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# GROWN IN THE ACT

## FOOD SECURITY AND THE FUTURE OF CANBERRA

The case for food security to be adopted as a major principle in planning land use and development in the ACT and for a local sustainable, intensive food production industry to be established to counteract forecast declines in Australia's food production resulting from climate change.

The paper is a submission by Fusion Australia to the ACT Government in relation to planning for the future land use and development of Canberra.



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## SUMMARY

Climate change, “the greatest moral challenge of our time“, according to former PM Kevin Rudd, threatens global scale food shortages, famine, social upheaval, mass movements of peoples and wars. Australia will not be excluded, and initially its food security is likely to be threatened by extreme weather – droughts, floods, heatwaves and fires. Some scientists are warning that change is proceeding faster than forecast even two years ago.

This paper maintains that it is essential that Canberra establish a sustainable intensive food production industry around the perimeter of our city, based on hydroponics, aquaculture, irrigated crops, and in particular the new technology of aquaponics. Such an industry, in conjunction with home gardens, could grow significant quantities of vegetables, fish, eggs and other produce for local consumption. The capital investment, labour force and technological requirements can be met, provided that the idea has community support and political will.

**We recommend that the prima facie case made out in this paper be thoroughly examined by a Government appointed ACT FOOD SECURITY TASK FORCE, whose report would form the basis of an ACT Food Security Policy and Program. The ACT Government has already demonstrated commendable leadership in combating climate change by way of two initiatives: the 40% carbon emissions target by 2020, and a solar power generation program. Food security would be an appropriate addition to that list.**

## INTRODUCTION

The bottom line in relation to climate change is food.

Worldwide shortages of food are forecast for millions, even billions, of people because of a lack of water to grow it, combined with extreme and variable weather and with civil and international unrest. Australians generally have only a vague concern about this: most people believe a crisis is decades away and don't give it thought. The Murray-Darling Basin Authority draft plan released in October 2010, however, may have given a jolt to such complacency.

Fusion is an Australian based Christian youth and community organisation working since 1960 with the disadvantaged in Australia and more recently in 15 other countries. Over the past almost 20 years Fusion in Canberra has had hands-on experience in local food production by disadvantaged people, including refugees from rural backgrounds, in the growing of vegetables on two hectares of land at Lions Youthhaven on Kambah Pool Road. We know what it is possible to grow in the cool climate of Canberra. We are also a "victim" of climate change: a shortage of bore water forced us to close our horticulture operations in 2009. But we have also experienced the success of trialling the new technology of aquaponics, which is a combination of hydroponics and aquaculture raising vegetables and fish in the one system and using only 10% of the water required in the open field.

*"... I argue that the world's food supply will be the first and most important place that these great (climate) changes will be felt. Sure, the icecaps are melting. Tough on polar bears, but what does that matter to Joe and Joanne Suburbia? If the supermarket shelves begin to empty, that is another matter entirely"*

Statement by Professor Julian Cribb in a paper presented to an Irrigation Australia's Conference in October 2009. Reported in Acres Australia newspaper, Vol 18 No 1.

**Fusion's volunteers and supporters have developed the vision that it should be possible for Canberra, a city/state growing less food than any other state or territory in the nation, to grow significant amounts of food. This is not only possible but it will become essential when sooner or later, Australia is no longer able to grow as much food as it does in 2010.**

This paper outlines the need for this vision and its possibilities. While it focuses on Canberra's situation, the problem that it addresses and ways in which that problem can be tackled are relevant also to villages and towns throughout Australia and overseas. It suggests that communities can take some responsibility for their own food supplies by growing food sustainably for themselves.

This is not a scientific, peer-reviewed paper. It is based on the simple premise that the IPCC scientists are correct in their assessment that climate change is underway. What we suggest will be outcomes of the climate changes seem to us to be logical common sense: extreme weather, more heat and less rainfall means less food will be produced in our country. That is not rocket science. What we are putting forward therefore is an informed lay view that a prima-facie case exists and it merits close scrutiny by appropriate experts who can provide a better researched basis for food security policy and action in the ACT.

**The greatest need now is to raise community awareness and Government awareness of the expected crisis, to stimulate discussion and to expedite plans and policies to establish as soon as we can an extensive food production industry located around the perimeter of our city. This cannot be done in a year or two but we should be aiming to have made good headway in say five years.**

Fusion is making this submission to the ACT Government and ACTPLA in relation to planning in general and with specific reference to the Eastern Broadacre and Molonglo area developments. We shall circulate the paper to interested agencies and individuals urging that they take whatever action they can to get this matter on the public agenda.

Over recent years Fusion has had encouraging discussions with senior Government ministers and officials in relation to food production, aquaponics and resettlement of refugees. Fusion is hopeful the Government

and the community will respond positively to this paper. Recently the ACT Government set a target of a 40% reduction of carbon emissions by 2020, a decision which reflected community concern and which demonstrated initiative and leadership among administrations in Australia. It has also announced a major solar power generation program. We believe that food security is, like carbon emissions, another priority climate change issue on which the ACT community and Government can demonstrate foresight and leadership.

## **THE GLOBAL IMPACT OF CLIMATE CHANGE**

- Most scientists now consider the evidence of global warming to be convincing and that its impact on the temperature and rainfall over land and oceans will threaten water and food supplies in virtually every part of the globe. The outcome of those physical changes to the Earth's environment will be catastrophic as desperate people resort to violence and conflict both locally and internationally to obtain enough food and water to keep themselves alive.
- Well-known analyst Gwynne Dyer in his book "Climate Wars" lists potential mass movements of people from, for example, the Mediterranean area to Northern Europe; from North China to Siberia; from North to South India. Fertile ground for the growth of extremist movements and extremist governments! Dyer says on page ix of his book: "Eating regularly is a non-negotiable activity, and countries that cannot feed their people are unlikely to be 'reasonable' about it ". Australia needs to start thinking about the implications of large numbers of climate change refugees from SE Asia and the Pacific coming to our shores with nowhere else to go.
- What remains uncertain is how quickly climate is changing, and if and when it might reach a tipping point, past which any preparatory action by humans is no longer possible. Recent evidence does indicate, however, that the process is happening faster than scientists believed it would only a few years ago.

## **THE IMPACT OF CLIMATE CHANGE ON AUSTRALIA**

- Scientists expect that Australia, already the driest continent, will be more severely affected by less rainfall, higher temperatures and extreme weather than other countries.
- We have a relatively small area of land which has the fertility and water (via rainfall or irrigation) to be highly productive. Our grain and meat production comes mainly from broadacre farming in areas of low to medium but variable rainfall. Our meat production in recent decades has increased significantly with more stock being grain-fed, a practice under threat as the world price for grain increases and as feeding people becomes more necessary than feeding cattle, pigs and poultry.
- Even using improved food production methods and technologies, Australia may well find itself unable – even in the medium term - to feed its own population.
- Could Australia import food to make up local shortfalls? This might be possible in the short term, but when the time comes that most other countries are struggling to feed their own people, importing large quantities of food will not be an option. Also, the moral question arises as to whether Australia as a rich and developed nation should outbid people in poor countries.
- Two other factors will probably exacerbate the declining food production: firstly, reductions in fossil fuel supplies with higher prices for energy; and secondly, global financial crises. Murphy's Law still operates !
- **In the face of such a serious challenge to our food, water and social security, it is essential that Australia begin some serious analysis and planning to prepare for the inevitable changes. There has been "war on poverty", "war on terrorism" and "war on drugs". To constructively and effectively prepare for climate change, Australia and other countries need to get onto a "war footing" to ensure we have the essentials of life. This is one of the clear messages to come out of the Murray-Darling Basin Authority's draft plan released on 9 October 2010.**

## THE POTENTIAL FOR FOOD PRODUCTION IN THE ACT

### First of all a few premises:

- There is no quick fix, no silver bullet, no single solution and no dramatic technological or biological solution on the drawing boards which promise a radical, green revolution-like increase in food production.
- It is unrealistic to expect that we will be able to source additional large amounts of food from the local region to offset declining production further afield. The ACT has little influence on what SE NSW grows and where it will sell it. But we can and should take on the responsibility for enhancing our own food security.
- It might be possible for Australia to cut back the birthrate and immigration intake to reduce the population growth and the amount of food we need. It is also possible to reduce significantly the amount of food each of us consumes or wastes, and to improve our diets - which as a side effect would improve our health and hopefully alleviate obesity, diabetes and other problems.
- In Britain during World War 2, people had only just enough to eat but were never healthier before or since. In Cuba, the fall of communism in Eastern Europe led to drastic shortages of fuel oil, fertilisers and pesticides, exacerbated by US trade embargoes. Cubans turned to low-tech, organic, decentralised food production, even in cities and towns and now produce 90% of their own fruit and vegetables.
- There would appear to be limited scope to improve broadacre food production in the ACT, but irrigated food production is worth looking at.
- There are however a number of proven and potential technologies and approaches in relation to intensive horticulture, which can contribute to increased food production in the ACT's limited area. No doubt other technologies are waiting to be discovered or invented as human creativity and initiative responds to necessity.
- When considering the economics and the prospects of producing food in the ACT now and in the future, we need to bear in mind that food prices in future will be significantly higher, perhaps by three or four or more times. If the average price of vegetables goes from say \$4 a kilo to \$12 by 2020, and meat averages \$60 a kilo, then every sector in the production and supply chain will have to adapt to that. Some technologies and practices currently uneconomic will become viable.
- "... if you eat much less meat, much less dairy, suddenly the possibilities grow. The variations in how much land you have available and how many people you could feed all depend on what diet they eat.", as Tim Lang, Professor of Food Policy, City University, London has stated in Gwynne Dyer's book "Climate Wars" page 106.
- **An irony of the situation is that the ACT, currently producing relatively less food than any other Australian state or territory, has the potential to grow significant amounts. If Canberra has to, it will.**

### HERE THEN ARE SOME POSSIBILITIES THAT CANBERRANS MIGHT CONSIDER:

- **HYDROPONICS.** This widely used technology uses only 20% of the water and produces 10 times more food than in the open field and so does not require vast areas of space, fertile soil and reliable rainfall. See Attachment A. It does, however, require significant inputs of chemical nutrients, which need a lot of energy and carbon emissions to produce and transport. Many people are concerned about the dangers to health of such food but it is possible that ways will be found to use organic nutrients in hydroponic operations.
- Canberra has no large scale hydroponic operations at this time, but at Guyra in Northern NSW in a colder climate than Canberra, a 20 hectare hydroponic/glasshouse complex with 200 employees produces 11 million kilos of tomatoes annually, some of which are sold in Canberra. At Port Stephens north of Newcastle a hydroponic/aquaponic enterprise produces barramundi and lettuce.
- In a 2006 experiment, the Gross Market Returns for field production of tomatoes a year were \$82,385 per hectare compared with \$1,667,250 in a glasshouse. The great difference results from several factors: double plant density, higher production per plant, longer cropping time, and higher

prices for glasshouse produce. Details are shown in the table in Attachment A at the end of this paper. The figures are based on an experiment conducted by the Australian Hydroponic and Glasshouse Association (AHGA) in the Goulburn Valley in Victoria in the 2006 growing season. In relation to water use, the glasshouse used almost twice the amount of water per hectare as the outdoor field ... BUT the water to tomato conversion rate was about five times greater in the glasshouse.

- Technically and economically therefore there is no reason why much of Canberra vegetables could not be produced in the ACT in glasshouses around the edge of the city selling direct to the local population.
- **AQUACULTURE.** In SE NSW significant amounts of fish are raised on fish farms. It would seem possible to establish fish farms in the ACT "borrowing" water from the Murrumbidgee and Molonglo Rivers. Scope probably exists for fish farming in Lake Burley Griffin, and Googong, Bendora and Corin Dams. In 2005 China produced 32 million tonnes of fish from aquaculture (versus about 20 million tonnes from ocean fishing), which is about 30 kilos a year for each of China's one billion people.
- **AQUAPONICS** is a new and promising technology, which combines hydroponics with aquaculture, raising fish in tanks, in the one system. This technology merits detailed description, for which please see the next section.
- **RECYCLING CARP.** Carp is an introduced fish which is a pest in Lake Burley Griffin and waterways in SE NSW and other parts of Australia. We shall probably never get rid of it so let's see if we can use it ....and at the same time, make room for more useful fish. There is some exploitation of carp by some small businesses in NSW which process carp into fertilizer and possibly pet food. For a climate changed world, the ACT should be researching how this pest could be better utilized as fertilizer or human and animal food. To skeptics we say : with food security threatened, we cannot dismiss any idea because it is distasteful, unusual or from left field. Let us try to turn carp and maybe other pests and materials into a resource.
- **POULTRY.** Poultry raising and particularly egg production, large scale and small scale, is another potentially important enterprise capable of significant expansion, although along with grainfed beef and pork, it will have to compete with humans in the market for decreasing supplies of cereal grains. Small backyard chicken pens with four or five birds are capable of producing 25 eggs a week, enough for a family of four or more. There could also be scope for Japanese quail as a highly productive source of both meat and eggs on both a backyard and commercial basis.
- **DOMESTIC VEGETABLE GARDENS.** Idealists are sometimes unrealistic about self-sufficiency based on home gardens and a pig or two. On the other hand, thousands of backyards in Canberra are capable of growing significant amounts of vegetables, fruit, eggs – and honey! For example one square metre of fertile soil can produce \$25 worth of vegetables a year, so 40 sm can produce \$1,000 worth a year. Four hens can lay 90 dozen eggs a year @ \$5 = \$450. Add say \$100 worth of fruit from a few trees and the total is about \$1500 a year. Multiply that by 15,000 backyards and you have Canberrans growing food worth \$22.5 million at 2010 prices. More basic horticulture training and improvement of soil would be needed but we can and will do this if we have to.
- Again we refer to the role of English home gardens during World War 2, and to the productive community gardens now operating in Cuba. Let's not turn up our noses at the potential of backyard gardens, particularly if they are supplemented with aquaponic fish production : complex, expensive, high-tech solutions are not always the best or only way to go !

Already there are waiting lists for people wanting to join Canberra Organic Growers community gardens, with increasing demand for courses in home gardening, and the ACT Government planners are already reserving sites for community gardens in new suburbs.

- **IRRIGATION FARMING.** There are two potential sources of water for irrigation. The first is the recycling of sewerage water. While some people have reservations about using such water even for growing food, necessity will encourage a reconsideration. The second potential involves using some of the river water passing through the ACT that ends up in the Murrumbidgee Irrigation Area. The fact is, for example, that of every four litres that flows out of the Hume Weir at Albury only one litre actually gets to the lower Murray : three out of every four litres evaporates or seeps away during the long, hot, slow journey westward. An obvious question therefore is : should Australia perhaps be using water for irrigation closer to where the rain or snow falls ... before it evaporates ? In the ACT, topographically, flat to slightly undulating land at Pialligo, in the Majura Valley, on the CSIRO farms along the Barton Highway, and elsewhere could be highly productive if water could be got there for irrigation....and in a climate changed ACT, the cost/benefit analysis would be favourable.
- Another way to increase food production is through increasing the soil fertility of irrigated fields , (and in home gardens). This could be done by collecting the thousands of tonnes of green waste from Canberra homes, composting it and spreading on food growing areas.
- **Irrigation farming can definitely contribute to our food security and is worth looking into.**
- **NEW IDEAS, NEW TECHNOLOGIES, NEW CROPS.** In the normal course of events, things change and are improved. New machines are invented and new plants introduced. In a climate challenged world, under pressure from necessity, we shall find new ways to produce food. **But we shall find those ways sooner and introduce them more quickly if we all – the ACT community, the ACT Government, and the Public Service - give more support and encouragement to people with creative ideas and initiatives.**

## AQUAPONICS

- **We believe this new technology will come to be regarded as one of the most significant advances in food production of the last 50 years. It is directly relevant to the food security of the city/state of Canberra, and merits a detailed description.**
- Aquaponics combines the growing of fish and vegetables in the one system. All that is involved is hooking up a fish tank to a hydroponic-type system, and pumping the water with the fish waste through the grow beds where bacteria in the growing medium convert the harmful nitrites into beneficial nitrates which provide all the nutrients required by the plants. The only input is the fish food. Aquaponics uses only 10% of the water required in the open field, with virtually no waste to dispose of. The energy used in running a few pumps is very small. In fact catching water from the roof of the glass house and using solar power means the environmental footprint and carbon emissions can be virtually zero. The food produced is chemical free.
- The water use of 10% of what is required in the open field to produce vegetables (versus about 20% for hydroponics) is the general claim of Australians who have produced manuals in recent years, for example Joel Malcolm in Perth WA ([www.backyardaquaponics.com](http://www.backyardaquaponics.com)) and Shannida and Matt Herbert in Mudgee NSW ([www.aquaponics.com.au](http://www.aquaponics.com.au)).
- Any freshwater animal can be raised in an aquaponic system. In Canberra trout and silver perch would be the most popular, with a six to nine month growing period, depending on the temperature. Fish require relatively much less food than other animals. To produce a kilo of fish requires about 1.2 kilos of food, as compared with up to 8 kilos of feed to produce one kilo of beef

or pork. Furthermore, some people are now raising black soldier fly larvae and duck weed both rich in protein as a cheaper fish (and poultry) food alternative to factory produced, grain based pellets.

- Proponents of aquaponics maintain that within two or three years aquaponics systems produce more vegetables than hydroponics, and aquaponics produces fish as well which at say \$15 per kilo gives a higher financial return than the vegetables.
- **The capital costs of erecting buildings and of purchasing and setting up the equipment are relatively low, as are the running costs. The system is low-tech with pumps and timers being the most sophisticated equipment. Management of fish and plant health requires some training and vigilance but is not "rocket science".**
- Aquaponics systems can range from mini-systems on an apartment balcony, from systems for a family covering 30 square metres (the size of a double garage), to 1000 square metre systems returning say \$80,000 for a one person business, up to any number of hectares producing in the order of \$1million worth of produce per hectare per year. The 30 square metre system can produce 200 kilos of vegetables and 100 kilos of fish, worth up to \$2,000 a year.
- With an expansion of aquaculture and aquaponics, fish could become a much larger component in the diet of Canberrans, supplying animal protein as beef, lamb and pork supplies drop off.
- There are many features of aquaponics which appear to be "too good to be true". It is relatively unknown but those who have been working on it for the last few years in the USA, Canada and Australia have proved that it does live up to its promise. (For more information, google "aquaponics", "black soldier fly" and "duckweed".)
- Supported by a \$15,000 ACT Government Environment Grant, Fusion successfully trialled a 30 square metre system at Lions Youthhaven Kambah in 2007 - 09.
- Aquaponics therefore has significant implications for food production, not only in Canberra and Australia but throughout the world, in fact anywhere there are limitations on food production and threats to food security:
  - countries and areas with low or unreliable rainfall and lacking in fertile soil
  - countries struggling to provide food for people in cities and towns
  - countries with limited industrial and transport infrastructure
  - people with limited education, mechanical ability and finance.
  - people in isolated and remote areas.
  - people living in hot, temperate or cool climates.
- **Aquaponics is definitely worthy of close examination as the backbone of a large intensive food production industry in the ACT.**

*"I predict that, with increasing awareness of the advantages of aquaponics and hydroponics in political circles, where the painful economics of water use allocations are being thrashed out, there will be a very logical favouring of aquaponics and hydroponics developments. My other prediction is that this miserly water use, combined with small space needs in cities, will make urban aquaponics and hydroponics the dominant food security technologies that will emerge from this century of humankind's development."*

Geoff Wilson, convenor of Aquaponics Network Australia, Aquaponics Journal 2006.

## ESTABLISHING A FOOD PRODUCTION INDUSTRY IN THE ACT

- In addition to the potential for certain crops being grown in Canberra, we need to look at economic, and other factors, including :
- **Capital investment.** When food supply cannot meet demand and good returns are possible, private investors will be attracted to put money into the building and equipment required. The buildings and equipment required are relatively simple, unsophisticated and easy to construct, and the capital investment would be towards the lower end of the spectrum for industrial development .
- **Government funding?** Apart from the usual road, electricity and water services provided to new suburbs and some initial incentives to attract new industries to Canberra, we do not believe the Government would need to subsidise or put a lot of its own money into an intensive food production industry here.
- While on the subject of Government finance, we would point out that a significant diversification and broadening of the ACT's economic base via a large food production industry would enhance the Government's capacity to raise revenue and reduce its dependence on land sales for this purpose.
- **Labour.** People in traditional agriculture, horticulture, and associated service industries in rural/regional Australia, will be looking for new jobs as broadacre and irrigation operations are scaled down.
- A new potential source of labour in Canberra is **humanitarian entrant refugees**. Many of these folk, the adults, men and women in their forties plus, are originally from rural areas and experienced in growing food. They are industrious, intelligent and adaptable. Many have managerial and entrepreneurial potential. They are good money managers and soon accumulate capital to invest. For these people, probably the fastest track to economic independence and integration into Australian society is via participation in intensive horticulture. Also for these folk who have been traumatized and displaced from the homes and villages for up to 20 years, owning a piece of land or a business is a "therapy" in returning to normal life. These observations about the potential of refugees is borne out by Fusion Australia's experience over several years with Karen and Mon refugees from Burma in Fusion's intensive horticulture and aquaponics at Lions Youthhaven in Kambah.
- In the current discussion about Australia's population policy, most people agree that humanitarian entrant refugee numbers should be increased, not reduced. In addition, however, eventually and inevitably, when climate change refugees start arriving in Australia, an expanding intensive food production industry would provide them with jobs and supply the food that they and other Australians will be needing.
- Another source of workers in the new industry, could be young people who have been disengaging from employment . Fusion, which has experience with such people and programs which attract them to get back on the rails and into satisfying vocations in horticulture.
- **Location of Intensive Horticulture around the perimeter of Canberra.**
- **Several important outcomes of a food production industry in Canberra are related to the location of these operations. They should not be in outlying or remote areas in the ACT, but near or adjacent to residential areas with easy access to public transport :**
- intensive food production is labour intensive and also offers part-time employment opportunities for mothers, students etc
- ease of access for customers at on-site retail shops, and therefore
- lower prices by cutting out the middlemen and
- increasing the market share for local producers as compared with Woolworths and Coles enterprises ....
- which keeps more income from wages and profits within our city rather than their going to big producers and retailers interstate and overseas.

- **Essentially, as the need increases for Australia and the ACT to reduce “food miles”, carbon emissions and our environmental footprint, the transport and location factors will be given a higher priority in planning urban and near-urban areas. “Location, location, location” will be more important than ever.....which brings us to the need for appropriate planning.**

#### **PLANNING TO ENHANCE FOOD SECURITY IN THE ACT**

- The fact that Canberra is currently growing so little food is not a reason for ignoring our potential to grow a lot of food.
- The quality of life in Canberra today owes much to the wisdom and farsightedness of the first planners of the city relative to the longer term needs as they saw them at that time. The challenge for today’s planners is to show a similar farsightedness to enhance our food security.
- **This will require political will and action by the ACT Government to encourage and facilitate the growth of an intensive food production sector by measures such as zoning and rezoning land for food production and to prioritise the use of water.**
- Food security cannot be left to the outworking of market forces as can be seen in the West Sydney Basin over the last decade. In 2000, produce from the Basin supplied 30% of Sydney’s food needs. By 2010 the percentage has dropped to 16%, as half of this highly productive land was bought by housing developers. The other half of the 2000 production is under threat as the population of Sydney grows and the farmers run down their infrastructure preparatory to selling their farms to the developers. **This short-sighted and irresponsible failure to ensure food production in the face of the forecast decline in the Murrumbidgee Irrigation Area and other parts of NSW and Australia should be a warning to other Governments and planning authorities.**
- In August 2010, the Federal Minister for Agriculture and Sustainable Population, Tony Burke, told the National Press Club that Australia will need to stop building suburbs on top of arable land but he said that he couldn’t offer a quick fix on the issue (The Land 12 August 2010). But as the ACT Government owns all land in the ACT, it should be easier for it to do wise land use planning than administrations where land developers and other vested interest exert a powerful influence.
- On a more positive note, in Sydney in 2009, the Biennial Conference of the Hydroponic and Greenhouse industry was told of a proposal for a 200 hectare “greenhouse precinct” west of Sydney which could produce \$120 million worth of tomatoes, employ 1600 people and contribute up to \$80 million to the local economy. (The Land 6 August 2009).
- **Both the scale of the climate change challenge to food security and the scale of the measures Fusion believes are essential to meet that challenge make it imperative that the ACT Government move expeditiously to get action underway.**

#### **IS IT TOO EARLY TO PLAN NOW FOR CLIMATE CHANGE?**

- Isn’t planning now to mitigate food shortage in the ACT a bit premature ? What if the problems don’t arise for another 30 years ? Some people will ask those questions. But while the timing of the onset of climate change and food shortages is unpredictable, the scientists are warning that the most recent data indicate a speeding up of the temperature rises and the melting of ice in high altitude and polar zones. Already two extreme events - the August 2010 flooding affecting 20 million Pakistanis and the loss of one third of Russia’s grain crop - are having catastrophic impacts. In 2008 the Australian rice crop fell to 18,000 tonnes, ... a 98 % fall from the one million tonnes of 2006. So just imagine the impact of a similar drop in the wheat and other cereal crops in the Murray Darling Basin. Planning and preparation NOW is vital.

- The other part of the answer to the above questions is that even to build the relatively unsophisticated constructions and equipment that are required for large scale, intensive food production and to get it to top production, will take up to ten years. These things can't happen overnight even after all the planning, costing, and raising of capital is complete.
- BUT .....what if we do establish a food production industry in the ACT and it does prove to be premature, what then? No worries! The outcomes would be that Canberra had built an industry which diversifies our economy, sets up hundreds of new businesses, employs thousands of people, keeps food prices lower than they would otherwise be, provides some insulation against food shortages, reduces the power of the two retailing giants, and keeps wages and profits in our own city. Whether disaster comes soon, later, much later or not at all, we can't lose!
- **One billion people around the world in 2010 already do not have enough food to eat. The expansion of food production in every country should be a priority on moral and altruistic grounds, especially in Australia where with wisdom and foresight we could and should be trying harder to provide food for those who will otherwise starve. We must act now on food security both in our own self interest and for the sake of those less fortunate than ourselves.**
- A final word from Professor Julian Cribb: *"As to Australia's own role in all this I see us as the world leader in doubling water use efficiency. Our drought and water scarcity isn't a crisis – it is a golden opportunity for us to be the best in the world at turning water into food. I see all that knowledge, skill and technology earning us billions of dollars in knowledge exports. America might have Microsoft – but you can't eat software."*

*"...America might have Microsoft but you can't eat software."*

- Prof Julian Cribb

## RECOMMENDATIONS

- (1) Fusion recommends strongly that the ACT Government establishes at an early date the ACT FOOD SECURITY TASK FORCE comprising experts to assess the ACT's current and future food supply situation, investigate the potential of the food production industries referred to above and draw up a strategy and plan to ensure our food security as far as this is possible.
- (2) That the Government encourages all sectors of the community, all stakeholders and interested groups and individuals to discuss and debate the issues around food security for Canberra and to make submissions to the Task Force.
- (3) The Task Force should produce a draft report in six months, for public examination, with a final report in nine months.
- (4) The final report would be the basis for an ACT Food Security Policy and a program to implement it.

## ABOUT FUSION

Fusion is a Christian youth and community organisation started in Hornsby, Sydney in 1960 as a creative response to at risk youth. Fusion is now an international movement in over 15 countries worldwide. With a vision to bring young people and their communities together with hope, Fusion has become skilled at building social capital and social cohesion. In Canberra it has direct contact with hundreds of school students and young people at risk via school breakfast clubs and chaplaincy work, monthly youth adventure daytrips and an annual pilgrimage to Uluru & Canberra. It runs festivals and pageants involving the wider community, and a monthly business people's breakfast. For 18 years up to 2009, it ran Fusion Horticulture

at Lions Youthhaven on Kambah pool, where disadvantaged (unemployed youth, disabled, mentally handicapped, refugees) were trained and mentored in growing vegetables as a therapy, in developing self esteem and self confidence, and to reduce food expenses. Our interest in food security has mainly grown out of that experience.

Fusion has also been invited to expand in other countries such as Nigeria, Ghana, South Africa, India, Nepal, Sri Lanka, Bhutan, Bangladesh, China, UK, Germany, Albania, Greece, Canada, Jamaica & Indonesia. Working to address the significant needs and issues that many of these nations are facing such as food security and social fragmentation has refined our community development practices.

Fusion Australia has around two hundred fulltime staff assisted by thousands of volunteers in centres around the world. While it began its work among youth, the importance of a healthy and caring community has led Fusion into media, education and training, social policy development and extensive community development work.

**Fusion believes that climate change presents huge challenges for people across the globe not only in relation to water, food and shelter but also in the maintenance of social order and cohesion. Unashamedly coming from a Judeo-Christian framework, we believe it is crucial to address these challenges as part of responding in love for all people, responsibly stewarding our earth, and practically living out the "Golden Rule" – love your neighbour as yourself.**

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## ATTACHMENT A

An extract from an article by Graeme Smith (CPA), co-principal of Hydroponic Designs Pty/Ltd and President, Australian Hydroponic and Greenhouse Association.

Published in "Practical Hydroponics & Greenhouses" May/June 2007 p 29

The figures shown in the table relate to a hydroponic operation. An aquaponic operation of the same size producing fish as well as vegetables would give higher production figures and higher financial returns, and use only 10% of the water required in the open field.

In response to a detailed article published in *Good Fruit & Vegetables* (January 2007) on growing field tomatoes in the Goulburn Valley, Victoria, for the fresh table market, the Australian Hydroponic & Greenhouse Association (AHGA) has made a direct comparison with tomato production in a modern glasshouse situated only a few kilometres away, therefore experiencing exactly the same climatic conditions.

The following actual production figures of both field and glasshouse are from the last growing season and are converted to a 1 hectare rate (10,000m<sup>2</sup>) so that direct comparisons can be made.

|                                              | FIELD       | GLASSHOUSE  | %      |
|----------------------------------------------|-------------|-------------|--------|
| <b>Increase / Decrease</b>                   |             |             |        |
| Size (ha. 1ha = 10,000m <sup>2</sup> )       | 1ha         | 1ha         | 0      |
| Plant density (ave/m <sup>2</sup> ) increase | 1.1         | 2.2         | 100%   |
| Total Plants increase                        | 11,000      | 22,000      | 100%   |
| Annual Production (kg) increase              | 69,231      | 565,000     | 845%   |
| % 1 <sup>st</sup> Grade increase             | 80%         | 95%         | 17%    |
| Effective Production                         |             |             |        |
| 1 <sup>st</sup> grade kg increase            | 58,346      | 555,750     | 944%   |
| Effective Production                         |             |             |        |
| (kg per m <sup>2</sup> ) increase            | 5.9         | 55.6        | 944%   |
| Effective Production                         |             |             |        |
| per Plant (kg) increase                      | 5.3         | 25.3        | 477%   |
| Water Use increase                           | 9M/L        | 14.6M/L     | 182%   |
| Conversion Rate increase                     |             |             |        |
| (grams fruit per litre water)                | 7.4         | 38.2        | 517%   |
| Market Returns (gross) increase              | \$82,085    | \$1,667,260 | 2,024% |
|                                              | (\$1.40/kg) | (\$3/kg)    |        |
| Crop Length (months) increase                | 7           | 11.5        | 164%   |
| Equivalent Field Production (Ha) increase    | 1           | 9.4         | 944%   |

As can be seen by these actual production figures, modern glasshouses using closed and controlled production systems are truly the modern face of horticulture and deliver far superior results in terms of quantity, quality, water use and market returns.

When reviewing the production figures, it appears on the surface that greenhouse production uses more water than field production, however it's worth noting greenhouse production occurs over 11 1/2 months compared to 7 months for field production. The conservative greenhouse production figures also include all water used, not just that put on crops [i.e. fogging, roof sprinklers, hand washing, staff facilities, etc.]. The important point is the conversion rate of water used to tomatoes produced, and it shows greenhouse production clearly in front (500%+).

The 500+% water efficiencies alone (grams fruit per litre of water) should encourage all tiers of government to invest in greenhouse R&D to better utilize our ever dwindling water resources for a vast range of greenhouse crops.

These figures clearly show why leading supermarket chains have signalled to industry their intention to increase greenhouse tomato sales from the current estimated 17% (of fresh table market), to 50% over the next 5 - 8 years. This is a tripling of one sector of the greenhouse industry alone!

Some photos of the Fusion Aquaponics System that was setup through funding from an ACT Environment Grant 07/08. This was taken down in late 2009 as Fusion moved off Lions YouthHaven.

