Hunger in Africa: the link between unhealthy people and unhealthy soils

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Malnutrition is the biggest risk factor for illness worldwide. Various dimensions of malnutrition (eg, underweight, zinc deficiency, iron deficiency, vitamin A deficiency) account for seven of the 13 leading risk factors associated with the global burden of diseases.[1] For both children and adults, malnutrition reduces the body's natural defences against a vast range of diseases. The death rate from diseases such as lower respiratory infection, malaria, and measles, which account for a large proportion of children's deaths, are much higher in children who are underweight or have specific nutrient deficiencies than in those who are not.[2–4] Undernourished people infected with HIV/AIDS develop the full symptoms of the disease more quickly than people who are well fed.[5] Yet one of the earliest side-effects of AIDS is reduced consumption of food in affected households.

Inadequate sanitation, repeated bouts of infectious disease, chronic parasitic infections, poor health facilities, and unsafe water sources contribute significantly to malnutrition by increasing the burden of illness for both children and adults. Households that are dependent on well or surface water for drinking are more likely to have underweight children because the water is more likely to be contaminated.

Panos Pictures

The fact that malnutrition has many causes, including infectious disease itself, has led to the recognition that multiple, synergistic interventions are needed to fight malnutrition, including improved diets, safe drinking water and sanitation, special attention to vulnerable groups (pregnant women, lactating mothers, young children, unemployed people, those with HIV/AIDS, socially excluded groups), and access to health services to prevent and treat infections. Disease prevention and treatment is both an end in itself and an input to improved long-term absorption and use of food.[1,4,6]

Yet because the world as a whole produces enough food for the entire world population, and because countries such as India with massive malnutrition also produce enough food to feed their entire populations, recent approaches to combat malnutrition have de-emphasised food production itself in the interventions needed to combat malnutrition. The emphasis instead has been placed on increasing access to food by increasing the purchasing power of the poor together with better health care, sanitation, education, hygiene, and nutritional practices.

These generalisations, however, do not apply to tropical sub-Saharan Africa (henceforth Africa). The UN Millennium Project Task Force on Hunger has identified Africa as the region facing the greatest challenge in attaining the Millennium Development Goal for hunger—reducing the proportion of people who suffer from hunger by half between 1990 and 2015.[7] The prevalence of hunger in Africa is pervasive and rising. By contrast with most of Asia, Latin America, and the middle east, however, Africa is experiencing a decline in overall food production per capita. Its farmers generate the lowest food output per hectare of any major region in the world, and its farm households account for most of the continent's hungry population. The task force has concluded that for most of Africa, as well as some remote parts of Asia and Latin America, increasing food production has to be included as an essential part of the synergistic interventions to fight malnutrition.[7,8]

Understanding Africa's food productivity crisis

Africa, unlike Asia, did not benefit from the green revolution, one of the key successes of humankind in the latter third of the 20th century. Food production in developing countries tripled during the past 30 years, the number of rural poor decreased by half, the proportion

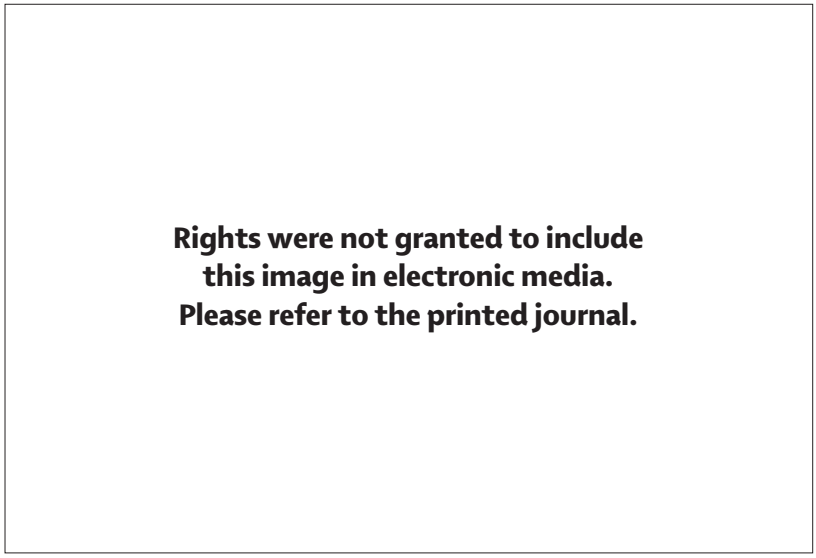
of malnourished people dropped from 30% to 18%, and the real prices of the main cereal crops fell by 76%. Several decades ago, a small group of determined scientists and policymakers identified the key entry point for producing such a green revolution—the need for high-yielding varieties of rice and wheat. When that goal was attained other necessary factors were put in place, such as enabling government policies, fertilisers and irrigation, better marketing, infrastructure, national research institutions, strong agricultural universities, and the international agricultural research system.

This success did not extend to Africa. Although the rate of adoption of improved crop varieties has been uniformly high in all developing regions, their contribution to crop yield increases has been 70–90% in Asia, Latin America, and the middle east, but only 28% in Africa.[9] Overall improvements in food yields in Africa have lagged far behind the rest of the developing world.

In Africa, soil nutrients and water management are the major limiting factors, not improved crop varieties. Fertilisers are almost unused by Africa's smallholder farmers on staple food crops. The main result is a massive and widely unrecognised deterioration of soil health in Africa, by contrast with other developing regions. Moreover, almost all crops in Africa are rain-fed rather than irrigated, because of the absence of major river systems for irrigation, electricity for irrigation pumps, and other factors that limit irrigation. Rainfall is highly variable and often inadequate over much of the continent. Therefore the key entry point for African food production is not improved crop varieties but replenishment of soil fertility, coupled with improved water management at the lowest possible cost. No matter how good genetic improvement is, crops cannot grow well without sufficient nitrogen and phosphorus. This is a biological imperative that transcends socioeconomic and political ones.

The crisis in soil health is a quiet catastrophe. Over the decades, Africa's small-scale farmers have removed large quantities of nutrients from their soils without returning them in sufficient quantities as manure or fertiliser. Additionally, almost all crop residues have been removed. These practices have resulted in a very high average annual depletion rate—22 kg of nitrogen, 2·5 kg of phosphorus, and 15 kg of potassium per hectare of cultivated land over the past 30 years in 37 African countries. This annual loss is the equivalent of US$4 billion in fertiliser.[10] This widespread nutrient mining has decreased soil organic matter, decreased the ability of microorganisms to recycle nutrients, and the soil's water holding capacity.

The major economic reason for lack of fertiliser input has been the poor infrastructure in rural areas of Africa. Road density per person and per area is an order of magnitude lower than in south and east Asia, and railways are non-existent or decrepit. The farm-gate price of fertiliser is often two to six times that of the rest of the world because of very high overland transport costs after the fertiliser arrives at an African port. Moreover, rural poverty spirals in a vicious circle. With rural hunger and poverty, rural markets are weak, credit is very limited, and access to information is poor. When a particular region enjoys an increase in food production, for example because of a temporary increase in fertiliser use, local prices of food tend to plummet because of the lack of regional transport and storage facilities. This fall in turn discourages farmers from maintaining a high level of farm inputs in the next season.[7]



Still Pictures

Time for a 21st-century green revolution for Africa

The time is right to increase dramatically the productivity of African agriculture, with a new and highly focused plan that UN Secretary-General Kofi Annan called "a uniquely African green revolution for the 21st century".[11] New techniques in farming can help make this change possible. The low soil nitrogen can be replenished not only by chemical fertilisers but also by agroforestry, through the planting of leguminous trees that fix atmospheric nitrogen in the soil. New grain-and-tree-crop systems have proved to be highly reliable and economic in many parts of impoverished rural Africa, offering farmers not only far higher food yields but also the added benefit of fuel wood that can be harvested from the leguminous trees. Low-cost water harvesting techniques can be combined with agroforestry to promote a highly reliable package of soil and water interventions. These novel approaches should be complemented with increased use of conventional approaches as well, including chemical fertilisers and irrigation where appropriate.

The Hunger Task Force's plan, together with the other Millennium Development Goals recommendations,[12]

brings forth the nexus between agriculture and nutrition, health, water, and sanitation, to fulfill the secretary-general's vision[11] and that of task force members. The task force emphasises the role of increased donor support in restoring soil health, expanding water harvesting and small-scale irrigation, and investing in critical rural infrastructure (roads, power, telecommunications) to integrate rural farm communities with regional, national, and international markets. These increased investments should be facilitated by a new cadre of paraprofessional extension workers at the villages, trained to deal with agriculture, nutrition, markets, health, and energy, in turn supported by professional extension services and greatly enhanced research institutions. The agricultural interventions aim to boost the quantity and quality of food output and raise rural incomes. To fight hunger, these agricultural interventions would be closely integrated with the critical interventions in primary health care, access to safe drinking water and sanitation, and micronutrient supplementation that have been successfully deployed in many parts of the developing world, but not yet in rural Africa.

In Asia, hunger was reduced decisively within a generation. It is now time, and feasible, to do the same in Africa. The survival, health, and prosperity of Africa's children require nothing less.

Contributors

PAS and MSS co-chair the UN Millennium Project Task Force on Hunger.

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