Agricultural Issues and World Hunger



- Stephanie Babcock
 - Ginny Dejong
 - Meghan Marsters
- Nathan Whitehead
 - Patrick Hobohm
 - Peter Nylander

The Gaia Theory

According to the Gaia Theory, the biosphere will respond to human activities by homeostatic actions that modulate or dampen the environmental changes that are occurring.



What is Gaia?

- Gaia was named for the Greek Goddess, earth's mother.
- Theory says that the Biosphere as a whole regulates the conditions of life toward the optimum. The Biosphere behaves as if it were a single living system, a super organism.

- What it means for us:
 - The extreme view; if it's necessary for preservation of a living planet, the perpetrators of damage (i.e. humans) could be eliminated or their influence curtailed.
 - □ *Example:* AIDS

The Bare Necessities

Our response to the Gaia theory could be made up for us; essentially we have a choice to make control the population growth to a sustainable level or Gaia (Mother Nature) will do it for us.



Population Rising

- In the United States in the 70's and 80's, farmers were encouraged to plant crops "fencerow to fencerow" as many thought mass starvation was around the corner.
- The increases in populations account for the "feeding the world" mentality that has lead to the promotion of agriculture development
- In recent years, populations have been growing the fastest in countries with the least food available, and slowest in countries with abundant food.
- The limit of human population is drastically increased when the QUALITY of life is factored in; not only the amount of food, but accessibility, type and acceptability per culture being fed.

Population Growth Rate

- World population is currently increasing by 203,800 people everyday
- Based on immigration and fertility, as well as mortality and emigration.



$\label{eq:population} \mbox{Population Growth Rate} = \frac{(\mbox{Birth Rate} + \mbox{Immigration}) - (\mbox{Mortality Rate} + \mbox{Emigration})}{\mbox{Population Size}}$



Feeding the Growing Masses

- The world's agricultural systems rely substantially on increasing use of fertilizers. But now, the world's farmers are witnessing signs of a declining response curve, where the use of additional fertilizer yields little additional food product.
- Because of industrialization leading to loss of agricultural land, population growth, and the demand for more meat instead of grain as incomes rise, China is projected to need to import 240 million tons of food annually by the year 2030. Yet, total world agricultural trade is currently just 200 million tons of grain or grain equivalent, and that amount is decreasing as the exporting countries consume more and more of their own food products.
- Water tables on every continent are falling, as water is pumped out at far greater rates than rainwater can replenish in order to provide irrigation for agriculture.



What Do People Eat?

Most people live on a diet based on one or more of the following staples:

□ Rice

Wheat

□ Maize (corn)

Millet

Sorghum

Roots and Tubers (potatoes, cassava, yams and taro)

Animal Products (meat, milk, eggs, cheese and fish)



Sources of Dietary Energy Consumption %



Staple Foods of Selected Regions

Near Eastern region

- □ barley
- 🗆 lentil
- 🗆 rye
- wheat

African region

- millet
- sorghum
- wheat
- 🗆 yam

- South American region
 - 🗆 cassava
 - potato
 - □ sweet potato
- Central American and Mexican region
 - 🗆 maize
 - potato

South African Exports of Millet



South African Imports of Millet



India Exports of Barley



India Imports of Barley



Madagascar Exports of Maize





Turkey Exports of Lentils



Turkey Imports of Lentils



Madagascar Exports of Green Coffee





World Hunger & Trade

The Globalization of Agriculture and its Implications

Trade Agreements have Facilitated the Globalization of Agriculture

- GATT~General Agreement on Tariffs and Trade
 - □ Signed in 1947
 - Never ratified
 - □ Replaced in 1994 by WTO

WTO (World Trade Organization)

- □ <u>WWW.WtO.Org</u> the World Trade Organization (WTO) is the only international organization dealing with the global rules of trade between nations. Its main function is to ensure that trade flows as smoothly, predictably and freely as possible.
 - Established in 1995, 150 Countries are members
- NAFTA (North American Free Trade Agreement)
 1994, U.S., Canada, Mexico
 All tariffs eliminated by 2010

How does this affect world hunger?

"The true source of world hunger is not scarcity, but policy; not inevitability but politics" ~12 Myths about world hunger

Do we have enough food?

- The world has enough resources to supply each person with 1.5 times the amount of food they need every day.
- 78% of children who are malnourished under 5 years of age live in countries with food surpluses.

So why is there a hunger problem????

\$\$\$\$\$\$\$

Prices paid for food are determined globally while the cost of food is determined locally.

Since the WTO was established, world hunger has increased

Export crop production has become the focus in many agricultural societies.

International corporations control food resources

Is this affecting America??

The end of agriculture in the American portfolio~ Steven Blank

- Supermarket chains buy from whoever has the lowest price
- Development of "Economic Food Chain"
- Land use is becoming more valuable for purposes other then agriculture

□ Agricultural subsidies are inefficient????

Since NAFTA enacted, the agricultural sector has decreased from 26.8% to 16% = loss of employment

"Leaders must address the globalized system of agricultural production and trade that favors large, corporate agriculture and export oriented crops while discriminating against small scale farmers and agriculture oriented towards local needs"

NON-PRODUCTIVE USE OF AGRICULTURAL LAND

AND HOW IT HAS CONTRIBUTED TO POVERTY AND WORLD HUNGER

The Causes of World Hunger are closely tied to Poverty

ISSUES SUCH AS:

1.)TOBACCO INDUSTRY
 2.)COFFEE PRODUCTION
 3.)BEEF INDUSTRY

LEAD TO PEOPLE BEING UNABLE TO PRODUCE OR AFFORD FOOD

The Issue

- In the past as well as today developing countries are used to supply more affluent nations with CHEAP resources and agricultural products.
- The majority of large scale tobacco, coffee, and beef production is done in countries that we would consider to be developing.
- Countries with high rates of poverty and malnutrition, and poor health care.
- Countries where agricultural lands would be better used to grow food rather than cash crops to be exported to wealthier nations.

- Often times farmers have no choice of Ag techniques used or knowledge of alternate practices.
- Larger industries control the entire production of its product yet assume none of the initial risk.
- According to DESER (a Brazilian rural affairs research organization) the price per kilo of Brazilian tobacco has remained at \$1U.S. for the past seven years.
- The same tobacco produced in the U.S.A goes for \$4U.S.

The Tobacco Industry

- Most small tobacco farmers have contracts and an obligation to sell their product to large tobacco corporations.
- Farmers often fall into debt to the tobacco companies because of the high start up costs as well as more obligations to purchase pesticides and fertilizers produced by affiliates of the tobacco companies.
- Many times traditional farming techniques are replaced so that they can produce more product. Which doesn't always work out to the benefit of the farmer. These new practices often times lead to...
- 1.) **Deforestation** forests are often clear cut in order to create farmable land.
- 2.) Erosion- valuable nutrients and top soil are lost as a result of the loss of forest.
- 3.) Extreme water use- inefficient irrigation as well as cultivation in direct sunlight increases water consumption.
- 4.) Exposure to pesticideslack of regulation and use of harmful or toxic chemicals has created a variety of health issues amongst farm hands, as well as degradation of soil and water quality.

*The use of there children as free labor has exposed entire families to harmful chemicals

Coffee Production

- 10.6 million hectares of land world wide are used for the production of coffee beans.
- While coffee production is up 61% in the past 40 years, prices have dropped 57% in the same amount of time.
- Pesticides are often used which causes the insect populations to fall and stops nutrient cycling in the soil.
- Pesticides not only cause soil degradation but also contaminates fresh water supplies.

So how does that contribute to poverty and world hunger issues?

- With coffee prices at close to what they were 40 year ago, more and more land must be farmed.
- Prior to shade grown coffee this land was often clear cut out of rainforests.
- Without sustainable land practices the crop will inevitably fail putting farmers further into debt.
Beef Industry

- The production of beef is an extremely resource reliant industry.
- In order to get around the price of production many companies use cheap land and resources in developing countries.
- There is about 1.3 billion cattle world wide and they occupy almost ¼ of the earth's land.
- In addition to land use; livestock also use a substantial amount of water and grain for feed.
- Approximately 1/3 of the world's grain is fed to livestock.

Feeding the world with sustainable farming



Global Sustainability

Global sustainability denotes a development that meets the needs of today without compromising the ability of future generations to satisfy their needs.



Economic Globalization

The problem we have faced from economic globalization is the intensifying unequal distribution of employment and income.



Which means that people don't have money or access to the distribution of food. This makes it extremely difficult for some parts of the world to sustain and flourish.

Hunger facts

The World Bank states that the world food supply in 1994 could have fed 6.4 billion people so hunger stems not necessarily from lack of food, but also for economic and political reasons. The world produces enough grain to feed every person at least 3,500 calories a day yet 800 million people in the world are hungry (Toler, 2000). Fifteen percent of the world's population are chronically undernourished (vanWijk, 2000).Certain groups are hit the hardest by hunger including women, children, people in rural areas and those living in underdeveloped nations. Three fourths of people who are hungry live in Asia, Africa, or Latin America



Biotechnology

- Biotechnology holds tremendous possibilities for the developing world. The use of high-yielding, disease and pest resistant crops will have a direct bearing on improved food security, poverty alleviation and environmental conservation.
- These GMO's will hopefully produce more yield on less land. This will increase the overall productivity and will give developing countries a means to sustain themselves and reduce world wide hunger.









- Have the possibility of allowing poverty stricken and under nourished countries to produce crops to hopefully sustain themselves and surrounding areas. Reducing the amount of distribution from huge producers.
- In theory GMO's should reduce world hunger but a lot of the problem resides in the ability of the country to sustain their self and have access to the proper capital and technology. Which is creating a barrier for developing countries.



Agriculture

Problems:



- □ Loss of open spaces for crops
- Pollutants
- □ GMO's side effects?
- □ Growing population

Solutions:

- ✤Technology that allows more harvest per acre.
- more environmental regulations
- ♦GMO's tested and longitudinal studies
- Personal green houses so families consume less (Growing Spaces)

http://www.geodesic-greenhouse-kits.com/

Consumption

Problems
 Growing population
 China and India
 United States
 Natural resources

✓ Regulate the amount of consumption world wide, make countries more self sufficient

 $\checkmark \mbox{Decrease}$ the amount of waste

✓ Research and development to find better yielding more efficient crops that still hold high nutritional values.







Problems

World cannot sustain much longer with current habits.

Pollution carries over to production of crops and food.

Also contaminates areas that could be used for Solutions: agriculture.

o Increase the environmental regulations.

o Research and development into more efficient machinery to help keep pollutants out of the food chain.

o Higher emission standards for countries.

o Bigger penalties for polluting environment.







Sustainability

- Countries that can sustain themselves will be able to reduce the transportation and distributions costs associated with importing and will allow them to sustain surrounding areas.
- This will hopefully spread out the reliance on mass produced crops to a more individual approach of sustainability. Ultimately reducing world hunger.







- World Food Program:
 - Branch of the United Nations, formed in 1961.
 - Assists countries that are in need of food assistance from war, draught, or any other reason.
 - Distributes more food than any other international organization.
 - both emergency relief programs and long term assistance programs.



World Food Program:

- Over the past four decades, WFP has invested about
 \$28 billion and more than 47 million metric tons of food
- In 2005, the WFP aid reached 73.1 million people caught in humanitarian disasters.
- Funding comes primarily from governments but is increasingly funded by private donations.





- USAID: U.S Agency For International Development
 - Founded in 1961 USAID was created under executive order of the Foreign assistance program.
 - Is the principal U.S. agency that assists foreign countries from disasters.
 - Headquarters are in Washington D.C. but has field offices located globally



- USAID: U.S Agency For International Development
 - Is an independent federal agency that receives foreign policy guidance from the Secretary of State.
 - □ Supports:
 - Economic growth
 - Assistance with agriculture and trade
 - Global health
 - Support of Democracy
 - Conflict prevention
 - Humanitarian assistance
 - Education



USDA; Foreign Agriculture Service:

- Founded in 1953 to promote the export and sale of U.S. farmer's products on a global market.
- □ Also has programs for international assistance and education



World Hunger: Assistance Programs USDA; Foreign Agriculture Service:

- Focuses on:
 - Improve foreign market access for U.S. products
 - Build new markets
 - Improve the competitive position of U.S. agriculture in the global marketplace
 - Provide food aid and technical assistance to foreign countries



Other USDA programs:

Food for Progress (FFP)

U.S. agriculture products provided to developing countries and emerging democracies committed to introducing and expanding free enterprise in agriculture

Food for Education (FFE)

donates surplus U.S. agricultural commodities for use in school food and pre-school nutrition programs in

developing countries



World Hunger Hot Spots



Resources

- <u>Contemporary Issues in Animal Agriculture</u> Third Edition, Peter R. Cheeke
- http://www.morning-earth.org/Graphic-E/Bal-Biosphere.html
- http://en.wikipedia.org/wiki/Population_growth
- http://www.populationmedia.org/issues/issues.html
- http://faostat.fao.org/DesktopModules/Faostat/WATFPri mary/watf.aspx?PageID=360
- www.wto.org
- www.foodfirst.org
- www.worldhunger.org

- www.globalpolicy.org
- www.citizen.org
- www.pusod-us.org
- World Health Organization
- Food and Agriculture Organization
- Global Issues, www.globalissues.org
- www.fas.usda.gov
- www.wfp.org
- www.usaid.gov