



**SOLVING THE TRIPLE CHALLENGE TO AGRICULTURE:
TRADE, NEW TECHNOLOGIES AND FOOD SECURITY**
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One might rightly ask why the three topics of trade, food security and new technology might be 'challenges' for agriculture and by extension food and fibre production. This paper examines all three for their significance and impact on ensuring a food secure world. The views are those of the author.

Let's take Trade. Global trade deals such as those falling under the remit of the WTO have long been difficult to negotiate particularly those encompassing agriculture. And the same goes for Regional deals. The US has pulled out of the newly agreed TPP and wants to re-negotiate NAFTA. There is also the similar and rather bizarre situation of the United Kingdom wishing to pull out of the world's largest trading block, thinking it can quickly negotiate new trade deals with other countries and world areas. The world's global trading system is not in good shape. It is under attack from all sides; by those campaigning for local protectionism, by arguments against 'globalisation' for example and for reasons of political posturing. The argument is often that local jobs and employment need to be protected by restricting imports – while frequently at the same time promoting and subsidising exports to other markets; a contradiction in itself. Many 'new' politicians are now taking these arguments up with unrestricted enthusiasm which will have many nefarious effects if they persist.

Vast quantities of agricultural commodities are traded around the world. There is a general tendency to think things are humming along and products produced in one area of the world are readily available in other places. However, recent statistics show there has been a tendency for trade flows to stagnate. Historically, agriculture has proved to be the most difficult of all sectors for which to reach agreements. Probably because it is still the global sector which employs most people. The ILO and FAO estimate that although continuing to fall, some 33% of global employment is in agriculture. It is also the sector where average wages for those in employment are lowest. But all the argument and contention forget one key thing. Food cannot just be produced anywhere. Production is highly dependent on available land, geography, water, sunlight and moderately temperate climates. Therefore there is a natural limitation on what can be produced and where in the world. If we want to keep the world fed, it is absolutely necessary to ensure that trade in agriculture and food products is facilitated, not hindered. This is particularly so with the growing tendency of global populations to concentrate in large dense cities and heavily populated countries.



And then Food Security. We eat to live. If there is not enough to eat, the consequences are dramatic. History has amply demonstrated that lack of sufficient food leads to starvation, population unrest, an increase in crime, and in the direst of cases, famine and death. There have been many causes of food shortages both natural, such as unusual climatic events like drought or the reverse, and man-made, such as war, poverty or restrictions on production and trade. Thus the moral onus is to ensure there is sufficient food production and that it is available where needed, i.e. to ensure food security.

Currently, global agriculture systems if allowed and encouraged, could probably produce sufficient food to largely ensure food security. However all is not rosy and much produce does not get to where it is and will be needed. There are also ongoing and significant changes such as in population diets with an increasing global trend to increased animal protein consumption and the swelling demands on agriculture as an energy source. This is accompanied by greater overall levels of food consumption, particularly as populations become more prosperous. The predicted population growth will also place extra demands on agriculture and food production systems. Population growth is still accelerating. The United Nations recently upped its predictions for world population to 9.8 billion in 2050 from today's level of 7.6 billion. This is an increase of some 30% over the next 30 years with roughly 83 million people being added each year. This is a huge challenge for agriculture and food production systems and will be exacerbated by a desire for higher individual levels of consumption and dietary changes. It thus behoves us to take all measure possible to ensure food security. No more land will be produced and ongoing measures to protect what we have increase the challenge.

Which brings us to New Technologies. The standard of living of populations has above all depended on food supply and nutrition and in turn, much of this has depended on the close relationship between new technologies and agriculture. One of the most significant of all technological developments was 'the new husbandry' which occurred in the late middle ages in the low countries and which spread slowly eastwards and to England however almost not at all in France. The three principal elements of the new technique were new crops, stall feeding of cattle and elimination of fallowing, which combined, led to a dramatic improvement of agriculture productivity. In later years followed the development of artificial fertilizers and fungicides such as Bordeaux mixture and the mechanisation of many tasks including in the textiles sector (see 'The Lever of Riches' by Joel Mokyr, Oxford University Press, 1990). Such developments continue apace in modern times.

At the same time, there was and is much resistance to new technology in agriculture. One of the enduring reasons has been the fear of resultant job losses also exacerbated by the proportion of the population involved in agriculture and their poverty and low remuneration levels. The Luddite riots of the early 19th century are ample demonstration. This resistance still continues today; with an extra element. There is a growing trend for some populations, generally those in prosperous environments, to want greater varieties of food produced as in the historical past and without using modern techniques. This is fine as far as it goes and for those who can afford it. However it should not be at the cost of either overall general levels of food production or diminished nutrition levels for everyone else especially in less prosperous countries.



Looking to the future and given all the constraints, the focus must be on 'producing more from less'. As in the past, the answer can only come from applications of new technology while respecting conservation and sustainability needs. Modern techniques which conserve water such as micro-irrigation and hydroponics, specially modified specialty resistance crops, highly specific chemical crop protection agents, satellite assisted crop production, improved farm machinery and many others will assist in the task and help achieve the demands of the challenge. The list is almost endless and undoubtedly there are other techniques which have not yet been invented and which will allow greater production from the same input. All must be allowed to proceed while respecting general health, safety and nutrition requirements however my own first-hand experience with biotechnology crops does not bode well.

The Challenge is great but surmountable!

Dr. Kenneth Baker is Chairman of the World Agricultural Forum, a not-for-profit institution established for scientific, educational and charitable purposes. Dr. Baker has long and extensive Corporate General Management responsibilities in the chemical, agricultural, pharmaceutical and related industries in Europe, the United States and other world areas. Having studied science in New Zealand and Cambridge and management at INSEAD, he has contributed widely to the debate on the role of science in economic development, given evidence to parliamentary enquiries and chaired many government and other committees examining this same question.

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