	315	241	-24
Tunisia	216	184	-15
Upper Volta	193	180	-7

Source: U. S. Department of Agriculture.

# Parenthood before adulthood

By Helene Kaufman

Thirteen million young women became parents before they became adults in 1975.

Evidence shows that early childbearing is increasing virtually everywhere and is emerging as a pandemic health problem both in the United States and in developing countries around the world, leading to serious health, social and economic implications for young women, young men, infants, and society as a whole.

In the few societies where early childbearing takes place within socially accepted patterns, the risks and consequences of early pregnancy can sometimes be minimized through many service and support systems. However, if premarital sexual activity leads to an unwanted or unaccepted pregnancy, the adolescent often faces illegal abortion, forced marriage, social ostracism, infanticide, suicide, and barriers to health services, education, employment and social services that might minimize potential health and social risks for both the young mother and her child. Often, the unmarried pregnant adolescent is denied help when she needs it most.

The evidence clearly shows that the health of both mother and child is jeopardized by early pregnancy. These health risks include: maternal mortality, complications during pregnancy and labor, and mortality, prematurity and low birthweight for the infant. One of the accompanying tables shows the increased risk to infants born to mothers under 20, contrasted with those over 20. The infants of adolescent mothers show an increased risk of congenital defects, retardation, blindness, deafness, and other mental and physical handicaps. A second table dramatically represents the high mater-

nal mortality rates for some lesser developed countries as opposed to other developed ones.

The adolescent mother and her child often represent an added burden to the family and the community, for the mother frequently cannot contribute economically to either. In addition, education, employment, and other opportunities to improve her status are severely restricted.

The demographic impact of early childbearing results in shorter time periods between generations and large completed families, with concomitant increases in population growth rates. As the youth population increases, so does the magnitude of the adolescent fertility problem.

Adolescents are engaging in sexual activity and becoming pregnant at an earlier age for many complex reasons. Some critical factors include: increased youth mobility and sexual contact, particularly in urban areas; earlier onset of menstruation and fertility; delayed marriage, and erosion of taboos on premarital sexual activity.

The First Interhemispheric Conference on Adolescent Fertility, sponsored by AID and seven other concerned organizations, was held in August, 1976. Participants from over 38 countries in the developing world supported the right of all adolescents and their parents to receive information, education and services in order to reduce the incidence of unplanned pregnancy and childbirth. The importance of expanded opportunities for women was emphasized, so that adolescents who are prepared to use their energies and talents and play a vital role in the economy will delay childbearing. They also noted that pregnancy in women younger than 18 is inadvisable for health reasons, regardless of marital or socio-economic status.

Other recommendations included: 1) the legal issues of informed consent, free compulsory education, equal legal status for men and women; 2) the education and information issues concerning access to family life and

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sex education, sex education training for educators, informal methods of reaching adolescents regarding family planning information and services to complement traditional school based programs, and 3) research requirements to examine gender role conditioning, determinants of attitudes toward sexual behavior and parenthood, and exchange of information and findings on successful programs.

Since the conference, many youth programs have been implemented or are in the planning stages. For example, International Planned Parenthood Federation initiated a youth education program for young women in the factories in Kuala Lumpur sponsored by the Malaysian Trade Unions Congress. In Kenya, Family Planning International Assistance has worked with the YMCA on a family life education program for young people. The Dominican Republic, Mexico and other Latin American countries are engaged in government programs designed to introduce sex education into the general public school curriculum. In the Philippines, the Communications Foundation for Asia is designing a "Young People's Guide to Sex and Family Planning."

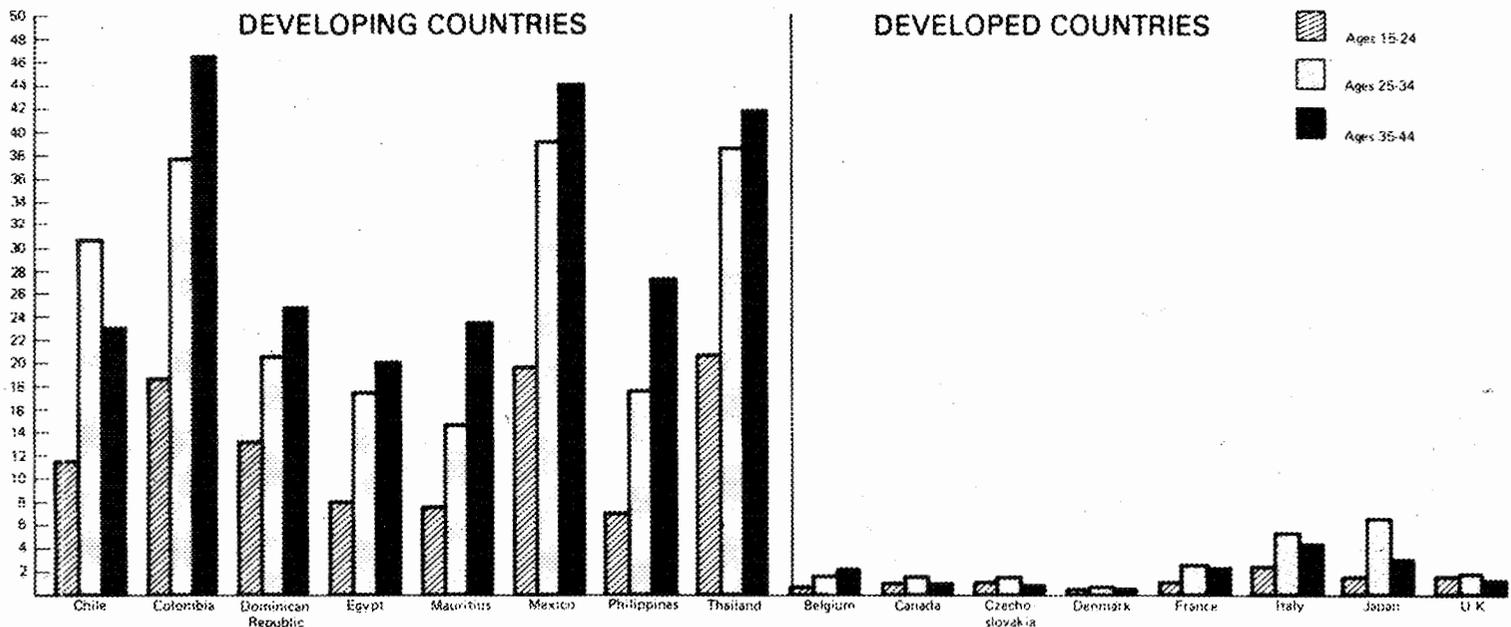
In addition, AID has sponsored a series of dialogues in which leading ministry and private professionals engaged in program planning for adolescents in several countries. These country seminars bring together representatives of many disciplines, government ministries, service organizations and academic institutions to explore the country-specific dimensions of the problem,

and possible public and private responses to existing needs for research, education and services.

One of the most serious problems in initiating action-oriented programs is the reluctance of adults around the world to recognize and address the fact of adolescent sexuality. Government leaders often do not understand the scope of the problem since extensive research on the subject is nonexistent in many lesser developed countries. Benjamin Viel of International Planned Parenthood-Western Hemispheric Region, an expert on this subject, has already initiated a series of research projects designed to examine the serious social consequences of unwanted pregnancies among adolescents. He believes that illegal abortion, infanticide, prostitution, and suicide are often linked with adolescent pregnancy. In Latin America, the unmarried young mother often faces social abandonment, and the social consequences for both the mother and society are severe.

Adults are sometimes fearful that increased information about sexuality and reproduction and the availability of contraceptive services for adolescents might foster promiscuity. However, studies in the United States have demonstrated that over 75 percent of the adolescents who come to family planning clinics are already sexually active and need contraception to prevent early parenthood.

Thousands of young girls become pregnant without any awareness of the reproduction process or information on the availability of contraception. Young women who are unmarried are routinely excluded from most



Comparison of mortality rates per 100,000 women during their reproductive years, in developing countries and developed countries, for deaths due to pregnancy and childbirth. This includes numbers 112-118 from the "A" List of the International Classification of Diseases: toxemias of pregnancy and the puerperium, hemorrhage of pregnancy and childbirth, abortion induced for legal reasons, other and unspecified abortion, sepsis of childbirth and the puerperium, other complications of pregnancy, childbirth and puerperium, delivery without mention of complication. Data from World Health Statistics Annual

family planning programs and even young married women who desire to delay their first pregnancy are often unable to obtain family planning services. If contraception is offered only within the context of the maternal and child health programs, a young woman must often have an early pregnancy to become eligible for contraception and to control her reproduction.

As governments pledge to bring women into the mainstream of development planning and programs, the necessity to prepare young women and men for responsible parenthood is critical. Women cannot play a major economic and social role in the developing world if they are forced into a parental role at an early age by ignorance and unavailability of contraception. A young woman cannot utilize opportunities for education and employment if early pregnancy and childbirth are in themselves barriers to entry into such fields.

Instituting strong social pressures against early pregnancy, as in China, and fostering cultural traditions and religious values that encourage sexual responsibility among youth are important components of any societal response to early unwanted pregnancy. However, introduction of increased mobility, erosion of traditional sexual taboos, social upheaval and urbanization have resulted in an ever-increasing rate of adolescent fertility. In order to confront the existing problem, family life education and family planning services address the needs of sexually active youth and prevent early unwanted pregnancy.



**Average Neonatal and Infant Mortality Rates in Projects of Inter-American Investigation of Mortality in Childhood, 1973**

Country, Project Location	Neonatal Mortality (Deaths in first 27 days of life per 1,000 live births)		Infant Mortality (Deaths in first year of life per 1,000 live births)	
	All Mothers	Mothers Under 20	All Mothers	Mothers Under 20
Argentina, Chaco Province	32.2	53.4	80.1	133.5
Brazil, Ribeirão Preto	28.2	36.2	52.6	72.1
Brazil, São Paulo	33.7	52.3	65.1	104.1
Canada, Sherbrooke	13.5	16.4	18.3	21.2
Chile, Santiago	26.6	31.7	55.2	79.3
El Salvador, San Salvador	29.6	40.7	88.4	116.6
Mexico, Monterrey	26.0	33.1	60.7	86.3
USA, San Francisco	12.7	17.2	17.5	26.2

*Adapted from Puffer and Serrano.*

# Battle Against Blindness

By Carl Fritz

The war on hunger is more than an effort to produce more food. Matters of nutrition, health and education are frequently interconnected. Nowhere is this more evident than in the villages of West Java where the Indonesian Government, assisted by A.I.D. and Helen Keller International, is carrying out a major research program on the clinical and socio-economic aspects of childhood eye disease caused by dietary deficiencies of vitamin A.

Xerophthalmia, the eye disease caused by lack of vitamin A, can cause permanent impairment of eyesight, blindness, and even death.

In a country of lush vegetation, one may wonder why people are deficient in vitamin A. Farmers produce fruits and vegetables for the city market but poor rural people cannot afford these relatively expensive foods. However, this is not the primary cause of vitamin A deficiency in West Java.

Milled rice is the main food in Indonesia, and it appears that many children are considered "fed" when they eat their daily rice and an occasional dried fish. In addition, most parents in Indonesian villages have received little or no education and find it hard to understand how what one puts into his mouth can have anything to do with his eyes. Thus, a common local treatment for night blindness is the placing of raw lamb's liver on the eyes twice a day.

To pinpoint the problem of vitamin A deficiency among the children in the villages, a compilation of basic socio-economic data on rural families in West Java was undertaken by the government with help from A.I.D. and Helen Keller International. The data obtained concerned more than 8,000 children under six years old.

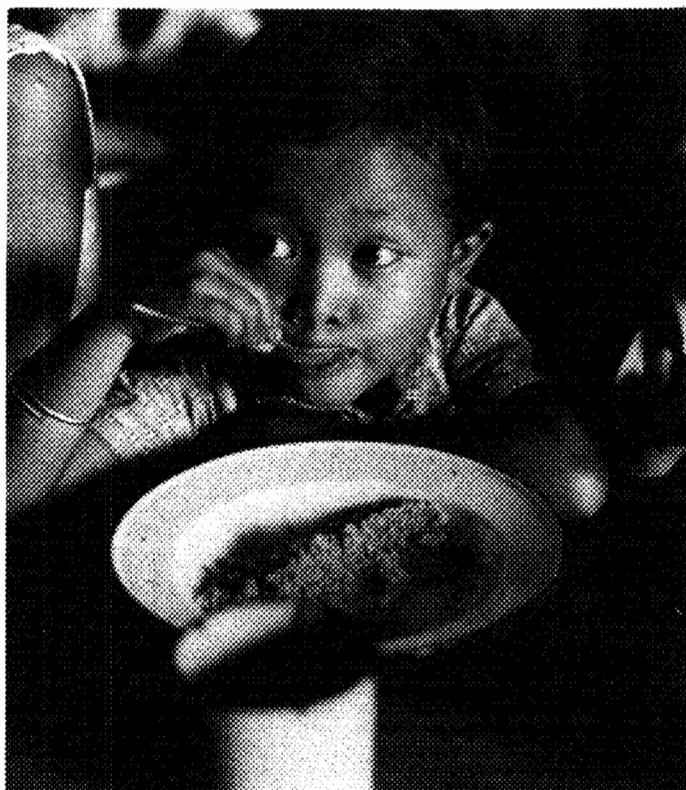
Interview forms were devised on the basis of experience in conducting preliminary mini-surveys. Information on wealth and income was obtained, not in monetary terms but in terms of land and livestock owned, the type of house in which the family resides, the source of lighting, the occupations of family members, years of education, the basic foods eaten and whether they are home-grown or purchased from the market. Ages of family members are based on the Arabic calendar. Care was taken to recruit and train enumerators for the project who were fluent in the local dialect.

The enumerators began their field census in January 1977. During the census period they made their homes

in the villages where they worked, using their per diem to rent houses and rooms from the villagers. During the day they went from house to house seeking families with one or more children less than six years old. They patiently interviewed senior members of each family, and visually checked, when possible, the data they were given. At night they met together to recheck their forms and to relate the problems encountered during the day and how they solved them.

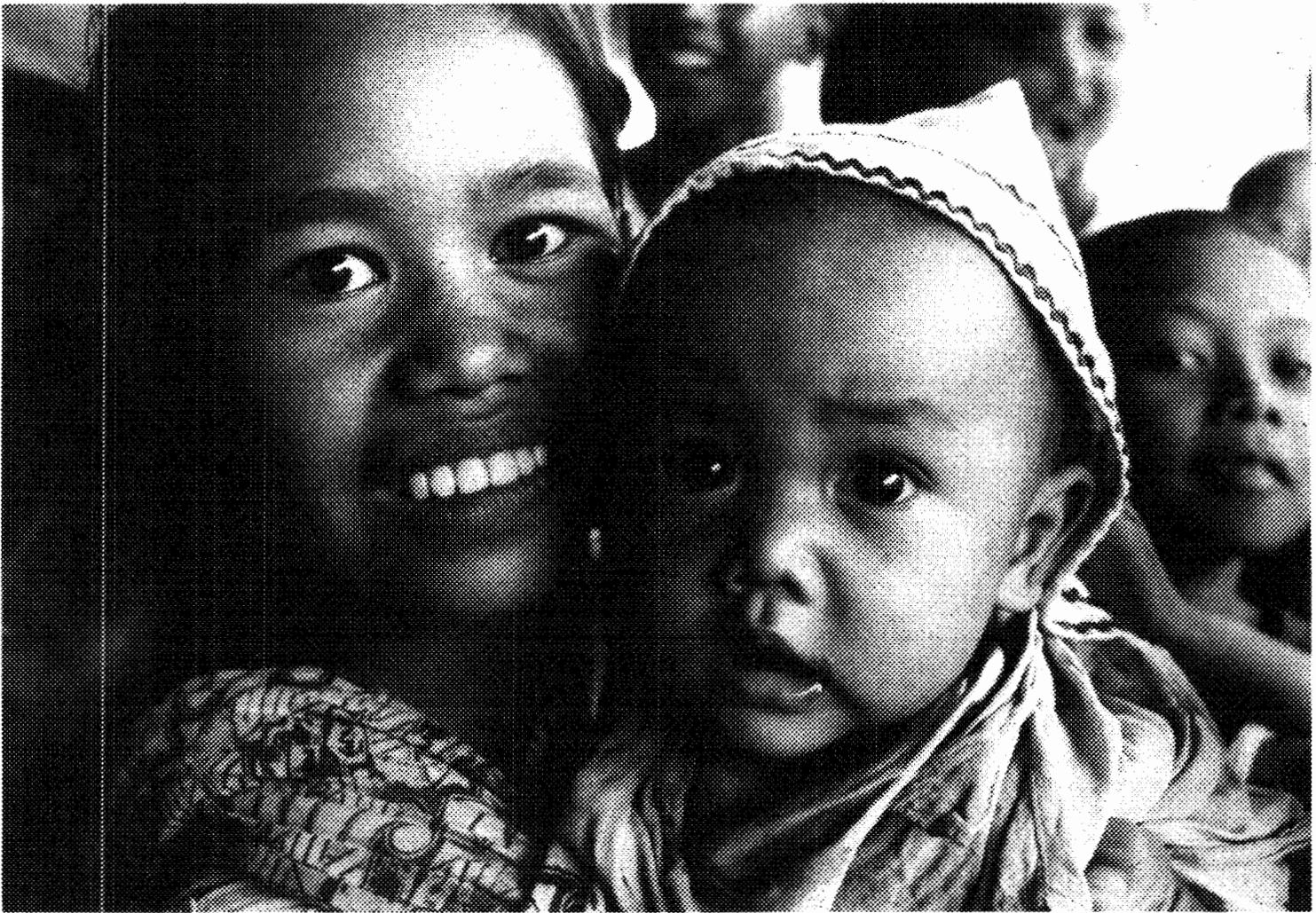
During the first crucial weeks of the census, the project statistician lived with the enumerators so he could understand their problems and give them advice. Subsequently, forms were collected at least once weekly and doublechecked at project headquarters by clerical staff directed by the statistician. Feedback of the results to the enumerators served to correct and improve their work, and they rapidly became a seasoned team.

In March of this year, before completion of the initial census, the project launched the first of a series of clinical examinations of the 8,000 children being surveyed. The clinical team—an ophthalmologist, a pediatrician, a nutritionist, several nurses, aides and enumerators—



Many families consider their children "fed" when they eat their daily bowl of rice.

*Mr. Fritz works with Helen Keller International in Indonesia.*



*Without vitamin A, this young child could suffer severe eyedamage, possibly even blindness.*

### **Editor's Note**

During the 1974 World Food Conference, the United States pledged to support a world-wide effort against vitamin A deficiency. To ensure a comprehensive world-wide effort, an International Vitamin A Consultative Group (IVACG) was formed through the initiative of the Office of Nutrition, Technical Assistance Bureau, AID.

Members of the IVACG include key scientists and members of bilateral and United Nations donor agencies. The purpose of IVACG is to provide guidance to LDC's and donors in instituting vitamin A operational and research programs. The first two annual meetings of the group resulted in the publication of a basic document entitled "Guidelines for the Eradication of Vitamin A Deficiency and Xerophthalmia." More than 3,000 copies of this publication are in use today.

The IVACG guidelines recommend a four-pronged attack on vitamin A deficiency: 1. determination of magnitude and geographic dis-

tribution of vitamin A deficiency; 2. implementation of appropriate prevention programs and intervention strategies based on country needs and available resources; 3. evaluation of the effectiveness of implemented programs on a continuing basis; and 4. support of priority research needs.

Surveys of vitamin A deficiency on a national or regional basis have been completed or are underway in Sri Lanka, El Salvador, Guatemala, Indonesia, and Egypt.

The identification, implementation and evaluation of mass delivery intervention strategies and prevention programs are underway in Guatemala, Haiti, the Philippines, and Indonesia. The strategies include distribution of vitamin A capsules; nutrition education; nutrition education combined with horticultural incentives; fortification of staple foods; and fortification of widely-used food flavoring agents.

The most comprehensive activity of the vitamin A program is currently underway in Indonesia.

erators—organized their workspace and living quarters in a house in Purwakarta, a two-hour drive from Bandung.

Each weekday morning the clinical team set out for a pre-selected village site to talk with local authorities. Often their vehicles were unable to reach the study site, and the team could be seen with their boots and umbrellas, trudging through mud for several kilometers while carrying their clinical equipment and forms.

At a previously selected central point (CP), usually a house donated for the day, a portion of the team organized its work space while the enumerators, using maps prepared by the census team for this purpose, sought out the families with children under six years of age. At each house the enumerator conducted a short interview, at which time he checked the identity information provided on his forms, and inquired about new family members and those who had died or left the family. He then encouraged the parents to bring their young children to the CP.

In all study sites, the results were excellent. Mothers dressed themselves and their children in their finest clothes and joined the growing crowds at the CP. Frequently fathers and older siblings came along to help with the small children. Although only a very small percentage of the families visited were reluctant to bring their children to the CP, most of the absentees, less than 10 percent so far, were not at home when the enumerators made their call.

It was amusing to watch the antics of the children at the CP, where the clinical team examined them for height and weight, eye problems, general health, and nutritional status. A few of the children were apathetic, most were at least slightly uneasy, some were suspicious, and there were those who were frightened to tears. The good natured ophthalmologist joked with the mothers and bantered with the children to put them at ease.

The pediatrician had greater problems because he had to probe around the child's body with his hands, and worse yet, with a metal instrument Westerners know familiarly as a stethoscope.

Quite often a child's age was in dispute. If the child was born before the 1971 elections, he was ineligible for the study. Although some children were over-age, doctors proceeded with the examination, treated the sick child and referred him to the appropriate medical authorities. They would send children with active, curable eye disease to an eye hospital in Bandung where the child would be treated and his condition further studied.

For every child diagnosed as abnormal in his eye exam, the nurses took a blood sample and the nutritionist conducted a special dietary interview. Biochemists in

Bogor later would analyze the blood for its vitamin A and carotene content, retinal binding protein, albumin and prealbumin. The doctors chose the nearest child examined of the same age and sex, and recorded him as a matched control. The parents of this child were then encouraged to have his blood examined and to provide special dietary information. Random samples were also chosen to obtain similar information about general nutritional conditions in the area. Later the Indonesian researchers and the American scientist on the project examined, and compared and analyzed this data with the aid of computer facilities at the Institute of Technology in Bandung.

Obviously young children do not enjoy getting their fingers pricked for blood. Almost always the mothers smiled and bravely cooperated. Occasionally a mother would protest if her child was very young, because she couldn't understand the scientific reasons for her apparently healthy child being a matched control or random sample.

To guard against seasonal abnormalities in available foods, income and disease patterns, the clinical team will conduct re-examinations of these 8,000 children over the next two years. From analysis of the resultant data new scientific information should emerge on the incidence and development of eye disease in Indonesian children due to vitamin A deficiency; its epidemiological characteristics; and its relationships to protein-calorie malnutrition, other childhood disease, and associated socio-economic factors.

Data obtained from this research will be of value to the Indonesian Government in planning appropriate intervention programs. If the research indicates, for example, that the families of children with eye disease eat nutritious food which is not shared with the children, one form of educational intervention may be suggested. If no one in the family eats food containing vitamin A, but it is found that such food is readily available, a different educational approach may be required. If foods containing vitamin A are unavailable or expensive, horticultural activity may be in order. If it is found that the affected population commonly consumes a food, drink or spice which is packaged by a small number of producers, vitamin A fortification may be the answer.

The Indonesian Government is not the only beneficiary of the results of this research. The Indonesian experience and resultant data will be made available to the International Vitamin A Consultative Group for comparison with experience and data obtained elsewhere. Thus, the war on hunger continues with a specific battle against the type of malnutrition which causes childhood eye disease in the less developed world.

# IN PRINT

## Health and the Economy

A review by John Dennis Chasse

*Health Economics in Developing Countries*, by Alan Sorkin, Lexington, Massachusetts: Lexington Books, 1976.

Health and economics have become uneasy bedfellows in the past few years. Uneasy because the devotees of the dismal science often appear hard-hearted to health professionals, and because, at least historically and always with notable exceptions, health activities did not play a major role in economists' models of the nature and causes of the wealth of nations. But financial constraints have forced health professionals to deal with an economic problem—the allocation of scarce resources. In addition, the role of a healthy population has grown more central now than in the past to theories of economic growth. It took considerable research and experience to bring this state of affairs about, and Alan Sorkin quite neatly surveys and synthesizes that experience in eight concise chapters.

His first four chapters cover, for the most part, the broad questions of health, nutrition, population growth and economic development. It is possible to gain some understanding of the evolution in economic understanding by examining the simple framework he lays down in his third chapter. An activity which reduces morbidity and mortality, he says, can increase the productive capacity of a society by "(1) increasing the number of man-hours available; (2) increasing the quality or productivity of the work force; (3) making feasible the settlement of unsettled regions; (4) changing the attitudes of persons toward innovation and entrepreneurship." Numbers one through three summarize what might

Mr. Chasse is Consultant to U. S. Office of International Health.

be called the previous theory. Number four was formulated and empirically tested by Wilfred Malenbaum. The previous economic approach added its own, a population effect.

This followed from an intellectual framework which saw physical capital accumulation as the key to economic development, and consumption in direct competition with investment for national output. Declining death rates, in this framework, would induce, through accelerated population growth, an increase in consumption, hence a reduction in saving and with it, in investment and economic growth. This negative effect had to be balanced against the positive effects of improved health. But, since the early sixties, it has been shown that the simple accumulation of physical capital is probably not the single most important factor in the process of development, that labor should not be thought of in homogeneous terms, and that empirical evidence does not support the older, simpler theories. It takes considerable skill to present a simply synthesis of what is known now, and Sorkin does so, dispassionately and unpretentiously.

Noteworthy among new developments is the growing understanding of the field of nutrition. Evidence of the relationship between under-nutrition and mental retardation has rightly influenced an economics profession newly concerned about the effects of population quality on economic growth.

In addition, examination of the complex interaction between different morbid agents and malnutrition poses a problem for public health officials. The interaction is referred to as Synergistic. It is defined by

Taylor and Scrimshaw in the following way:

*When infection aggravates malnutrition and malnutrition lowers resistance to infection, the relationship between the two can be classified as synergistic, i.e. the simultaneous presence of malnutrition and infection results in an interaction that is more serious for the host than would be expected from the combined effect of the two working independently.*

This, of course, makes it more difficult to predict the impact of any specific health intervention on a defined problem, and so the new field of nutrition has posed difficulties both from the viewpoint of national development, and in the more limited area of planning health programs.

There are a few surprising omissions from the book. The effect of rising living standards on health seems slighted. It is passingly mentioned in Chapter 3, while two or three pages are devoted to anecdotes from one article which showed how economic development projects can injure the health of the citizens. (For instance, some irrigation projects have introduced schistosomiasis to an area or provided an ideal breeding place for malaria bearing mosquitoes.) Sorkin summarizes the Hall-Taylor explanation for the emigration of physicians from poor countries, but does not mention Oscar Gish's provocative arguments on the subject. Nor does his discussion of population growth include any reference to Julian Simon's scholarly and novel work in the area. But, these are minor objections. Sorkin has written an excellent reference book, a fine introduction, and required reading for anyone interested in this area.

## IN BRIEF

### Malaria Epidemic

AID has made a \$12 million loan to Sri Lanka to help combat a widespread malaria epidemic affecting an estimated one million people annually.

An infectious disease characterized by chills, fever and sweating, malaria plagues 60 percent of Sri Lanka, an island nation of 14 million people in the Indian Ocean. It is transmitted by the infected female anopheles mosquito.

Highly debilitating, and sometimes deadly, malaria causes high infant mortality, stillbirths and abortions. It also causes anemia and enlargement of the spleen and reduces resistance to other infections.

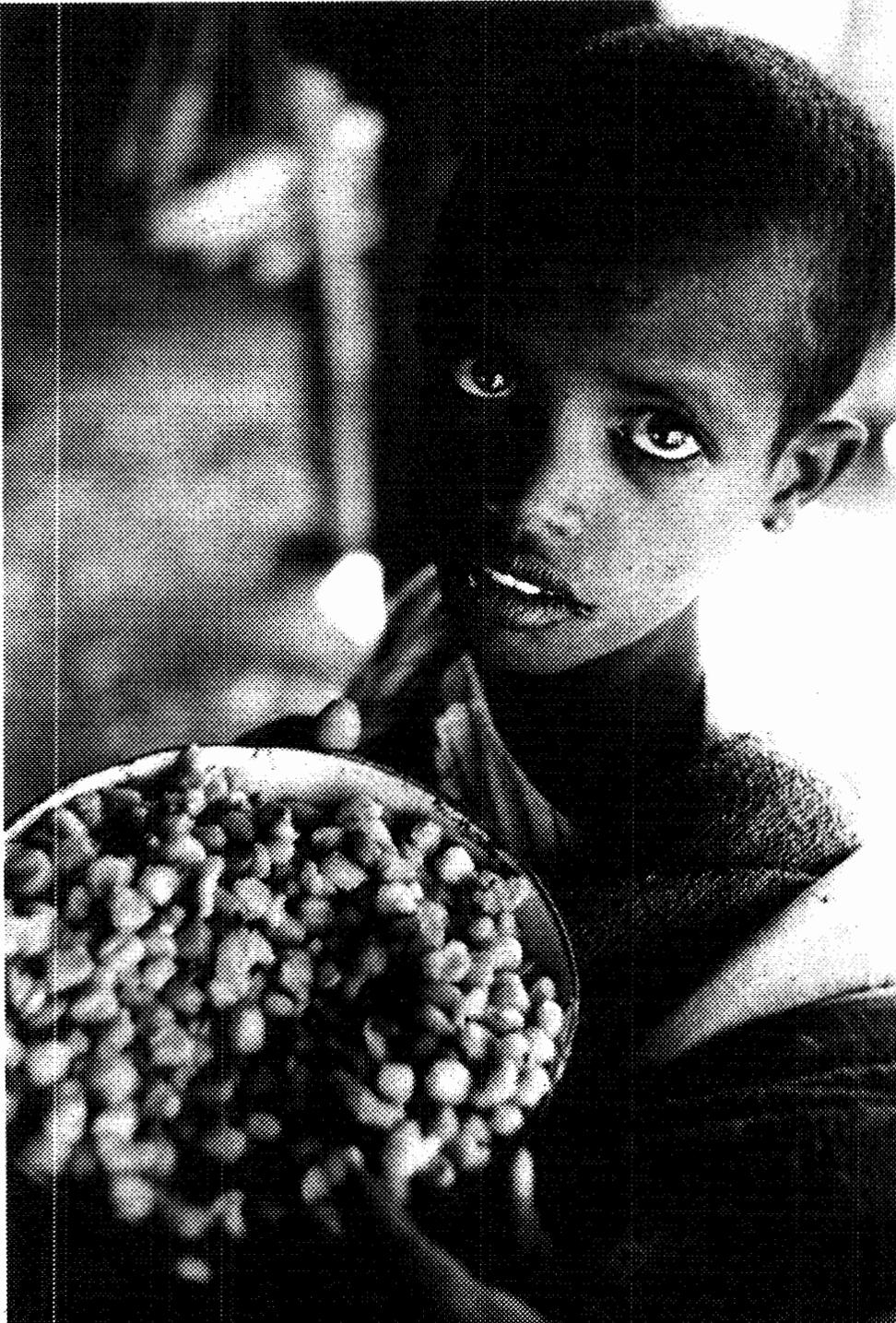
Malaria is particularly devastating in the rural dry zones of southeast Sri Lanka, where rice and other important agricultural production is reduced by the disease. A severe drought has dried up rivers and created pools of stagnant water that serve as ideal breeding areas for mosquitos. To avoid malaria, many farmers have abandoned their rice fields. In fact, many of the country's once highly productive areas have been abandoned over the last several decades because of malaria.

In addition to AID, other donors expected to assist in the program are: the United Kingdom, \$4.3 million grant; Netherlands, \$4.3 million grant; and the World Health Organization, \$500,000 grant.

### Aid to the Caribbean

The United States is moving to help Caribbean nations find solutions to the serious socio-economic problems now facing them. The help involves projects totalling \$79.2 million.

The 25 Caribbean political entities—10 of them are independent nations—are at different stages of development with immense political, cultural and economic diversity. Al-



**"A lasting peace cannot become reality  
when people of many nations of the  
world suffer mass starvation."**

*Jimmy Carter, President of the United States*

Agency for International Development Washington, DC. 20523

*This poster is available from the Agency for International Development. It measures approximately 15½ by 29½ inches. For your free copy of this poster, write to the Agency for International Development, Office of Public Affairs, Washington, D. C. 20523.*

most all are experiencing economic declines.

To help the area AID is currently conducting bilateral assistance programs in Haiti, the Dominican Republic, Jamaica and Guyana, and channeling assistance to the smaller English-speaking states through regional institutions such as the Caribbean Development Bank, the University of the West Indies, and the Caribbean Research and Development Institute.

### Sri Lanka Irrigation

AID is providing a \$5.2 million loan and an \$800,000 grant to Sri Lanka to help finance an agriculture and area development project along the Mahaweli River.

The multi-donor project calls for developing 106,000 acres with irrigation for resettlement of more than 15,000 landless families in north central Sri Lanka, an island nation with a population of 14 million and a per capita income of \$130.

In addition to AID, other donors to the five-year project are the World Bank, \$19 million; Netherlands, \$5 million; United Kingdom, \$7.2 million; Canada, \$6 million; and the Government of Sri Lanka, \$28 million toward financing of the farm equipment. The total estimated cost of the project is \$80 million.

### Skipjack Tuna

The Agency for International Development is providing an initial \$300,000 grant to the South Pacific Commission to help finance a multi-donor survey of skipjack tuna fish in the central and western Pacific Ocean.

During the three-year survey, about 100,000 skipjack tuna will be tagged and released. Their migratory movements and spawning habits will be studied to determine if new sources of tuna catches can be developed and exploited for world food supplies.

In addition to the United States—which is contributing about 20 percent of the program costs—the other countries supporting the survey are Australia, New Zealand, United Kingdom, France, and Japan.

## QUOTES

"A combination of intensified agricultural research and 'political will' could result in elimination of the worst aspects of the world food problem by the end of this century. If there is the political will in this country and abroad . . . it should be possible to overcome the worst aspects of widespread hunger and malnutrition in one generation."

*Science Weekly*  
July 8, 1977

"A new look at the country's foreign aid program is needed if Americans are to be persuaded to increase the amounts they contribute to the impoverished peoples of the world. This country now spends on foreign aid only half the proportion of its wealth that it did 15 years ago—and only one-eighth the proportion spent during the Marshall Plan years."

*New York Times*  
August 13, 1977

"The temptations to overload an aid program with other foreign policy objectives will have to be resisted. To do any good, aid must be perceptibly helpful to needy peoples. Unless it is, the disenchantment of the public and the Congress will frustrate even the noblest designs."

*New York Times*  
August 13, 1977

"The White House is seriously considering a plan to create an International Health Services Corps, modeled after the Peace Corps, to bring U.S. medical know-how to underprivileged people around the world."

*U.S. News and World Report*  
August 22, 1977

"The hottest commodity in Africa these days isn't gold or oil. It's coffee. For many of the continent's impoverished countries, a bean in the bag is worth more than a buck in the bank."

*David Lamb*  
*Los Angeles Times*  
August 23, 1977

"Any long term solution to the food problem lies in the expansion of agricultural production in the developing countries themselves, especially in the very areas where food shortages are most severe.

"We shall avail ourselves of American university skills in all aspects of our foreign agricultural effort. We look forward to university involvement in policy formulation, program design, implementation and evaluation.

"We hope to get our universities more directly involved in the field operations of our programs. That is where the job has to be done—in close cooperation with officials of recipient countries, and the scientists and farmers of these countries."

*John J. Gilligan*  
*AID Administrator*  
July 1977

". . . for less developed countries specializing in a single export, such as tin or rubber or coffee, price fluctuations can be devastating. Hard times may push the incomes of millions of laborers below subsistence. Good times bring relief, yet sow the seeds for future collapse as small producers rush to expand output. In addition, price fluctuations may make it impossible to attract needed foreign investment. Most banks and corporations are leery of staking the future on a roller coaster.

"One answer to the problem is commodity price stabilization: long-term agreements between suppliers and consumers that allow both to plan for their future. The idea has long been advocated by the less developed countries. . . ."

*The New York Times*  
March 14, 1977

"I believe we can build real and lasting friendships with the peoples of the developing world if we take positive and sincere steps to reduce the gap which exists between their standard of living and our own, reducing the gap not by reducing our standard of living but by assisting them in raising theirs."

*Senator Harrison Schmitt*  
*(R-New Mexico)*  
March 10, 1977

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