

## **THE NUMBERS JUST DON'T STACK UP**

There are about 7 billion people on the planet today and the United Nations estimates there will be 9.2 billion in 2050 – just 37 short years from now. Furthermore, the UN estimates that food production will have to rise by 80% by 2050 to meet the needs of that higher population. The 80% increased demand is made up of 31% from there being 31% more mouths to feed and 49% because of a change to more meat-eating in the underdeveloped world. (Increasing affluence will lead to better diets, and since it takes 9 pounds of wheat to produce 1 pound of meat there is a requirement to increase crops by 49% to improve diets.) It is not clear whether the 80% takes account of people living longer, thus eating for longer, and for the epidemic of obesity sweeping the world – presumably obese people eat more. So the UN's required 80% increase in food production by 2050 may be an underestimate.

So how can an 80% increase in food production be achieved? The benefits of the post-war “Green Revolution” have largely been taken; that is, the application of the fertilisers Nitrogen, Phosphorus and Potash is already worldwide and little more benefit can be expected from that quarter. Hybridisation of crops to produce higher-yielding varieties will be a help, but seems unlikely to improve yields on the scale required. Better irrigation in some parts of the world could be a help but is unlikely to lead to a massive increase in crops. Very little extra land can be made available since lots of the rain forests have already been destroyed and there is political pressure to stop further destruction since it is the rain forests which release the oxygen which we need to breathe.

Indeed, there are other factors which are likely to DECREASE food production in the next 37 years. Increasing amounts of food crops are being used to produce fuel for cars, despite that being highly immoral with 3 million children dying every year because of malnutrition. The USA is the largest producer of maize but already half their maize is being converted into fuel. Also, valuable agricultural land is being used for the expansion of the world's cities; already half the world's population is urbanised and one can see cities expanding even further. So with food being diverted into fuel production and a reduction in land availability because of urbanisation it will be even harder to achieve an 80% increase in food production by 2050.

And what about climate change? Those saying the climate is not changing have clearly lost the argument. Virtually all the world's scientists in the field agree that man's emissions of greenhouse gases are causing increased temperatures. Governments are committing vast amounts of money, when money is supposed to be scarce, to non-polluting methods of generating electricity, for example: wind turbines in the sea and on land; solar electric power generation; the harnessing of tidal and wave power; and the building of new nuclear power stations. Governments have been convinced that climate change is happening and are doing something about it. They are trying to stop the global rise in average temperatures exceeding 2 degrees Celsius (but are likely to fail). Above 2 degrees it is feared that there could be a runaway in temperatures as snow-covered tundra in the Arctic is exposed, warms up, and emits vast amounts of greenhouse gas. The rise in global temperature causes a rise in sea level as seawater expands and ice in the polar regions melts, so valuable agricultural land in coastal areas will be lost because of flooding and saltwater contamination of the soil. The effects of all this on food supply can be, and probably will be, dramatic. The International Food Policy Research Institute has estimated that climate change will result in average crop yields in South Asia being halved for wheat, 17% down for rice and 6% down for maize by 2050 from 2000 levels. That is a catastrophic state of affairs and makes the UN's requirement for an 80% increase by 2050 look like the UN is living in cloud cuckoo land.

Climate change is also causing increased variability in weather. Extreme droughts and floods cause serious decreases in crops. 2012, with almost continuous rain during vital parts of the growing season caused me to have much reduced crops of vegetables generally and virtually no stone fruit, which caused me much anguish. Increased temperatures cause more water to evaporate from the surface, then down it comes in the form of increased rain. But other parts of the planet can be parched at the same time. Climate variability causes serious problems for farmers and reduces crops for hungry mouths.

Can the Fifth Cavalry come riding to the rescue? Can man's ingenuity find a way to produce 80% more food? The Great White Hope seems to be genetic engineering of crops. So far, such crops have been produced more efficiently, leading to increased profits for farmers, the manufacturers of herbicides etc and the producers of genetically-modified seeds – but the amount of food produced has not shown much of an increase. Great hopes are pinned on producing crops which can grow in parched conditions and in soil which has been contaminated by saltwater, but there are no results so far. There is therefore some doubt as to whether genetically-modified plants will have greater crop yields to aid in the required 80% increase by 2050.

So the numbers just do not stack up. So what will happen? Food will become short as the population rises from 7 billion to 9.2 billion. Therefore the price of food will rise. People in rich countries will be able to pay the higher prices and people in poor countries will not. Mass starvation is likely. Just after World War Two people in the UK spent about 50% of their income on food whereas they spend only 11% today. How would people in the UK react to having to spend 50% of their income on food once more? It may come to that. One can see UK farmers cultivating what is currently marginal land since it will be profitable to do so. One can see a mass movement to “growing your own”, with lawns being dug up and vastly increased demand for allotments. Sounds like heaven to me since I will no longer be in such a small minority, but I am not sure how people living in our cities could grow their own on the scale required.

Throughout the above I have ignored the “Elephant in the Room”. An 80% increase in food supply requires an 80% rise in the use of the fertilisers Nitrogen, Phosphorus and Potash. There are vast amounts of potash in the ground so no problems there. Ditto Nitrogen, which is produced by the oil industry. But resources of Phosphorus are finite and running out. The UN's estimate of a required 80% increase in food production by 2050 is most unlikely to be achieved. The numbers just don't stack up.

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