

Creating Food Secure Populations: Globalization & Biodiversity

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Introduction

“Food Security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritional food to meet their dietary needs and food preferences for an active and healthy life” (FAO 1996)

Google, the search engine used by the World Health Organization, defines malnourishment as lack of the minimum amount of fluids, proteins, carbohydrates, lipids, vitamins, minerals and other nutrients essential for sound health and growth.¹

Approximately 800 million people, including 200 million children, are malnourished. This is equivalent to 1/6th of the world’s developing nation’s population. The Food and Agriculture Organization (FAO) estimates 34% of people (185.9 million) in sub-Saharan Africa experience hunger for a portion of the

<u>Hunger Facts</u>	
◆	800 million people are estimated to be malnourished
◆	In developing countries 1:5 people are chronically hungry
◆	790 million people in developing countries are chronically undernourished
◆	34 million people in industrialized countries are undernourished.
◆	In the industrialized world, 100 million people live below the poverty line, greater than 5 million are homeless and 400 million are without a job
Source: Food and Agriculture Organization FAOStat	

year. In developing countries 828 million people lack enough food to sustain normal activity.² In the United States, 12 million children are chronically hungry.

Hunger and food insecurity are global problems created by many factors including; environmental events, war and conflict, HIV/AIDS and general poverty. The United Nations has set a goal of reducing the number of chronically hungry people (as established in the 1996 World Food Summit baseline report) by one-half by 2015.³ Efforts to alleviate global hunger can be divided into two major sectors, development and relief. Relief programs will be needed as long as there is war, drought, flooding and other acute, unplanned natural and human disasters. Agriculture and economic development programs

are routinely implemented to fight chronic hunger. “In general, countries that succeeded in reducing hunger were characterized by more rapid economic growth and specifically by more rapid growth in their agriculture sectors.” And yet, “.... the problem is not so much a lack of food as a lack of political will”.⁴

The United States Department of Agriculture (USDA) administers several foreign food assistance programs (Appendix I). In fiscal year 2002, these programs combined 2.4 million metric tons of food aid valued at \$598 million.⁵ U.S. Food Aid programs came into being in the 1950’s as a way of liquidating rapidly growing surplus grain stores.⁶ Commodities for food aid programs are acquired through surplus purchasing programs, commonly Public Law 480 (PL480). It must be noted that these surpluses are surplus *after* U.S. consumption and private sector foreign export sales.

This paper will focus on the impact U.S. commodity surpluses have on agriculture production in developing nations, promotion of food insecurity and potential impacts to biodiversity. The issues relating to global (and subsequent local) food insecurity reach far and wide. My point of reference will be communities in sub-Saharan Africa. For the purposes of this paper, bioengineering and genetically modified foods will not be discussed. Although the potential influences on agriculture production and genetic resources are immeasurable.

Agricultural Commodity Trade and Food Aid

“He who disdains the fall of infant mortality and the gradual disappearance of famines and plagues may cast the first stone upon the materialism of the economists” Ludwig von Mises

In 2001, USDA farm subsidies, comprised of commodity, conservation and disaster relief programs, equalled \$22,463,655,400 paid to 1,880,173 businesses. Commodity subsidies accounted for \$18,104,883,300 of this total. Farm subsidy values have tripled in

the last five years (\$7,455,000,000 in 1997) with the majority realized in commodity programs, although a decrease has been seen in 2002.⁷ Subsidy transfers are implemented through programs that impact market prices at every level. Payments can be received for input and harvesting costs; national and international transportation costs; and marketing costs.⁸ These are comprised of loans, tax breaks and direct payments.

Agriculture and export subsidies underscore true production costs enabling US crops to be sold in the international market at below-market-value prices. Commonly referred to as *export dumping* “ – the practice of selling products at prices below their cost of production - [it] is one of the most damaging of all current distortions in world trade

Commodity	Production Cost (US\$/bushel)	Gov't. Support Cost	Transp. & Handling Costs (US\$/bushel)	Full Cost (US\$/bushel)	Export Price (US\$/bushel)
Wheat	5.31	0.10	0.82	6.24	3.50
Soybeans	6.14	0.15	0.69	6.98	4.93
Maize	2.81	0.06	0.54	3.41	2.28
Rice	8.64	0.17	9.85	18.66	14.55

Practices.”⁹ Table 1 outlines 2001 production costs, trade subsidies and export prices. Ironically, the producer and exporter receive less from the sale because of the reduced price. “In 1998 U.S.-based multinational companies sold U.S. wheat abroad at an average price of \$34.99 per metric ton (\$1.43/bushel) below the cost of production. U.S. wheat exports totalled 28,332,000 metric ton in 1998, which means that companies sold the wheat at a discount worth a total of \$963,288,000 (almost \$1 billion).”¹⁰ Common arguments to maintain agricultural subsidies cite the need to protect family and small size farms. Contrary to this theoretical belief, in 1999 80 % of farm payments were received by the top 24% producers. Table 2 reflects the breakdown of payment distribution.

	Gross Sales	Percent of Total Farms	Average Payment Received	Percentage of Total Payments Disbursed
Small Farms	< \$50,000	76%	\$4,141	14%
Medium Farms	>\$50,000<\$249,000	17%	\$21,943	41%
Large Farms	>\$250,000	7%	\$64,737	45%

source: General Accounting Office Farm Programs Report GAO-01-606, 2001

United States and European Union agriculture and export subsidies continue to be under international scrutiny. The World Trade Organization (WTO) through the General Agreement on Tariffs and Trade (GATT) monitors international trade activities. Current U.S. agriculture and exportation policies will need to be renegotiated if they wish to meet the rules outlined by the Uruguay Round Agreement on Agriculture.¹¹

Ultimately, the losers in agriculture trade war are the poor in developing nations. Food security is comprised of a household or communities ability to grow or procure enough food to sustain themselves. In most parts of sub-Saharan Africa, citizens experience what is commonly referred to as the 'hunger gap'. This is the period prior to harvest when grain stores are completed and the household does not have the cash needed to purchase food. Paradoxically, grain depletion is accelerated when families sell their reserves to pay for medical, educational or other household needs. Grain reserves will also be commonly used as the seed for the coming crop. Thus, hunger is commonly not a problem caused by lack of food rather from the lack of cash.

Agriculture in the Developing World

“Food is our common ground, a universal experience” James Beard

The debate between food supply and populations may be as old as humans have been having arguments. Thomas Malthus’s *An Essay on the Principle of Population as It Affects the Future Improvement of Society* may have been the first social and economic writing on carrying capacity. Is food security (or lack there of) really a production problem? Is it just a distribution problem? Is it even an economic question? Or rather a political one? Regardless of the answer, finding a sustainable solution is what is needed. For the populations that experience hunger on a regular basis, agricultural development is one of the only forms of economic development they have. For the vast majority of sub-Saharan Africa, maize, millet, sorghum, rice, beans, peas and certain tubers comprise a household’s primary diet. Except for the tubers, these are the primary commodities imported in as both food aid and commercial purposes. In addition, wheat is routinely imported and has been found to replace more traditional carbohydrates in several West African countries.¹² African farmers cannot produce these crops at a price low enough to compete with import sales, thus there is no incentive to grow more than is needed for the household. Initially, this may sound stable – farmers grow what they need. Upon further examination, it becomes apparent an important ingredient in food security is still missing – cash. Farmers still need to make money to provide all the other items common in life (health care, education, clothing and transportation).

Popular economic development programs encourage farmers to enter the reactive market of high value commodities, flowers, spices and produce desired by the western world. These exportables are slowly replacing commodities previously favoured as an

economic development tool (coffee and cotton). Thirty years from now, ‘sustainable’ development programs will be encouraging the same farmers to grow a new exportable product while the western world continues to suppress the price of wheat, maize, rice and the other commodities listed above.

The answer to this problem may be out of the scope of this paper. Farmers can follow conventional farming practices, utilizing synthetic inputs and hybrid seeds in an attempt to boost production yields. The two obvious problems with this scenario are the dependency on external inputs, and the cash they require, and the stifled price farmers receive on the open market. There are many options to correcting this problem but most require the participation of national and international governments (stopping export dumping, supporting internal market structures, and creating alternative sources of income). Unfortunately, the poor of developing nations have a minimal voice. Therefore, sub-Saharan farmers would be best served by tapping into their indigenous knowledge, teaming up with the agro-ecosystem contingent and providing their own food security by expanding their genetic resources.

Agriculture and Biodiversity

“If you are planning for a year, sow rice; if you are planning for a decade, plant trees; if you are planning for a lifetime, educate people.” Chinese Proverb

Organizations such as the United Nations’ FAO are teaming with traditional environmental organizations such as World Wild Life Fund, Nature Conservancy and the United Nations’ Environment Programme to address the loss of biological and genetic diversity. Traditionally

Fig. 2: Loss of Agricultural Biodiversity

- ◆ Annual loss of agricultural genetic resources: 1-2%
- ◆ Loss of agricultural genetic resources since 1900 – 75%
- ◆ Annual loss of domestic livestock breeds: 5% (6 breeds/yr.)
- ◆ 7000 apple varieties were grown in the last century in the U.S.. Today, 85% or 6000 varieties are extinct

thought of only as loss occurring in remote tropical landscapes caused by human disturbances, loss of biodiversity is becoming more anthropocentric. Botanists and agriculturists are realizing the extreme loss of genetic resources due to globalized agriculture systems. Figure 2 highlights current levels of biodiversity loss in regard to agriculture. With the loss of genetic diversity, all species are more susceptible to disease and pests. A diverse genetic base is important to both the developed and underdeveloped world. Many modern varieties and higher yielding species were created from ‘wild’ species. “They are at the root of modern agricultural innovations, because they are the raw materials on which breeders depend to develop improved plant varieties and animal breeds and to respond to unexpected shocks, such as climate change and evolving human needs.”¹³ For example, in the late 1960’s, researchers developed barley varieties resistant to powdery mildew. The germplasm came from traditional varieties grown in North Africa, Ethiopia and Southern Asia. Powdery mildew threatened the U.S. barley crop from 1967-1974. A potential loss of \$200 million was prevented.¹⁴

From a health and food security perspective, utilizing traditional food crops or ‘wild/found’ crops can make the difference between remaining healthy and requiring food aid. In traditional food insecure locations like Southern Sudan, donor organizations such as United States Agency for International Development (USAID) and the World Food Program (WFP) are studying incorporating traditional food crops into the current food aid equation.¹⁵ Southern Sudan is a unique example in that the citizens have been living in a war zone for 18 years. Food insecurity is caused by conflict, people are unable to plant and harvest crops because they are routinely displaced. Warring factions have used this as a tool to promote regional insecurity – villages are raided during the harvest or at the

beginning of the planting season. Most traditional agriculture crops require some form of maintenance, weeding, thinning, etc. Many wild harvest or traditional food crops do not require the level of care as do introduced species. Standardized feeding programs are not realistic due to the nature of the situation. Relief agencies do not encourage the creation of displacement camps because 1) they are easy targets and 2) they are not a viable answer a long-term problem. Sudan historically has a rich agriculture base. Indigenous people have utilized wild and native crops for centuries. In 1994, donor agencies began a survey of all traditional and wild food crops, their nutritional content and preparation. By working with local populations and encouraging cultivation of traditional food crops, donor agencies help create a more food secure population while decreasing the need for imported foods. Table 3 is an excerpt from a South Sudan Indigenous Food workshop held in 2001. It is well documented that humans do not utilize a significant portion of plant resources available to them. Currently humans commonly consume 150-200 plant species for food although 10,000 – 50,000 species are edible. Astonishingly, only three species of rice, maize and wheat supply people almost 60% of the calories and protein derived from plants.¹⁶

“Crop genetic diversity is not just a raw material for industrial agriculture; it is the key to food

	Cultivated	Kcal	Wild	Kcal
Calories/100g				
	Sorghum	353	Mixed Wild Grains	380
	Ground Nuts	567	Sclerocarya birrea	669
			Nymphea sp.	389
Protein/100g				
	Ground Nuts	25.8 g	Sclerocarya birrea	28.3 g
	Cabbage	2.09 g	Amaranthus sp.	4.8 g
Iron/100g				
	cabbage	1.3 g	Gynadropsis gynandra	10.8 g

source: The Potential of Indigenous Wild Foods, USAID 2001

security and sustainable agriculture because it enables farmers to adapt crops suited to their

own ecological needs and cultural traditions. Without this diversity, options for long-term sustainability and agricultural self-reliance are lost. The type of seed sown to a large extent determines the farmer's need for fertilizers, pesticides and irrigation."¹⁷

Conclusion

"It is not the horse that draws the cart, but the oats" Russian Proverb

On a global scale, the current U.S. agriculture and foreign development programs are counter productive to themselves as well as most environmental programs and domestic economic wealth. For example, the U.S. government wants to secure the financial viability of a farm. In order to reduce costs or create incentive programs they offer subsidies based on amount produced [paid for with taxes]. This creates a surplus of commodities that are either sold overseas or bought by the federal government for domestic and international food aid programs. The producer is able to sell at a reduced price because he/she has already received remuneration from the subsidy. The producer/exporter receives less from the sale. Thus, international market prices for these commodities have been suppressed thereby creating a disincentive program for farmers in developing nations to grow for local markets. Foreign governments can purchase commodities on the international market cheaper than it's own citizens can produce it. Most developing countries rely on their agriculture sector for 10-40% of their GDP. Ironically, foreign governments need to acquire and then depart with hard currency (US\$) to purchase commodities. Conversely, a majority of the rural population does not have the cash needed to purchase the imported food because there is minimal employment. Commonly, international donors, including the U.S., will step in with economic, including agriculture, development programs or in extreme situations, food aid and feeding programs. In many cases, rural populations must

resort to environmentally damaging activities (illegal sale of resources, draining of wetlands for high yielding agriculture lands and other unsustainable agriculture practices) to generate economic resources. Again, donor agencies and NGO's may step in to implement conservation programs. These activities are implemented through taxpayer funds (in the case of U.S. funded projects).

This example can be expanded to include grim food security situations (famine); severe land degradation and loss through industrial development and population pressures; and civil unrest due to economic frustration. Although a simplified version, this example outlines the interconnectedness and interdependency experienced in an increasingly globalized economic system. Issues of just distribution, allocation and scale will continue to fester until the root causes, no matter how distant, are addressed. U.S. agriculture and export subsidies are utilized to solve our own internal economic problems. Whether looked at from a neo-classical or ecological economic perspective, the system is inefficient and harmful to those it is attempting to help both in the U.S. and abroad.

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Appendix I: United States Department of Agriculture Foreign Assistance Service
Agriculture Export Assistance Programs

- ◆ Farm Security and Rural Investment Act of 2002 Public Law 107-171
- ◆ Public Law 480 (P.L. 480)
 - Title I: provides financing of sales of U.S. agricultural commodities to developing countries and private entities. Financing provided on concessional terms, with credit terms up to 30 years.
 - Title II: donation program used in both emergency and developmental assistance.
 - Title III Food for Development: government-to-government food assistance grants to least-developed countries to support development. Currently inactive.
- ◆ Food for Progress
- ◆ Farmer – to – Farmer Program
- ◆ Section 416(b) of the Agricultural Act of 1949
- ◆ McGovern – Dole International Food for Education and Child Nutrition Program
- ◆ Export Credit Guarantee Program (GSM-102)
- ◆ Supplier Credit Guarantee Program (SCGP)
- ◆ Export Enhancement Program (EEP)
- ◆ Dairy Export Incentive Program (DEIP)
- ◆ Market Access Program (MAP)
- ◆ Foreign Market Development Cooperator Program
- ◆ Quality Samples Program (QSP)
- ◆ Technical Assistance for Speciality Crops (TASC)
- ◆ Emerging Markets Program