



## **AGRIBUSINESS PERSPECTIVE # 1**

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## **The End of Plenty – The Global Food Crisis \***

### **Wake-Up Call**

In 2008, rapidly rising food prices were a wake-up call for Planet Earth. Between 2005 and 2008, the price of wheat and corn tripled and the price of rice rose five-fold. Food riots took place in more than twenty countries and an additional 75 million people found themselves in poverty. In stark contrast, the world's farmers reaped a record grain crop in 2008. This contrast drove home the message that the globe's food reserves were running down. Global food consumption has exceeded global food production for more than a decade. Global food stockpiles fell to 61 days of worldwide consumption in 2007, the lowest on record.

High food prices are a sure sign that there is not enough to go around. This impacts the poorest people the hardest since they typically spend 50-70% of their income on food.

Even though 2009 food prices have fallen in tandem with the global economic melt-down, they are still near record-highs and the low stock-piles, rising populations and flattening yield curve remains.

### **A world eating more and better**

Three main reasons for the global food crisis can be identified:

Firstly, continuing exponential rises in global population are again putting food resources under severe strain, as has happened at certain previous points in human history. Malthus already pointed out in 1798 that population growth occurred at a geometric rate while agricultural production was increasing at arithmetical rates. The point is that, since Malthus's time, the world has added six billion people to its population. From 1950 to today, the globe has experienced the fastest population growth ever.

Secondly, due to much applauded development in China and India, these countries' people are improving their living standards, moving up the food ladder. Per capita pork consumption in China went up 45% between 1993 and 2005. However, it takes five times more grain to get the equivalent amount of calories from eating pork as from simply eating grain itself. Ten times, when consuming grain-fattened US beef.

Even China, the second largest corn-growing nation on earth, cannot grow enough grain to feed all its pigs. The shortfall is largely made up by imported soybeans from US and Brazil. Brazil is one of the few countries able to materially expand its cropland. However, this often happens at the expense of rain forests. Between 1980 and 2000, more than 50% of new cropland in the tropics was cleared at the expense of rain forests. At current rates, world meat consumption is expected to double by 2050.

When the world last reached such food imbalances, more than four million people died in the Bengal province of India.

*\* Summary of an Article by Joel K Bourne, Jr, National Geographic, June 2009*

### **1.1 The First Green Revolution: Long Term Sustainable Gains?**

The Green Revolution came in the mid 1960's when US Nobel laureate Norman Borland and his fellow crop scientists introduced a revolutionary new generation of grain and 'miracle rice' seeds.

These new seeds, in combination with synthetic fertilizers, plenty of water and an absence of weeds and insects, enabled farmers to increase their yields three and four-fold. India's government followed with abundant support in the form of subsidized canals, fertilizers and other help. India has never experienced famine since and the world's grain production more than doubled over the same period.

The 1960's Green Revolution however appears to have run its course. Yield growth has flattened since the mid-1990s and water tables have dropped dramatically in areas such as India's Punjab region, supposedly on account of over-irrigation. Researchers have pointed out that four decades of intensive irrigation, fertilizing and pesticides have led to the loss of thousands of productive agricultural land through Stalinization and water-logged soil. There have been persistent, worrisome reports about increasing incidences of various forms of cancers among Punjabi residents, linked by some research reports to water contamination from pesticides and fertilizers. In addition, the high and increasing cost of synthetic fertilizers became a serious financial burden to many small farmers, leading to wide-spread financial stress.

In 2008, a major global study initiated by the World Bank and the UN's Food and Agriculture Organization consulted some 400 agricultural experts around the world and called for a paradigm shift in agriculture towards more sustainable and ecologically friendly practices. The study pointed to the perceived 'Achilles Heel' of the 'traditional green revolution' – being dependent on synthetic fertilizers derived from fossil fuels. Monocultures have been underlying the ability of few farmers to feed many citizens. Monocultures need a large quantity of fossil-fuel based fertilizers and fossil-fuel based pesticides. The era of cheap fossil fuels has come to an end. It is seen as irresponsible to encourage farmers toward dependence on fossil fuels.

Against the above background, a shift has started, albeit from modest foundations, to "agroecology" or "sustainable agriculture". The underlying idea is that the focus should be less on maximizing grain yield gains at any cost, and that more attention should be given to the environmental and social impacts of food production. The point is made that small-scale, biologically diverse farms can produce more food with fewer fossil-fuel based inputs. The use of compost rather than natural gas-derived fertilizer increases organic content in the soil, sequester carbon and holding moisture.

## **1.2 Which Green Revolution for Africa?**

Africa is the continent where wise choices between (or combinations) of the varying 'green revolutions' may well be of vital importance to humankind. The 1960's agricultural revolution passed the continent by, for various reasons linked to lack of infrastructure, corruption and inaccessible markets. Agricultural yields in fact declined in Sub-Sahara Africa between 1970 and 2000 while the population increased dramatically, leaving an average 10 million ton annual food deficit. Given its current low yields and vast tracts of untilled, arable land, this is the one continent where food production could be improved dramatically to help feed nine billion mouths on the planet in 2050.

There are moves afoot to change the agricultural yield landscape in Sub-Sahara Africa. These moves are not necessarily in the same direction. The Rockefeller Foundation and the Bill & Melinda Gates Foundation have been promoting and funding enhanced plant breeding and fertilizer distribution among African farmers and local centres of agricultural knowledge. A network of 'millennium villages' are being established as role models in the application of such improved crop technologies combined with community upliftment. In a parallel initiative, the Malawian government in 2005 financed aggressive distribution of subsidized, hybrid corn seed and fertilizers to its smallholder farmers. The 'Malawi Miracle' saw the country moving from a 44% corn deficit in 2006 to a 18% surplus in 2007. The next year saw a 53% surplus and exports to Zimbabwe.

But concerns remain around perpetuating the same dependency on fossil-fuel based fertilizers and pesticides that have led to long term yield stagnation and environmental risk in Asia in the decades after the first green revolution.

There are demonstration projects, even in Malawi, pointing in a different direction: In the northern Malawian village of Ekwendeni, there are no hybrid corn seeds or free fertilizers. Rather, the Soils, Food and Healthy Communities Project distributes legume seeds, recipes and technical assistance towards growing nutritious crops such as peanuts, pigeon peas and soybeans. These crops enrich the soil by fixing nitrogen while also enriching children's diets. The overall project results are in many ways comparable with those of the Millennium Villages.

### **1.3 Wild Cards: Bio-Techology and Climate Change**

As the world finds itself on the brink of similar imbalances as it experienced in the 1940's and 1950's, there is a growing school of thought believing that a second green revolution will come through biotechnology. Plant breeders are believed to soon be able to modify the genes in corn and soybean plants so as to produce new plant varieties with higher yields, reduced fertilizer needs and drought tolerance. Some believe that yields of corn, cotton and soybean could double by 2030. However, there are also many doubters that point out that visible progress on this path has been elusive thus far and that the desired outcomes may take considerably longer to realize than originally predicted.

Climate change may yet upset the achievements of either of the alternative productivity green revolutions. The worst-case scenario for Southern Africa projects is a possible drop of 47% in the vital corn harvest by 2030, as a result of rising temperatures and shifting rainfall patterns, concurrent with persistent population growth.

#### ***Agri-Vie and the Green Revolutions***

- *Rising food demand and prices support the investment case for Agri-Vie – financially and developmentally*
- *Improving the productivity and viability of food companies and other agribusinesses in Sub-Sahara Africa can help to make a difference to local and global food security*
- *Although Agri-Vie does not itself target farming as a major focus area for investment, the fund has meaningful opportunities to influence farming practices by and around its investee companies:*
  - *value added investee companies often own or operate a core of own primary production;*
  - *many investee companies interact with large groups of outgrowers involving thousands of small holding farmers;*
  - *some investee companies are involved in the business of farming inputs such as seed, fertilizers and equipment.*
- *Through its participation in the governance of investee companies, Agri-Vie is able to influence farming practices towards sustainable models*
- *The Agri-Vie investment team is actively seeking out opportunities to support bio-dynamic farming practices, for instance through targeting organic fertilizer producers for investment*