

Food security in a crowded world

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Climate change and Food security

Some weeks ago I was in Arusha in Tanzania, as I stood at the foot of the majestic Kilimanjaro mountain, my friend Anate, a local farmer, pointed at the snow-capped peak of this magnificent mountain and confirmed that over the last 20 years, more than one third of its snow and ice had disappeared (evaporated in the tropical heat) and that the Kilimanjaro might be snow and ice-free at the end of next decade.

Then he turned around and pointed at his fields where the maize crop was devastated by drought. No rain for prolonged periods causes serious food problems in the region and hunger and starvation will increase in the coming months. Arusha, as many other regions in Africa and Asia, clearly show the devastating effects of global warming and climate change on the food security for millions of poor people.

Medium-term agricultural outlook

The OECD-FAO Agricultural outlook 2009-2018 reports that in 2009, world agricultural markets are characterized by a reduction in commodity prices following their rapid rise over the 2006-08 period.

There is an ongoing discussion on the evolution of retail food prices which have come down but not as quickly as international commodity prices, and with considerable regional variation. With other words, the farmers received the lower prices and the retail trade cashed the higher profits. An expected economic recovery, renewed food demand growth from developing countries and the emerging bio-fuel markets are the key drivers underpinning agricultural commodity prices and markets over the medium term.

The issue of food security is high on the political agenda as evidenced by the number of recent high-level summits, including the first ever G8 Agriculture Ministerial Conference in April 2009 and the forthcoming World summit on Food security in Rome , in November.

The G-8 + in July in L'Aquila issued a special statement on the importance of improved Food security in the world, earmarking \$ 20 billion for agricultural development in developing countries. The Netherlands signed this statement.

Much of the discussion is about the capacity of the agricultural sector to meet the rising demand for food now, but also longer term. Is there more **land** that can be brought into production? Can existing agriculture be more **productive** while becoming more environmentally **sustainable**? Will there be enough **water**? What will be the effects of **climate change**? There are no clear answers to these complex and connected questions but in the following I will attempt to give at least partial answers and connect the issues of food security, climate change and sustainability.

Crises

Today's economic and financial crisis overshadows other crises the world has not yet solved.

Last year the food and energy crises, with sky-rocketing price- increases for food and oil, manifested themselves in riots and shocks about new scarcities. The climate and environmental degradation crisis is manifest all around us and armed conflict and terrorism is causing crises in particular in Africa and Asia. The global crises we experienced in the recent past and still experience today have different effects on different people.

The financial crisis hits everybody, but mostly the rich. Shortages and high prices of food and energy, hit mainly the poor and as a consequence, sooner or later, the poor will hit the rich.

It can be expected that the economic crisis will be resolved by 2011. However it is highly likely that, given the persistence of the underlying drivers, the Food crisis is here to stay for a long time.

One billion hungry people

The Food crisis has created, between 2007 and 2009 **additionally**, one hundred million hungry people.

At present we count about one billion, **one thousand million human beings** that are chronically hungry.

Seventy-five percent of them live in rural areas and half of them are smallholder farmers, unable to produce enough food to feed their families, let alone the hungry people in the growing cities. Focus on the hundreds of millions of smallholder subsistence farmers to increase their productivity and ensuring **fair** market access for their produce is the key to food security for the poor.

10 days ago at the World Food Prize Symposium in Des Moines, Iowa, Bill Gates said: *quote* "Three-quarters of the world's poorest people get their food and income by farming small plots of land. So if we can make small-holder farming more productive and more profitable, we can have a massive impact on hunger and nutrition and poverty. Melinda and I believe that helping the poorest small-holder farmers grow more crops and get them to market is the world's single most powerful lever for reducing hunger and poverty" *unquote*. The Gates

foundation already gives hundreds of millions dollars for investment in smallholder farming. Governments only give promises to improve food security.

Food security exists when all people, at all times, have physical, social and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life. Despite the fact that Food security is regarded a basic Human Right, about 20 % of the world population lives in a permanent state of Food **insecurity** .

The Global Hunger index, indicates in red, the countries where the situation is extremely alarming, in brown where the situation is alarming and in yellow where the situation is serious. Red means that more than 30% of the population is starving.

May I ask you to close your eyes for 10 seconds and think about what food security means to you?

In these 10 seconds, somewhere in this world 3 people died because of malnutrition; 25.000 per day; 10.000.000 per year and half of them are children below the age of 5.

The rhetoric question arises: “have we forgotten our Millennium Development Goal promise; to halve hunger in the world by 2015?”

It is my firm opinion that:

*“It is morally unacceptable that 1 billion people in this world, get sick of too **much** food and suffer from: obesity, cardio vascular disease, diabetes and cancers and that at the **same** time, in this **same** world about 1 billion people are starving because of **lack** of food, which renders them physically and mentally incapacitated, denying them the minimum requirements of human dignity”.*

Furthermore:

“It is dangerous to neglect one billion poor and hungry people, as they are a source for armed conflict, terrorism and the spreading of HIV and TBC” and finally:

“It is economic nonsense to exclude 1 billion potential consumers and producers”.

An unstable and unsustainable world

A world in which one billion people have too much of everything and one billion are deprived of anything is an **unsustainable** and **unstable** world. Unfortunately there is sufficient evidence that political insecurity and food insecurity often go hand in hand. Most of the so-called “failed states” are in need of external food supply because of civil strife and conflict and many of these failed states are home countries for terrorist organizations.

Hunger and malnutrition is not just a moral, safety or economic dilemma for the bottom one or two billion people in this world, that have to live on \$ 1,- or \$ 2,- per day.

The total picture for food security is bigger and more complex and affects all of us.

Paul Roberts and Lester Brown in their recent books: “The end of food” and “Plan B”, describe this convincingly.

Underlying drivers of the Food crisis

Professor Gordon Conway (Imperial College London) the author of the compelling book “The Doubly Green Revolution” makes it crystal clear that the underlying drivers of the **Food** crisis are chronic and getting worse.

Underlying is a chronic crisis which is getting worse; the drivers:

1. Rising populations (6.5 -> 9 billion)
2. Rising per capita incomes
3. Growing demand for livestock products
4. Growing demand for biofuels
5. Increasing land scarcity
6. Slowing of productivity increases in agriculture
7. Climate change
8. Increasing water scarcity



Over the next decades, demand for food will rise considerably because the global **population** will grow from 6.7 billion now, to at least 9 billion by the middle of this century. Most of this population growth will take place in the developing world. The bulk of the population growth will thus accrue in the regions of the world least able to absorb large increments of people.

The FAO estimates that food and feed production has to increase at least with 70% to fulfill the demand by 2050.

Economic growth in these countries will create higher incomes for hundreds of millions of people and there is sufficient evidence that these people will

consume more food and **change their diets away from grains** to increased meat consumption.

Diets rich in meat will increase overall food/feed demand exponentially, because to produce one kg. of meat, on average 4 kg. of grain are required (1 kg beef=10kg grain). More and more land will be devoted to produce animal feed crops, when largely vegetarian populations in Asia and Africa begin to approach western dietary habits. This is very worrying as most of the world's readily available arable land is already being farmed and much of what remains is marginal land requiring high fertilizer inputs, or worse tropical forests are cut down to provide for new agricultural land.

The heavily subsidized **bio-fuel** industry is causing additional stress on scarce land resources (e.g. corn in the USA and palm in Malaysia and Indonesia).

(imagine, that the corn used to produce bio-ethanol to fill **one** tank of an SUV, could have fed **one** person for **one** year).

Because of urban development, **land is becoming scarce** and huge areas of fertile soil will be not any longer available for food production.

In the past **productivity increases** per hectare of agricultural land, through higher-yield in seeds, mechanization, irrigation and better fertilizers, could feed the growing populations and lowered the price of food.

However these constant productivity increases, so spectacular since the so-called green Revolution in the sixties and seventies, seem to level off and respond to the law of diminishing returns. **Decline in investments** in agricultural productivity in the recent past is certainly responsible for this diminishing returns. New technologies and better use of land are required to keep up the food supply with increasing demand.

Climate change leading to changing rainfall patterns, droughts and floods will affect food production and early signs indicate that in particular developing countries will be affected negatively, resulting in increased hunger and poverty. A study for the Massachusetts Institute of Technology forecast that yields of the main Indian crops would decline by 4.5-9% over the next 30 years because of climate change. The FAO in its recent "Food security Outlook" is even more pessimistic and estimates that harvest-yields in developing countries could longer term diminish with 20-30% due to climate change.

The agricultural community will certainly respond to higher demand, in the first place with higher prices with dramatic negative effect on the living standards of the poor who spent 80% or more of their income on food. More food will certainly become available, but will it be enough to feed the billions of new consumers and can poor people in developing countries afford to buy it?

The spectacular rise of food production in the past took three critical advantages for granted: cheap energy (fertilizer, pesticides, transport, cooling, freezing), abundant water and a stable climate. Unfortunately, the days of cheap energy are over, climate change is already taking its toll in many countries and maybe the most worrying, farmers are running out of **water!**

Fresh water will become scarce and create serious problems for agricultural production. Agriculture consumes about 70% of all fresh water in the world and water resources are depleting practically everywhere in the world. Water tables are falling fast, rivers are drying out, aquifers are depleted. Some scientists project that by the middle of this century, water will be more expensive than oil. The combination of climate change (less “green”-rain- water on the right spots) and depletion of (“blue”) ground water will seriously jeopardize food production in the near future, in particular in the developing world.

No substitution for Food

Markets adept to scarcity by price increase and substitution with similar goods. But there is no substitution for food.

Once we deplete the resources on which food production depends- primary soil and water- we have no synthetic version of food.

It is therefore likely that population growth will outpace food production **as we know it** and that the poor in this world will bear the consequences most severely. Was Malthus right after all?

Not only gloom and doom

Thus it should not only be gloom and doom to be forecast. Also the OECD-FAO Agricultural Outlook 2009-2019 is rather optimistic about the medium-term food-supply in the world and suggests:” that production could be increased considerably.

The three critical supply factors - land, productivity and water - do not appear to pose insurmountable barriers to increasing agricultural production medium term. However, there are substantial risks that must be managed and substantial investments that must be undertaken to ensure future food security. Moreover, growing societal concerns about the environment, intensive farming, use of GM technology, food quality, etc. will increasingly play a role in shaping the structure of agricultural production over the medium-term”. Professor Rudy Rabbinge from Wageningen University, confirms that enough food can be produced to feed the world now and in the future. The technology is there but should be applied, in particular in Africa. It will cost billions of Dollars in investments, but it is possible.

Dr. Norman Borlaug, the recently deceased winner of the Nobel Peace Prize, said the same with different words. *Quote* ”World peace will not be built on empty stomachs or human misery. It is within the world’s technical and

financial power to help end this human tragedy, **if** we set our hearts and minds to this task” *unquote*. Please notice his disclaimer by the use of the word **if**. We can now conclude that:”**we have the technology, we have the money, but we do not have a mindset and compassion to take serious action”**.

Mental models and change of mindset

Thus a burning question arises:”is it really possible to become more resource efficient, investment-minded and compassionate, to properly feed the whole world population now and into a distant future?” The answer to this question is that nobody knows for sure! But we have a **choice**.

Dennis Meadows and his co-authors claim in their recent book, “Limits to growth?-The 30 year update”, that the choice is between different **mental models**.

One mental model says that this world for all practical purposes has no limits. That mental model will encourage business as usual and take the human economy beyond its limits. The longer term result will be collapse. Another mental model says that there are real limits to growth, but there might be just enough time, with no time to waste, to solve our predicament. There might be just enough energy, raw materials, money, environmental resilience and enough human virtue to bring about a planned reduction in waste and greed and thus our ecological footprint. This should lead to a **sustainability revolution** to create a much better world for the vast majority of mankind, with sufficient food to feed 10 billion. A world that will take real action to eradicate hunger and poverty and stop climate change.

With other words;

there can be **enough for everybody’s need, but not for anybody’s greed**.

However it implies that the rich western world should change its dietary habits and reduce its ecological footprint dramatically, not only to offer a liveable world with enough healthy food to our own grandchildren,

But also allowing for economic growth, sufficient nutritious food and an increasing ecological footprint in developing countries, in order to enable **them** to offer **their** grandchildren a dignified human life, free of want.

Universal declaration of Human Rights 1948

Interesting to think that that was just what the world promised itself in 1948 when formulating the Universal declaration of Human Rights.

“Everyone has the right to standard of living, adequate for the health and wellbeing for himself and of his family....”

Will the World be capable to realise that promise after **one-hundred** years?

Aerdenhout, 22 oktober 2009

