

## The Many Challenges of the Foreseeable Future

*The following is the text of an address delivered by FDI Institute Director and CEO, Major General John Hartley AO (Retd), at the Kott Gunning Annual Business Breakfast in Perth, 28 July 2010.*

Thank you for the opportunity to speak here this morning. I want to discuss the foreseeable future and this is always a challenge. Indeed, the foreseeable future can vary from anything from two years to 50 or more years, depending on the subject.

I am very conscious of this last issue. There is little appetite in any government, Federal or State, to consider the future. Where a generation ago, we might have attempted to anticipate major changes and start to develop appropriate strategies, in most cases, today's problems are considered today.

To a certain extent, I blame this on the information age. As you recall, this was to liberate us, to have us understand what was happening, and to allow us to influence policies that would shape our future.

Has this occurred? I am not sure. Certainly, we are more knowledgeable or at least have access to more information than ever before. But are we any the wiser? Are we any happier? Somehow, I don't think so. Instead, we are bombarded with information, some of which is propaganda or disinformation or just plain wrong. Of course, it is often difficult to determine the truth, even assuming that such a thing exists.

All of us recognise that we live in the age of spin. No profession is exempt. We receive a version of the truth – a frequently distorted version. We also have a media that follows its own line of reasoning. Or that concentrates on immediate, topical issues, that are selectively chosen for their sensationalist appeal and that lead to confusion and uncertainty. All this can be quite demoralising and confusing.

From my perspective, the media has little appetite for publishing articles that look to the future. Nor is it helpful that much of what is published by academics and scientists rarely gets out of the scientific journal. It is also frustrating that for every ten scientists who provide evidence that the globe is warming, much – if not more – attention will be given to someone who says there is no such thing. To make matters worse, this is frequently done without any reputable scientific evidence.

Now, my organisation, Future Directions International, researches four areas, all with an eye to the future. I shall briefly attempt to discuss some of the major conclusions that have resulted from this research. Please remember that we are looking to the future when we do so.

Determining the future is extremely difficult. We seldom get it right. But if we attempt to analyse the future consistently and objectively, there is every possibility that we will not be as surprised as we would be if we did not go through this process.

Let me start by saying something about food and water security. This is a significant challenge that is only now starting to receive some attention. Let's look briefly at the global dimensions of this problem.

Fifty years ago, the world had fewer than half as many people as it has today. They were not as wealthy. They consumed fewer calories, ate less meat and this required less water to produce food. The pressure they inflicted on the environment was lower. They took from our rivers a third of what we take today.

Since 1950, the area of irrigated land has doubled and the use of water has tripled due, in part, to a growing population and a stronger demand for high-protein food. It is estimated that an additional 6,000 cubic kilometres of fresh water will be required to meet global demands by 2025.

There is also the issue of city growth. Presently, 3.5 billion people live in cities. This is expected to grow to seven billion by 2050, with many living in the squalor of urban slums.

Other issues will also affect the availability of water. Contamination will be a major factor. Farm water will release chemicals and nutrients, making water unsuitable for drinking or producing fish. City water may well be contaminated with toxic organic pollutants. It is estimated that 1.5 billion people drink contaminated water and that between two and five million die each year as a result.

Of course, I have not mentioned poor farming and inadequate management: ineffective infrastructure – dams, pipes, channels and water storage; land that has been over-grazed and that is rapidly turning into desert; salt and acidity; and – of course – climate change.

In the last four decades, the amount of fresh water available has shrunk by about two-thirds, and this is expected to halve again by 2025. You may well ask if we have passed “peak water.”

Not surprisingly, with increased water stress, crop yields decline. This will cause prices to rise. By 2025, the price of rice is expected to increase by 40 per cent, with wheat increasing by 80 per cent and maize by 120 per cent. You may well ask how the poor in slums will be able to afford this.

Let me say something about China. I'll say more about this country shortly. With 22 per cent of the world's population, it has just eight per cent of the world's fresh water. Today, nearly half of China's 660 cities experience regular water shortages. Perhaps even more telling is the situation in the country's food bowl: the North China Plain. Here, some 70 to 75 per cent comes from a rapidly declining source – underground water – and all this is happening when China's population is expected to pass 1.6 billion by 2050.

Globally, it is forecast that some two billion people will face a serious water shortage by 2050.

Of course, there are solutions. Probably they fall into three categories:

1. Awareness, educational and behavioural change;
2. Solutions that require considerable research and involve science and technology; and
3. Incentives and penalties.

None of this will be easy. Farmers will be asked, for instance, to produce more food, often for less money, but will also be required to use less water, to clean it up and to make sure it gets back into the river or wetlands.

Nor is the situation any clearer when it comes to discussing arable land. The bottom line is that the world is running out of high quality soil. The availability of such land has declined from 0.45 of a hectare per person in the 1960s to 0.25 today. It is estimated that this figure will be 0.18 by 2050.

This has resulted in a new phenomenon where arable land is bought by foreigners when the expectation is that food produced in these areas will be sent to the purchasing country. For example, China has acquired 1.24 million hectares from the Philippines and some 700,000 hectares in Laos. The United Arab Emirates have acquired 900,000 hectares from land-starved Pakistan and about a third of that from the Sudan. A South Korean corporation is also reputed to have bought up to half of the arable land in Madagascar. I expect we will see much more of this.

It is also interesting to see which countries are most affected by land degradation. The worst areas, as a proportion of the world, are Russia, Canada, the US, China and Australia. If this is translated into actual primary production, then the order is Canada, Indonesia, Brazil and Australia. This is significant; Canada, Russia and Brazil are considered by many as the major food producers of the future.

Another statistic that is quite alarming is that productive land is degrading at about one per cent per annum.

Another issue, about which there is some controversy, is that of rising sea levels. The Intergovernmental Panel on Climate Change, for instance, forecasts a rise of between 20 and 60 centimetres, or eight and 24 inches, by the end of the century.

While there is much publicity regarding the impact of rising sea levels on islands, particularly in the Pacific, the impact is likely to be particularly devastating on river basins and especially on those that have large delta systems: the Ganges, Irrawaddy, Mekong, Nile, Amazon, Yellow Rivers and so on. For instance, if only half the anticipated rise were to occur, then some 15 million Bangladeshis would be displaced.

Many people point to the success of the Green Revolution, where the threat of starvation faced by one person in three fell to one person in eight. But this result, unacceptable as it was, led to a paralysing complacency and neglect with many countries reducing significantly their R&D programmes.

Climate change is a much debated phenomenon. Most people who consider the issue believe we are going through a period of global warming at an unprecedented rate in modern times. There is also recognition that, if the present rate persists to 2030, we will face a global calamity that would have

the GFC pale into insignificance. How much is human-induced probably still remains unclear, although there is considerable scientific research to suggest that it is significant.

So how do we deal with this?

From what I can tell, the only practical solution is for humanity to cease emitting gases that insulate the earth and absorb the sun's heat: CO<sub>2</sub>, methane, nitrous oxide and others. And to lock carbon into the soil, vegetation, marine sediment, rocks and deep ground water. Low carbon farming systems also need to be developed.

In summary, it is increasingly evident that we are suffering a serious decline in arable land, water, nutrients and fish. To compound the problem, this is matched by reduced levels in R&D, a failure to understand the impact of climate change and inadequate policies that relate to population numbers and energy security.

In Australia we are not immune from these challenges. We can expect our share of the global population increase. Treasury forecasts the figure to be around 35 million by 2050. Much of Australia's landscape is degraded, perhaps as much as 300m hectares of the 550m used for agriculture.

Overgrazing, over use of oil-dependent non-organic fertilisers, the draining of our wet lands, erosion, salinity, land clearing and heavy cultivation have all contributed to this. Furthermore, Australia is experiencing an increasing dryness in key parts of the continent due to changing climatic conditions and erratic rainfall. CSIRO anticipates that the southern part of the continent will become increasingly drier and hotter.

Therefore, how do we increase production of food and fibre to meet the growing global and national demand when our current approach suggests no increase at best? Nor is this helped when so much of our focus on agricultural outcomes is based on yields that provide a stated profit. Factors such as the health of the food barely rate consideration. Without question, there is an urgent need to change much of our agricultural practice, including water management.

It is also of concern to note that of the 98 per cent of our rainfall that falls on our soil, 50 per cent is lost through evaporation. Thus, the restoration of the soil structure and its ability to filtrate and retain rain water is an urgent priority.

Today, too much of our water capture, collection and storage is focussed on an end-of-pipe practice where water is distributed for consumption and agricultural purposes from the meagre two per cent that is held in dams, reservoirs and above-ground storage systems.

Front- of-pipe solutions, which is what is going into the pipe, on the other hand, promote the soil as an in-ground water sink, where at least ten times the water quantities held in our dams and reservoirs could be made available every year for soil quality enhancement and the potential for sustainable production of nutritious food. To do this, however, we must manage our landscape correctly.

We should also take note of the link between healthy soils, healthy food, healthy people and healthy communities and their positive potential to reduce substantially the cost of health provision.

Healthy soil development relies significantly on building the carbon content. Not only does a soil with higher carbon content levels retain more water, but it also promotes a living soil by enhancing soil structure, by aerating it and by increasing the capacity of roots to proliferate and to penetrate deep into the soil where bacteria, microbes and fungi are evident. Teamed with other minerals, essential nutrients and sunlight, the keys to healthier foods are provided.

Soil fertility and resilience, as well as the sequestration of large amounts of carbon, can be enhanced by understanding how these natural systems function, and by taking a holistic approach to the management of animals, plants, soil and water, as well as recreating forests and shelter woods, using minimal tillage and organic fertilisers and planning rotational grazing.

This suggests that land managers should be rewarded for their involvement in bio-sequestration of carbon which will give them a cheaper organic fertility solution and buy time to allow other longer term land management innovations to be established on their holdings.

Australia is fortunate. We may well have many of the answers. Innovative farmers, supported by good science and an understanding of the fundamental hydrology of their landscapes, may well have the solution, or at least part of it.

Regrettably, however, there is also much to suggest the opposite: a severely degraded landscape, salinity, polluted rivers and streams, less healthy animals and research that appears to be penny-packeted and, at times, uncoordinated.

There also seems to be a very large number of Local, State and Federal Government laws and regulations, not always aligned in their intent, and often interpreted in a manner that quashes innovation.

We need to orchestrate a solution based on proven leading practice in which leadership and co-ordination are the key elements. This requires:

- Setting the strategic direction and articulating a unified, co-operative plan with responsibility preferably vested in one entity.
- Communicating a clear and simple message to the public about the need to change and what the outcome should look like.
- Encouraging the adoption of sustainable practices, focussed on improved water management and creating healthy soils.

At community and regional level, the following is clearly desirable:

- Innovative land managers being supported by local councils, government agencies, training organisations and corporations to document and to demonstrate the leading practices in which other stakeholders have free and easy access.
- New education, training and mentoring support for those who wish to become new adaptors.
- Local and regional markets developing in response to public demand for products grown from sustainable methods.

I doubt we have a lot of time to manage our water and to regenerate our land to ensure the production of sustainable healthy food. But implementing change provides a huge opportunity for Australia and to also have a positive impact on global security by alleviating poverty, malnutrition and disease through the sustainable production of adequate, healthy food.

The second issue I wish to speak about relates to Australia's engagement with Asia and with China and India in particular. With regard to the former, it is almost entirely related to the export of energy and mineral products and the import of Chinese manufactured goods. With India, shortly to be the world's second most populous nation, there is as yet minimal consideration of how to engage this country.

Of course there are serious questions regarding the future of both countries.

China certainly has an extraordinary record of economic growth with average annual GDP increases over the last 20 years of over ten per cent. This growth has been dependent, of course, on relatively cheap access to materials and a reasonably assured market for its manufactured goods.

But there are serious challenges. The Communist Party's Central Committee remains concerned over the growing disparity between the newly rich and increasingly wealthy coastal mercantilist élite and the majority of the rural poor. We will need to watch 2012 closely when a major change occurs in China's political leadership. I've spoken about major food and water issues. China also faces a major labour shortage within a generation as its one-child policy will result in a reduced workforce and an ageing population.

We should also seek to understand China better and to broaden our relationship beyond that of a resource exporter. Are we, for instance, paying sufficient attention to cultural and social issues? How much about China is taught in schools? Do we have a serious policy with regard to language training?

We also need to recognise that China will not replace the United States as the major global power, certainly within a generation. Somehow we need to engage both, recognising the geo-strategic and cultural importance of Washington and our economic relationship with Beijing.

I also think we need a far better understanding of India. Our policy with India almost appears non-existent. Of course, the jury is still out. While there has been considerable economic development, and a wealthy class has evolved, there is still widespread poverty, particularly in the rural areas. Some 400 million Indians are said to be illiterate. There is a growing Maoist Naxalite insurgency. Corruption is widespread and growing. Industry is slow to adapt and emerge. The caste legacy system is still present.

In both countries there is the prospect of restive populations, revolting as their job prospects darken, social programmes are reduced, income inequalities increase and health and pension rights disappear. Meanwhile, stock markets flourish and the wealthy classes become richer. Arguably, internal dissent may be their most significant security challenge.

Many commentators have spoken of a political rivalry between India and China. The so-called "String of Pearls" theory has emerged. This suggests China is aggressively seeking to establish diplomatic ties with a number of Indian Ocean littoral states, eventually to the development of a

string of military bases. The result would be to expand China's influence, constrain India to the sub-continent and reduce American influence in the region.

Others point out that China is simply seeking to ensure that its sea lines of communication, particularly from the Middle East, are secure. After all, this is China's lifeline with some 90 per cent of its oil originating from this area.

The reality is that China has not established a single military base anywhere in the region. Certainly, it has deployed a three-ship flotilla to combat piracy in the Gulf of Aden. And while this is its longest and largest blue-water deployment, it is hardly a significant naval presence.

Of course, China spent \$US71 billion last year on its defence forces. While this is the second most significant defence budget in the world, surpassing those of the UK, France, Germany and Japan in recent times, it pales somewhat against the \$US710bn of the United States.

At least at the official level, China and India have sought to play down their differences in recent times. While the disputed Himalayan border has yet to be settled, regular meetings occur between officials. My sense is that the threat at this time is exaggerated. But tensions may arise quickly from time to time and the issue of a Sino-Indian rivalry will need to be closely monitored.

Let me say something now about energy security. We need a much clearer understanding of our energy requirements between now and 2030. We also need to understand the sources of that energy.

If we are to continue to experience global warming, then there will need to be a major effort to replace greenhouse gas emitting non-renewable energy sources with clean forms of energy. We have set national targets to do this, but I don't see much evidence of this happening.

We also have a plethora of new and emerging forms of energy: wind and solar power, geo-thermal, wave and, of course, nuclear. With regards to the latter, it is almost impossible to have an objective discussion; either nuclear is the panacea to our future or it will lead to nuclear proliferation or even result in another Chernobyl. Geo-thermal offers huge prospects but is barely known.

A challenge we face is that developing new forms of energy, at least initially, is costly. Private enterprise may not see this as a short-term profitable venture. Only government funding may start this process, and I don't see much movement on that front.

Another aspect for consideration is how we can use energy more effectively. Should we design our homes, indeed our cities, to use energy more efficiently? Is there a better means of powering our transport systems? We hear, for instance, of electric cars. But where does the source of that energy come from? Can our electricity grids cope with the increase? We have also seen the solar panel fiasco. Yet, if properly resourced, researched and managed, this could ultimately be a major source of relatively inexpensive power that did not contribute to greenhouse gasses.

The last issue I'd like to mention briefly is that of our indigenous people. They number 2.7 per cent of our population but attract a considerably higher portion of GDP.

Yet, we continue to see little evidence to suggest that employment rates are improving, that school attendance has increased, that they are healthier and that life expectancy is closing with that of non-indigenous Australians.

Instead, we note that indigenous Australians represent a significant proportion of our prison populations, that drug and alcohol abuse is widespread, that many communities feel they have had more than enough research with little to show for it, that political gestures result in little follow-up and that in some communities it is the grandparents that fill in forms as this is the last literate generation.

Do any of us have a clear sense of what we are trying to do?

It seems to me there are two schools of thought. Firstly, give indigenous people a sense of their cultural pride. This will prepare them to enter mainstream Australia with confidence based on a sense of self-worth, supported by appropriate education and training. The second approach is to have them enter the workforce as quickly as possible, suggesting that they no longer have access to a set of cultural values that were uniquely theirs. Both points of view suggest, however, that the present system of monetary handouts must stop, as it leads to widespread abuse of all kinds.

We should also recognise that this is a most fragmented society. Certainly, the American Red Indians or the Inuit were more cohesive groups. I suspect, therefore, that no one policy on any issue will satisfy all.

In conclusion ladies and gentlemen, I've touched on a number of issues that FDI is working on. All require long-term sustainable policies that in turn will need frequent amending and reviewing as they develop.

The challenges of ensuring food and water security, energy security, the transition to a low-carbon future and a sustainable, long-term engagement with Asia are high-priority. There are also other issues to consider. Do we need a population policy? Should we empower our citizens to take a more effective role in determining our future and, if so, how do we do it?

Unfortunately, we seem less willing and able to confront such issues which will affect us in the long term. Our political and media horizons are short term. Our research and development capabilities are declining. We are good at producing studies but poor at implementing their recommendations. There is little political appetite for non-party policies. Government departments do not work well on inter-departmental issues.

Yet we need to resolve all these inadequacies if we are to confront the challenges, some of which could be quite substantial, if our children are to enjoy the same happy future that we have experienced.

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