



THE SUSTAINABILITY SERIES: FOOD SECURITY

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Waging war on hunger in our hearts and minds

WITH a carbon dioxide level at 379 parts in a million and rising, which is the highest concentration of carbon dioxide in the atmosphere in 420 000 years, the Earth is entering a "Heat Age" as evidenced by hotter temperatures, rising sea levels, shrinking polar ice caps, melting glaciers and the die-outs of species unable to adapt.

In a dramatic gesture designed to bring to the attention of world leaders, ahead of the Copenhagen Climate Change Conference in December, that people around the world seek a commitment to action that will reduce greenhouse gas emissions for the short- and long-term benefit of the planet, more than one billion people in more than 1 000 cities will be turning off lights tomorrow evening (Saturday, March 28), 8.30pm to 9.30pm South African time, during what has been termed "Earth Hour".

This bold collective call to action, intended to send a powerful message to the leaders of the world, will vividly highlight the concern many of us feel about the danger we are in – and with good reason, for the faster the world's climate changes, the greater the risk to sustainable living conditions.

According to the Intergovernmental Panel on Climate Change, an increase in global air temperature of 1.4 to 5.8°C is predicted by 2100, with a mean sea level rise of nine to 88cm by the same year.

Such radical changes are likely to have enormous impacts on the global environment, with human societies facing new risks, pressures and challenges – especially in terms of food security.

For as climatic zones shift in response to changing weather patterns, bringing more rain to some areas of the globe and less rain to others, farm belts will change location, with agriculture thriving in some parts of the world while declining in others.

Some important food producing regions will be lost while others will be gained. This will mean that global food supplies will be even more unevenly distributed than at present, which could have serious social, economic and political implications, as the balance of world power shifts in relation to food surpluses and shortages.

Global warming in Africa

According to a report from a coalition of UK aid agencies and environmental groups, the African continent has experienced an average temperature rise of 0.5°C over the last 100 years with temperatures in some areas, such as a part of Kenya, which has become 3.5°C hotter in the past 20 years, having risen much higher.

This increased average temperature has seen arid or semi-arid areas in northern, western, eastern and parts of southern Africa becoming drier, while equatorial Africa and other parts of southern Africa, such as Mozambique, are getting wetter, making many of the problems that Africa is already facing much worse.

Although climates across Africa have always been erratic, scientific research conducted for the report indicates "new and dangerous extremes" with climate change being labelled an "unprecedented threat to food security", with freak storms, increased average temperatures, altered wind patterns, increased wind and water erosion problems, changed patterns of humidity and rainfall, and decreased access to water causing "possibly cataclysmic change".

The Western Cape is an important stone fruit-growing area which produces nectarines, plums, peaches and apricots, and it is estimated that during this century annual rainfall could decrease by between 15% and 25%, with temperatures increasing by two to 6°C.

Less rainfall and warmer temperatures would impact negatively on fruit production in the area with abnormal flower bud development, delayed foliation, fruit drop and poor fruit set affecting the canning, drying and fresh fruit consumption industries.

A pattern of high winter temperatures would result in poor chill accumulation for certain commercial deciduous fruit cultivars, which have a medium to high chilling requirement, resulting in crop losses.

This trend would mean financial hardship for both large-scale commercial and emerging small-scale farmers alike, as well as less sustainability of the deciduous fruit-growing industry and related agribusiness of the region. This would in turn create loss of jobs with attendant socio-economic problems. It would also affect foreign exchange earnings.

Land competition

On the continent of Africa more than 350 million people



PHOTOGRAPH COURTESY OF VALLE D'AMIGLIA

ple are on a collision course with nature as they depend directly on the environment for their livelihood, and with a staggering 73% of agricultural drylands on the continent thought to be degraded, food crisis is a very real threat.

While land degradation results from natural factors, such as climatic variations which cause flooding and drought, human activities contribute in a major way to lost productivity of land.

Soil is formed by the slow and complicated process of weathering rock together with the interrelationship of water, air and living organisms. It is effectively the product of decay but it is also the humus of life for it forms the basis for the food chain upon which we are reliant for our survival.

With only 13.5% of South Africa's land surface being suitable for food production, topsoil is a resource of immense importance, yet every year more than 460 million tons of topsoil is lost from poorly managed agricultural lands by wind and rain.

Productivity of land is further compromised through human activities, such as electricity generation and mining, which pollute soils with heavy metals and acid mine drainage, and through the dumping of toxic waste which causes potentially hazardous chemicals to leach into soils.

Also, an estimated 34 000 hectares of productive land is lost to agriculture every year for purposes other than farming, with spreading informal settlements, housing



developments, industrial landscapes, office parks, shopping malls, recreational facilities such as golf courses and sports fields, landfill sites, road works, quarries and mines rendering huge tracts of ground unavailable for food production. By the middle of this century this could mean that there will be only 0.2 hectares per person available on which to produce food in South Africa, which is far below international norms.

Emerging industries

Compounding the competition for available land and the edible crops it is able to produce is the emergence of industries such as the biofuels industry, which converts maize, soya, canola and other oil seed crops into bioethanol and biodiesel.

Projected to achieve 75% of the country's renewable energy target of over a billion litres of biofuels by 2013, through a 4.5% biofuels market penetration of petrol and diesel, biofuels are nevertheless controversial.

From a positive perspective biofuels could help to reduce carbon emissions and dependence on imported crude oil. They are also likely to create a larger market for grain and oil seed producers, especially emerging farmers.

However, by diverting land from food to energy crops and by changing the dynamics of supply, the biofuels industry could become a threat to future food security because, as maize and other oil seed crop hectares are increased due to a demand for biofuels, areas planted to food crops will decrease, reducing biodiversity while causing the price of maize and other food crops to rise steeply, making traditionally staple foods such as maize unavailable to, or unaffordable for, many South Africans.

Equally controversial in terms of food security are genetically modified foods. Farmers have been broadening the genetic base of plants and animals for centuries through selection and breeding practices that retain desired characteristics such as size potential in cabbages and fertility and beef quality in cattle.

Genetic engineering differs from conventional natural breeding practices; however, because it crosses the species barrier by, for example, taking a gene from a pesticide and placing it into a plant such as a melon. It is for this reason that controversy exists around the whole idea of genetically modified food.

Because the translocation of genes between unrelated species is still an imprecise science, with unpredictable and undesired results sometimes being revealed in animal testing, genetic engineering has raised legitimate concerns with regard to important issues such as ethics, human health and the emergence of new plant diseases and virulent insect pests.

The biggest concern, however, is that GM foods have never been tested on humans.

Water and food production

The United Nation's Millennium Development Goals pledged to eradicate extreme hunger by 2015.

However, as it takes at least 2 000 litres of water to pro-



duce enough food for one person for one day, with irrigation currently accounting for 70% of all water withdrawals worldwide and some countries already using more than 40% of their renewable water resources for irrigation, this may not be feasible in the foreseeable future as it has been estimated that by 2030 the world will require 55% more food.

Apart from significantly increasing our percentage of the earth's net primary productivity (total terrestrial food supply), which means that there will be less space for plants, to grow increased food production to feed a burgeoning human population will mean a near doubling in water consumption from the 7 200m³ used in crop production today to 13 500m³ by the middle of this century – this at a time when the average per person supply of water worldwide is expected to drop by a third.

Compounding this food/water conundrum is a preference for a Western-style diet that is driven by urbanisation and economic growth, which results not only in a higher per capita food intake but a richer, more varied diet.

As it requires more water to produce meat, milk, sugar and oils than to produce vegetables, grains and cereals, with, for example, one kilogram of beef requiring 13 000 litres of water, one kilogram of rice needing 1 400 litres of water, and a kilogram of wheat and potatoes requiring 1 000 litres and 100 litres of water respectively to produce them, we could well be eating ourselves into a thirsty future.

The sea as sustainable provider

Located at the confluence of three great oceans, the Indian, Atlantic and Southern oceans, South Africa's coastal waters with their warm Agulhas and cold Benguela cur-

rents are an exceptionally rich marine environment, with a great diversity of ecosystems and marine species constituting an enormously valuable national resource.

Historically, South Africa's fisheries have been well managed with the result that comparatively we have one of the healthiest fisheries in the world with record catches of some fish species such as pilchards, a small pelagic (top) fish used for canning and fish meal, producing an average of more than 200 000 tons of fish per year over a number of years.

Worldwide, however, fish stocks are declining with more than 76% of harvested fish stocks being fished at maximum levels or overfished and, with many fish stocks, including high-value line fish species such as seventy four, kabeljou and red steenbras, having been severely depleted, South Africa is following this trend despite exponentially increased effort and the technological sophistication of GPS positioning and echo sounding equipment.

As a key source of protein, South Africa's fisheries contribute significantly to our food supply, economy (including coastal tourism) and national health. For many fishing communities they are a major source of income and employment.

However, fisheries are dynamic with fluctuations occurring as a result of complex and diverse factors ranging from human pressures brought about by illegal and unregulated fishing and "technological creep", to environ-



PHOTOGRAPHS COURTESY OF THE POLYSTYRENE PACKAGING COUNCIL, GARETH KNIGHT AND DE WETSHOF VINEYARDS

mental factors such as damaged habitats and sea temperature changes from El Niño and other climatic events.

In a bid to keep fish stocks at a sustainable level and the industry viable, authorities have reduced the total allowable catch for many commercial species and drastically cut overall fishing quotas.

Fluctuations in pelagic or surface fisheries, such as pilchards, sardines and anchovies, which form enormous shoals which are scooped up in finely-meshed purse-seine nets, are immediately noticeable with a fast recovery rate of two to three years which can be built-up through stringent regulation.

However, a decline in demersal or bottom fisheries, such as hake, sole and prawns takes longer to be noticeable with recovery taking as long as five to 12 years.

Some long-lived species, such as red roman and red sturgeon, take decades to recover from unsustainable yields and, if exploited beyond their regenerative capacity, some fisheries, such as the north Atlantic cod, never recover.

Almost a third of all fish harvested, 27 million tons in total, is dumped as by-catch each year, which is a staggering waste of marine life.

Because demersal trawling of the seabed is an indiscriminate method of fishing, high levels of by-catch may be caught along with the targeted species.

In this way, for every ton of prawns caught on the Tugela Banks up to four tons of fish are dumped, and a sole trawl could result in finfish, sharks, rays, squid and octopuses being caught and discarded as by-catch which is adversely affecting the biodiversity of our oceans.

Hake, which is highly regarded internationally, is trawled from the seabed, with South Africa exporting to Europe on a daily basis.



Because it is cannibalistic, juvenile hake makes up to 80% of the adult hake's diet. The small size of this "recruitment stock" makes it commercially less valuable than the adult stock and as such it has previously been discarded as by-catch at sea but, because the hake fishery has declined with large fish being less available, small pre-breeding stock is now finding its way into our supermarkets and onto our plates.

Although aquaculture has been the fastest-growing food production system over the past decade, providing 50% of the world's fish which has filled the gap between the worldwide demand for fish that has grown due to increased human population and fish stocks that have seriously declined, it is not a quick fix solution to providing a sustainable protein resource for the majority of South Africa's people.

As an emerging industry, aquaculture with its specialised marine offshoot, mariculture, currently produces high-value species, such as abalone and oysters, which are too expensive for wide-scale domestic consumption and, although research and development is underway to produce a wider array of high-value marine species, such as kabeljou, white steenbras and yellowtail, the production methods are still in the commercial pilot stage. In the meantime, we will have to look to the sea with its wild fish stocks to be a sustainable provider.

Food security is a highly complex and emotive issue for enough food now could well be too little food tomorrow. Besides taking better care of the land and sea, South Africa's war on hunger will be waged in our hearts and minds with our collective will hopefully paving the way for enough food for everyone in the future.

What you can do

- Join or support an environmental organisation – there are a host of organisations to choose from according to your particular interest. Newsletters and magazines will keep you updated while your membership will increase lobbying power.
- Become involved in your local community with projects such as food-growing initiatives in communal food gardens – look for opportunities to provide assistance, share knowledge and contribute resources.
- Buy gardening and other supplies, such as seeds, from NGO resource centres so that your spending power can help to educate and train others.
- If possible, buy in bulk to reduce packaging and lobby companies to package their products in environmentally friendly, recyclable packaging.
- Support local farmers, small retailers, organic markets and other community-based suppliers, which will help small business development.
- Ensure your household's food security by growing your own organic produce and help others to do the same even if it is in roof gardens, window boxes or old tyres – in this way it is possible to eat "fork to fork".
- Plant fruit trees in your garden for year-round fruit harvesting.
- Invest in a rainwater tank and install some bird-nesting logs.
- Cut out chemicals and recycle your edible garbage into compost for soil regeneration.
- Consider becoming a vegetarian – it will help to reduce animal suffering, environmental damage, such as desertification and deforestation, and methane build-up while increasing land availability for the cultivation of grains.
- Become an informed, concerned and active consumer – when eating out or buying seafood make sure that your choices come from sustainable fisheries. Ask where the fish is from, what it is and how it was caught. You can also send an SMS with the name of the fish species to the Southern African Sustainable Seafood Initiative (SASSI) on 079 499 8795.
- Shop ethically – only buy goods, products and services that contribute to the environmental and social good.
- In terms of labelling, use your consumer power to lobby supermarkets for GM food labelling and look out for fish products with the international Marine Stewardship Council (MSC) label which means that the species has been certified as a sustainable catch.
- Only buy imported goods if you cannot find them in South Africa.

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- ❖ www.wwf.org.za/sassi

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Inspired by you

Switch off your lights. Switch on a new mindset.

Show your commitment to the wellbeing of our planet. Join 1 billion people worldwide for Earth Hour by switching off your lights on 28th of March between 20:30 and 21:30. www.earthhour.org.za