

Crawford Fund Submission on the Foreign Policy White Paper

Global food security is essential for international peace and security. It also serves Australia's national interests. A sharper focus on food insecurity, drawing on the work of Australian scientists in agricultural research and development, and the ability of our farmers in harsh and changing conditions to adapt and adopt new technologies and farming practices, would enrich a new foreign policy with a more uniquely Australian character.

One of the most important contributions Australia can make to global stability and sustainability at a time of immense and potentially very dangerous global change is to help to feed people and feed them well. Australians appreciate the good performance of our farmers and understand that their contribution through commodity exports to global food and fibre supplies is crucial to this objective. But the real contribution of our science throughout our own food production chain and to global productivity is also vital and perhaps less well appreciated.

As the Australian Government formulates a White Paper on foreign policy it will no doubt look to policy measures to address the multi-fold causes of poverty, national and regional conflict and political insecurity.

Amongst these, a sharper focus on how the experience and expertise of Australian researchers, farmers and food processors can be used to help the food insecure adapt and adopt new technologies and environmentally sustainable farming and processing practices would enrich a new foreign policy with a more uniquely Australian character.

The Australian Centre for International Agricultural (ACIAR) is a crucial facility to translate this policy into practice in agriculture.

Such an effort should also nurture the Australian agricultural industry and the research assets upon which our expertise rests. A new generation of scientists, farmers and food manufacturers is emerging, more digitally savvy and more internationally conscious. Furthermore, we need to specifically target women and girls, who are increasingly involved in farming and nutrition decision making. Initiatives, such as the New Colombo Plan, Australian Volunteers for International Development (especially in the agricultural sector) and public/private partnerships, are important in ensuring these key scientific resources and understanding are sustained - both to aid our own agricultural industry and Australia's contribution globally.

As we have demonstrated investment in international agricultural research also benefits Australia directly¹.

We cannot take global food security for granted

The 2007-2008 international food price crisis showed that we cannot take food security for granted. The global population grew steadily through the last 50 years as public health care, water supply and sanitation improved. Life expectancies increased. At the same time, agricultural land was appropriated for industrial and urban development. Water resources came under greater pressure from all users. By 2007-2008 world grain stocks were low, drought inhibited production in some

¹See, for example, *Doing Well By Doing Good: international agricultural research – how it benefits Australia as well as the developing countries. The Crawford Fund, December 2013.*

major cereal growing countries, biofuel production was in competition with food production, and large consumers like China sought grains on the international commodity markets. Prices began to rise, sparking food riots in some countries and poorly conceived export bans in others. It was, inevitably, the poor who suffered, with the World Bank estimating that 125 million people were thrown back across the poverty line.

The next food crisis might be just around the corner. A “perfect storm” (a phrase used by Sir John Beddington² former chief scientists of the UK) with even more severe impacts on food production, is brewing as climate change impacts combine with continually growing population, demands for more and better food, interruptions to free trade, and competition for land, water and other natural resources to create an even more serious food crisis. A summary of the 2012 Crawford Fund Parliamentary Conference³, where the question was explored by experts, suggests the world ‘probably has enough land, nutrients and water, and one might infer ingenuity, to meet this challenge. Yet a food secure world will only be possible if major distributional and natural resource degradation problems are addressed with efforts to close the gap between achievable and actual yields as well as increased investment in research to raise yield potential’.

What we know: poverty, food insecurity and peace and security

The inter-relationship between poverty and food insecurity on the one hand, and national and regional conflict, peace and security on the other, is complex.

Just as there is no magic bullet to ensure global food security, there is no single cause of, or simple resolution to conflict and political instability. However, recent history provides evidence of a strong correlation between food insecurity and the outbreak of conflict. Food insecurity has led to widespread malnutrition, increased poverty, and food riots. It has thus been a trigger to societal unrest and revolution.

For the purposes of this submission we have reviewed the recent literature on the drivers of conflict, especially in relation to North Africa and the Middle East where the Arab Spring uprisings that commenced in 2010 were viewed as a culmination of shortages of food and income, unemployment, poor governance, corruption and ageing dictatorships. Most studies reviewed, cited per capita income, inequality and poor governance as major determinants of conflict.

Results from our review, however, also identify food insecurity at the macro and household levels as the main cause of conflict in the region.

Syria: Poverty and unemployment provided a fertile breeding ground for discontent and its exploitation by extremist groups leading to civil war and mass emigration.

The most recent example is provided by Syria where three years of drought, the consequential shortage of food and the failure of government to respond adequately, led to mass migration to the cities.

Before the Syrian uprising that began in 2011, the greater so-called Fertile Crescent experienced the most severe drought in the instrumental record. For Syria, a country marked by poor governance and unsustainable agricultural and environmental policies, the drought had a catalytic

² <http://webarchive.nationalarchives.gov.uk/20121212135622/http://www.bis.gov.uk/assets/goscience/docs/p/perfect-storm-paper.pdf>

³ The Scramble for Natural Resources, Proceedings of the Crawford Fund 2012 Parliamentary Conference, The Crawford Fund, 2013

effect, contributing to political unrest. A scientific review⁴ showed ‘that the recent decrease in Syrian precipitation is a combination of natural variability and a long-term drying trend, and the unusual severity of the observed drought is here shown to be highly unlikely without this trend. Precipitation changes in Syria are linked to rising mean sea-level pressure in the Eastern Mediterranean, which also shows a long-term trend. There has been also a long-term warming trend in the Eastern Mediterranean, adding to the drawdown of soil moisture. No natural cause is apparent for these trends, whereas the observed drying and warming are consistent with model studies of the response to increases in greenhouse gases. Furthermore, model studies show an increasingly drier and hotter future mean climate for the Eastern Mediterranean. Analyses of observations and model simulations indicate that a drought of the severity and duration of the recent Syrian drought, which is implicated in the current conflict, has become more than twice as likely as a consequence of human interference in the climate system’.

Somalia and Sudan

Other studies provide comparable evidence from Somalia and Sudan.

One study⁵ found a growing body of evidence of a causal relationship between extreme weather events and civil conflict incidence at the global level and that this causality is also valid for droughts and local violent conflicts in Somalia, over a short time frame. It also found that drought affects conflict through livestock price changes, establishing livestock markets as the primary channel of transmission of drought into conflict in Somalia.

Another article⁶ that contributes to the emerging micro-level strand of the literature on the link between local variations in weather shocks and conflicts by focuses on a pixel-level analysis for North and South Sudan between 1997 and 2009. Temperature anomalies were found to strongly affect the risk of conflict, whereas the risk is expected to magnify in a range of 24–31% in the future under a median scenario. This analysis also shed light on the competition over natural resources, especially water as the main driver of such relationships in a region where pastoralism constitutes the dominant livelihood.

Ethiopia and other good news from Africa

By way of contrast, a recent drought in parts of Ethiopia was managed due to prompt Government action and higher crops yields – due in turn to the introduction of higher yielding varieties of cereal crops supported by ACIAR and the Consultative Group on International Agricultural Research.

The following recent “good news” comment from a Bill Gates blog in relation to sub-Saharan Africa is also pertinent:

Although 2016 was a tough year for many African economies, almost every trend on the continent has been moving in the right direction over the last decade. Per capita income, foreign investment, agricultural productivity, mobile banking, entrepreneurship, immunization rates, and school enrolment are all heading upwards. Poverty, armed conflicts, HIV, malaria, and child mortality are all on the decline—steeply so in many places.

4 Science – Food Security: The Challenge of Feeding 9 Billion People

⁵ Extreme weather and civil war: does drought fuel conflict in Somalia? Maystadt and Ecker, Amer. Journal of Agri. Economics

⁶ Local Warming and Violent Conflict in North and South Sudan. Maystadt, Calder and You, Journal of Economic Geography (2014) pp 1-23

Whilst most commentary is based on events in the Middle East and Northern Africa, there are, we believe, lessons from Africa that can inform policy development in the Indo-Pacific region and more specifically in the countries forming the Melanesian Arc⁷ to our north. Circumstances in the Melanesian Arc are different from those in Africa and the Middle East: shifting agriculture in PNG and elsewhere; different social and religious structures; no great tradition of migration amongst Melanesians; climate variability is more about extreme weather events, sea level rise, acidification and the eastward shift of fish stocks. Nevertheless, these factors combined with population increase (especially in PNG), declining soil fertility with shorter fallow periods, fading 'subsistence agriculture', absence of alternative industry and employment opportunities are worrying trends.

Rebuilding food systems in post-conflict and post disaster regions

Much of the foregoing is based on actions to avoid the seemingly inexorable deterioration from drought, food insecurity through to civil unrest and even civil war. Even with the best efforts of the global community, however, conflict and disaster will always be with us. Although Australia's immediate emergency responses to such events have become fine-tuned and more effective, they could be further improved by sustained support to rebuild food systems in effected countries and regions bridging first responses with follow up capacity building. Australia support for Cambodia and East Timor are excellent examples of such assistance⁸. In 2013, Cambodia exported 1.2 million tonnes of rice which accounted for 3% of total worldwide rice exports.

It is highly likely that food insecurity will be a major concern for the next three decades

Because of climate change, extreme weather events have become more frequent in recent decades and are predicted by Intergovernmental Panel on Climate Change⁹ to further increase throughout the 21st century. Such events will see more flooding and erosion of agricultural lands and increasing incidence of drought, as well as the physical stress placed on the poor as heatwaves become more frequent and longer. In an agricultural context, whilst floods and droughts have known significant impacts on food security, also of concern are factors associated with climate change, such as gradually increasing night temperatures, which can inhibit flowering of major cereals such as wheat. Similarly, increased population and urbanisation will put land and water resources and ecosystems on which agriculture, forestry and fisheries depend, under increasing pressure. Australia has built significant expertise in designing and implementing environmentally sustainable agricultural systems, and this expertise can be a basis for adoption and adaption of sustainable systems in neighbouring countries. Finally, we recognise that other factors such as male migration to the Middle East in many Asian countries and the key role of females in agriculture elsewhere mean that Australian support of agricultural systems and their natural resource base has to specifically and increasingly target females in many areas if positive impacts are to be achieved.

The Crawford Fund, therefore, argues that food insecurity is of critical concern over much of Africa, the Middle East and the Asia-Pacific region. If the situation deteriorates, it is highly probable that

⁷ A joint Crawford Fund AIIA workshop on the Melanesian Arc was held on 22 February. Its conclusions will be passed to DFAT as a supplementary submission. The seminar showed the benefit of cross fertilisation achieved by bringing together agricultural, biological, social and political scientists together with officials from DFAT and Defence. It also highlighted the priority of fisheries in the region.

⁸ Further evidence on the success of Australia's work in both countries is available.

⁹<https://www.ipcc.ch/>

societal unrest will promote opportunities for fanaticism, terrorism and old-fashioned banditry, including in the Indo-Pacific.

A well-targeted food security program as a cornerstone of foreign policy

The Australian Government has set promoting prosperity, reducing poverty and enhancing stability as the central tenet of Australian aid¹⁰. Our core policy proposition is that to deliver on these ambitions, as well as the sharpened focus on the Indo-Pacific region identified in the Government's announced reforms, Australian aid should have a sharper sectoral focus on food security.

Such a focus could constitute a cornerstone of a new Australian foreign policy.

Unfortunately, during the current century international overseas development assistance to agriculture has generally decreased and food productivity indices have accordingly dropped below levels needed to keep up with population growth in developing countries.¹¹ Australia could play a major role in helping to reverse these worrying trends by devoting an increasing proportion of its aid budget to food security - say to a level over time of \$500 million a year. Australia could assume a position in centre stage in the global fight against hunger, malnutrition and poverty thereby make a major contribution to peace and security. ACIAR is a vehicle with a strong track record. There is robust evidence of the beneficial impact of its investments in international agricultural research documented in its Impact Assessment Series¹² of reports.

The Government may also wish to expand the scope of ACIAR's mandate to include more explicitly human health and nutrition, environment, sustainability and climate change and education, training and engagement of women and girls in the developing world. There will be other intersectoral linkages such as with mining services (the Fund's 2010 Conference on mining and agriculture demonstrated close linkages between the two sectors especially in terms of mine rehabilitation and investment of mining revenues in agriculture and the market for food constituted by mining enterprises). In addition, engagement with the private sector – both in Australia and the developing world should be emphasized.

The policy and institutional question on this suggestion is whether to expand ACIAR's mandate or create new ACIAR-like bodies for other sectors. There is a risk with the former of a dilution of ACIAR's mandate unless it comes with substantially increased resources and/or a lack of serious attention to the new sectors. Such a step would, however, avoid administrative duplication and it would leverage on ACIAR's brokerage skills, the links between these sectors and rural development and on ACIAR's operational experience in the international environment. Creating new bodies might be less efficient, more expensive and set up boundary issues in areas like nutrition and one-health, climate change and rehabilitation of mined lands.

In either case, the strength of an institutional focus on research for development (that underpins development) compared to aid for development *per se* is crucial. Research for development requires a greater depth of technical expertise in science, longer institutional memory and more durable in-country relationships – especially involving the private sector - that are sustained well beyond the life of any aid funded project.

¹⁰ Commonwealth of Australia, DFAT, Australian aid: promoting prosperity, reducing poverty, enhancing stability, June 2014.

¹¹ See, for example, Fischer, Byerlee and Edmeades 2014. Crop Yields and global food security: will yield increase continue to feed the world? ACIAR Monograph No. 158, ACIAR Canberra.

¹² Impact Assessment Series, Australian Centre for International Agricultural Research, Canberra Australia

Doing Well by Doing Good

As we have shown (The 2013 Crawford Fund Task Force on international agricultural research – how it benefits Australia), as well as enhancing food security for the developing countries such investments can also directly benefit Australian agriculture and our regional and rural communities.

Biosecurity is an area of international agricultural research where the shared benefits of investment in R&D are most evident (The ACIAR Assessment Series (op. cit.) provides evidence of successful interventions to address potential invasive species such as the banana leaf hopper and emerging threats from the banana blood disease making its way across the Indonesian archipelago).

Managing the spread of significant plant pests and diseases is critical to food security and farmers' incomes nationally and at the global level. An efficient and effective plant biosecurity system is also a major enabler of regional and international trade in agricultural products. A recent report¹³ by the Biosecurity Cooperative Research Centre shows that increased collaboration between Australia and Indonesia around plant biosecurity will benefit both countries, leading to improved regional food security and expanding trade and market access for agricultural produce.

Nurturing our farming, policy development and scientific communities.

Substantial scientific strengths are housed in Australia's research and teaching institutions, amongst our farmers, and in the private sector all of which can be tapped more extensively by ACIAR given a substantial increase in its financial resources. Partnerships with the private sector are particularly important and ACIAR should be encouraged to extend its current efforts with the sector.

Arrangements with Australian research agencies, based on ACIAR's well established partnership approach, need to serve the mission and revenue objectives of both public and private sector players whilst retaining a focus on the development purposes of the aid program .

Significant expertise resides at the senior end of these communities where many people are positioned toward the end of their full time working careers but are still available and interested in volunteer assignments abroad. This can be drawn upon through DFAT's Australian Volunteers for International Development (AVID)¹⁴.

At the same time, we need to encourage younger people and early career researchers into modern agriculture with opportunities in its digital and international dimensions. Suitably restructured to give greater emphasis on agriculture and food security, Australian Volunteers for International Development (AVID) and the New Colombo Plan are tools available for Government and private sector intervention to these ends.

Much of Australia's expertise and potential rests with women and special measures could be taken to encourage women to participate more extensively in international agricultural research activities. *Australian Women in Agriculture Limited* has extensive experience in ensuring women influence the agriculture agenda and its Board comprises women familiar with Australian and international agriculture.

¹³ Opportunities and Benefits for Collaboration on Indonesian Plant Biosecurity: A Bilateral approach. Plant Biosecurity Cooperative Research Centre, 2016.

¹⁴ The Challenge of Agricultural Disease and Pest Management in Laos: A Case Study in Team Volunteering in Partnership with the Crawford Fund, Scope Global, Kent Town, Australia, 2016

Science diplomacy and Australia as a trusted science partner in the Indo-Pacific

Much of Australia's work in the region aims to build the scientific and technical capability of developing countries to tackle the long-term and complex issues constraining their agricultural productivity. Australia itself faces many of the same issues – it has a comparative advantage in agricultural science as climates in the region become more variable and extreme weather events become more intense and frequent. Accordingly, ACIAR invests more than \$10 million a year in training and capacity building on top of its research spending. The Crawford Fund is engaged with ACIAR, the Plant Biosecurity Cooperative Research Centre, and CABI in the Australia Africa Plant Biosecurity Partnership involving 14 countries in Eastern and Southern Africa. This project draws extensively on Australia's world-leading biosecurity policies, structures and practices. Through efforts such as these, Australia has become a trusted science partner in the region. As this trust grows and builds, it will support our economic and trade relationships.

Free trade in agriculture and agricultural services, foreign investment in Australian agriculture and Australia investment abroad

Policy options include considerations beyond our mandate and are no doubt being addressed in other contexts. For example, policies that encourage foreign investment in agriculture in Australia and Australian investment in agriculture abroad are relevant to the issues being identified in the invitation for submissions on the White Paper. Our ability to export food and agricultural services is limited by our productive capacity and available expertise. Similarly, private sector investment in potentially profitable agriculture enterprises abroad may benefit from government policy measures and practices that encourage such investment.

There may be scope for a refreshed and retargeted effort, in harness with like-minded countries, to recharge the push for free trade in agricultural goods and services. Security of food supplies from Australia - in live cattle exports for example - are of critical importance to our bilateral relationships with a growing number of countries in our region.

We assume that others will address the free trade and security of supply aspects of global food security. The Minister may wish nevertheless to discuss the interaction between trade policy issues and food insecurity with Australian and international experts. The International Food Policy Research Institute would be a good starting point.

Conclusion

This submission has been subject to widespread consultation within the Crawford Fund network of State and Territory Committees and has been endorsed by its high-level Board of Directors. We believe its recommendations enjoy bipartisan and community support.

By enhancing food security for the developing countries through investments in international agricultural research and development Australia can promote prosperity, reduce poverty and enhance stability. Such investments can also directly benefit Australian agriculture and our regional and rural communities

Bibliography

A selection of published papers has been drawn upon in the preparation of this note. For convenience abstracts of the papers are included in an attachment to this draft.

Crawford Fund Submission on The Foreign Policy White Paper: Abstracts of articles drawn upon.

1. Doing Well by Doing Good: International agricultural research – how it benefits Australia as well as the developing countries. The Crawford Fund, December 2013

International agricultural research is aid that works. It also delivers benefits to Australian farmers and contributes to Australian knowledge and research capacity. Skilled leadership and design is needed to pursue win-win goals and new benefit. With some refinement, more could be achieved. ACIAR should remain as a separate entity with its budget maintained at least at the current level and increased as is contribution to agricultural productivity in Australia as well as developing countries is confirmed.

2. The Perfect Storm - PNAS – Global Food Demand and The Sustainable Intensification of Agriculture

<http://webarchive.nationalarchives.gov.uk/20121212135622/http://www.bis.gov.uk/assets/goscience/docs/p/perfect-storm-paper.pdf>

Global food demand is increasing rapidly, as are the environmental impacts of agricultural expansion. Here, we project global demand for crop production in 2050 and evaluate the environmental impacts of alternative ways that this demand might be met. We find that per capita demand for crops, when measured as caloric or protein content of all crops combined, has been a similarly increasing function of per capita real income since 1960. This relationship forecasts a 100–110% increase in global crop demand from 2005 to 2050. Quantitative assessments show that the environmental impacts of meeting this demand depend on how global agriculture expands. If current trends of greater agricultural intensification in richer nations and greater land clearing in poorer nations were to continue, ~1 billion ha of land would be cleared globally by 2050, with CO₂-C equivalent greenhouse gas emissions reaching ~3 Gt y⁻¹ and N use ~250 Mt y⁻¹ by then. In contrast, if 2050 crop demand was met by moderate intensification focused on existing croplands of under-yielding nations, adaptation and transfer of high-yielding technologies to these croplands, and global technological improvements, our analyses forecast land clearing of only ~0.2 billion ha, greenhouse gas emissions of ~1 Gt y⁻¹, and global N use of ~225 Mt y⁻¹. Efficient management practices could substantially lower nitrogen use. Attainment of high yields on existing croplands of under-yielding nations is of great importance if global crop demand is to be met with minimal environmental impacts.

3. The Scramble for Natural Resources: More food less land.

Proceedings of the Crawford Fund 2012 Annual Parliamentary Conference. The Crawford Fund 2012

The Conference addressed a question of fundamental importance to Australia and the international community: that is how to feed, adequately, an extra 2 or 3 billion people within a few decades without irretrievably damaging the planet. The consensus response was that the world probably has enough land, nutrients and water and one might infer ingenuity, in aggregate, to meet the challenge. Yet a food secure world will only be possible if major distributional and degradation problems are addressed with efforts to

close the gap between achievable and actual yields, as well as increased investment in research to raise the yield potential.

4. Science – Food Security: The Challenge of Feeding 9 Billion People

Continuing population and consumption growth will mean that the global demand for food will increase for at least another 40 years. Growing competition for land, water, and energy, in addition to the overexploitation of fisheries, will affect our ability to produce food, as will the urgent requirement to reduce the impact of the food system on the environment. The effects of climate change are a further threat. But the world can produce more food and can ensure that it is used more efficiently and equitably. A multifaceted and linked global strategy is needed to ensure sustainable and equitable food security, different components of which are explored here.

5. Extreme Weather and Civil War: Does Drought Fuel Conflict in Somalia Through Livestock Price Shocks?

Maystadt and Ecker, *American Journal of Agricultural Economics*, March 25, 2014

A growing body of evidence shows a causal relationship between extreme weather events and civil conflict incidence at the global level. We find that this causality is also valid for droughts and local violent conflicts in a within-country setting over a short time frame in the case of Somalia. We estimate that a one standard deviation increase in drought intensity and length raises the likelihood of conflict by 62%. We also find that drought affects conflict through livestock price changes, establishing livestock markets as the primary channel of transmission in Somalia.

6. Journal of Economic Geography – Local Warming and Violent Conflict in North and South Sudan

Maystadt, Calder and You, *Journal of Economic Geography*, September 8, 2014

Our article contributes to the emerging micro-level strand of the literature on the link between local variations in weather shocks and conflicts by focusing on a pixel-level analysis for North and South Sudan between 1997 and 2009. Temperature anomalies are found to strongly affect the risk of conflict, whereas the risk is expected to magnify in a range of 24–31% in the future under a median scenario. Our analysis also sheds light on the competition over natural resources, in particular water, as the main driver of such relationship in a region where pastoralism constitutes the dominant livelihood.

7. A joint Crawford Fund AIIA Workshop on the Melanesian Arc Proceedings not yet available.

8. Intergovernmental Panel on Climate Change 2013 – Fifth Assessment Report – Summary for Policy Makers, The Physical Science Basis.

Warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, sea level has risen, and the concentrations of greenhouse gases have increased.

9. <https://www.ipcc.ch/>

10. Australian Aid: promoting prosperity, reducing poverty, enhancing stability. Commonwealth of Australia, DFAT, June 2014

The Australian Government's new development policy, *Australian aid: promoting prosperity, reducing poverty, enhancing stability*, and new performance framework, *Making Performance Count: enhancing the accountability and effectiveness of Australian aid*, introduce key shifts in our aid program. These reforms will build an aid program that is effective in promoting economic growth and reducing poverty, and that projects and protects Australia's broader interests in the Indo-Pacific region. They will ensure a stronger focus on performance, results and value-for-money.

11. Fischer Byerlee and Edmeades 2014. Crop Yields and global food security: will yield increases continue to feed the world?

Notwithstanding considerable uncertainty, this book has collected evidence that supports the notion that FY progress of 1.1 per cent per annum (relative to 2010 yield) is the minimum needed to feed the world in 2050 at real process close to those in 2010 and not too far above the 200-2006 record low process.

12. Impact Assessment Series, ACIAR

<http://aciarc.gov.au/publicationbycategory-all#Impact-Assessment-Series>

13. CRC Plant Biosecurity – Opportunities and Benefits for Collaboration on Indonesian Plant Biosecurity: A Bilateral Approach

Increased collaboration between Indonesia and Australia around plant biosecurity will benefit both countries, leading to improved regional food security and expanding trade and market access for agricultural produce.

Indonesia's goal of food security for its 13,000 inhabited islands, and Australia's need to protect its northern borders from pest and disease incursion, can both be supported by the two countries working more closely on plant biosecurity.

There is a number of collaboration opportunities in this area, including measures for early detection and response to pest and disease threats, food storage methods, increased research capacity, policy integration, education and training strategies, digital tools and improved partnerships across all levels of government.

One of the major opportunities is the implementation of sound plant biosecurity processes that will drive agricultural productivity and therefore food security in Indonesia. A dual strategy of increasing production and reducing loss provides the best chance for Indonesia to achieve its 2015 food security goals. Such a strategy provides a clear role for bilateral partnership, drawing on Australia's knowledge and practice in plant biosecurity management.

Indonesia and Australia's goals around biosecurity and food security are compatible and a strong working relationship will not only improve food security in the region, it will extend trade and market access opportunities. Opening markets is only possible if complex market conditions are met, and both countries are dependent on strong and effective plant biosecurity measures. Indonesia's expressed wish to join the Trans-Pacific Partnership (TPP) requires the implementation of such a plant biosecurity strategy.

Indonesian officials at central government and provincial levels, as well as academics at all levels, have expressed a wish to enter into a bilateral relationship with Australia to enhance

knowledge and strategies in the face of a huge and complex mega-biodiverse country with a pressing need to achieve food security and food sovereignty.

A bilateral relationship would help both countries achieve better plant biosecurity measures while improving trade and market access. Australia has significant expertise and strong international linkages to contribute to a collaborative network with Indonesia including: knowledge and networks internationally, risk assessment and development of import conditions, international standard setting, offshore audits and verification, border activities, post-entry quarantine, domestic quarantine, pest management, food storage methods, surveillance, diagnostics, emergency response, export inspection and certification.

Engaging two of the world's mega-biodiverse countries in joint research and development, as part of a collaborative bilateral agenda, will result in enhanced biosecurity measures and significantly impact strategy, policy and practice in a cycle of change from grassroots to green papers.

The success of any future collaborative activities in the Indonesian context depends on a strong in-country presence on Australia's part.

14. Scope Global - The Challenge of Agricultural Disease and Pest Management in Laos: A Case Study in Team Volunteering in Partnership with the Crawford Fund

Agriculture is a vital industry for both smallholders and business owners in Laos. Agricultural productivity, and the volume of crop exports and imports, has been increasing rapidly over the past decade. Horticulture (fruit and vegetable production) is a major contributor to the agricultural economy (the third largest after rice and maize) and has the potential to significantly improve the lives of smallholder farmers and their communities. However, diseases and pests routinely cause 20-50 per cent losses of many crops.¹ Ensuring the quality of produce and controlling agricultural pests and diseases is an obstacle for farmers and a challenge to food security.

Other Reading

Conflict and Food Insecurity: How Do We Break the Links?

Food and nutrition insecurity are becoming increasingly concentrated in conflict-affected countries, affecting millions of people. Policies and interventions that build resilience to these shocks have the power to not only limit the breadth and depth of conflict and violence around the world, but also strengthen national-level governance systems and institutions.

15.IFPRI – How to Build Resilience to Conflict: The Role of Food Security

To understand the relationship between conflict and food security, this report builds a new conceptual framework of food security and applies it to four case studies on Egypt, Somalia, Sudan, and Yemen. It argues that food security-related policies and programs build resilience to conflict insofar as they are expected not only to help countries and people cope with and recover from conflict but also to contribute to preventing conflicts and support economic development more broadly: by helping countries and people become even better off.

16.Crop Trust – A Look Back On 2016

2016, the planet's hottest year on record, brought unprecedented conditions and challenges to many regions of the globe.

Below the equator in Southern Africa, the year started with a dry summer that pushed a gathering drought to a crisis point, with the lowest rainfall totals that the region had seen in 35 years.

Globally, challenges continued with carbon dioxide levels in the air at the highest in 650,000 years. These challenges, coupled with population growth, will continue to place unprecedented pressures on our ability to grow the food we require. Adapting agriculture to new conditions is therefore essential and couldn't be more urgent.

17.CGIAR – Outcome Stories

<https://waterandfood.org/outcome-stories/>

<http://www.iwmi.cgiar.org/research/impact-assessment/outcome-stories/>

<http://drylandsystems.cgiar.org/outcome-stories>

<https://ccafs.cgiar.org/research/results>

18.Julie Bishop – Economic Globalisation and Elites Under Siege

http://foreignminister.gov.au/articles/Pages/2017/jb_ar_170109.aspx

19.The Conversation – Understanding the Islamic State

Since announcing its arrival as a global force in June 2014 with the declaration of a caliphate on territory captured in Iraq and Syria, the jihadist group Islamic State has shocked the world with its brutality. Its seemingly sudden prominence has led to much speculation about the group's origins: how do we account for forces and events that paved the way for the emergence of IS? Do the answers lie in the 20th century, which saw the fall of the Ottoman Empire, the creation of new nations in its wake and their struggle for independence as well as articulation of national identities? Is it hidden in the debris of the Gulf and the Iraq Wars? Or do we have to look deeper in history – to the fundamental tenets of Islam, the Crusades or the so-called Assassins of the 11th to 13th centuries? Which of these – if any – can be said to have created the

conditions necessary for the rise of IS? In the article kicking off our series on the genesis of the group, James Gelvin cautions against easy answers. Just because one event followed another, he says, doesn't mean it was also caused by it. Far better, we decided, to look at the interplay of historical and social forces, as well as recognising that outfits such as IS often cherry-pick ideas to justify their beliefs and behaviours. So, our series on understanding IS attempts – in a dispassionate way – to catalogue some of the many forces and events that can arguably have played a part in creating the conditions necessary for these jihadists to emerge. We've spread the net wide but make no claim to being comprehensive or having the final word on the historical origins of IS. After Gelvin's broad introduction to the group and warnings about the misuse of history, we turn to Islam and its theology, then to the Assassins of medieval history and the Crusades, before leaping into the 20th century. The series concludes with a look at more proximate events – the role of the recent wars in the region and their aftermath. It seems that to understand Islamic State, we need to look not just at the Middle East itself but also at the complicated role of the West in it.

20. Our World, UN – Food Insecurity and The Conflict Trap

The ongoing famine in war-prone Somalia has led to much speculation about the link between violent conflict and food insecurity. Some commentators have also connected this year's political revolutions in Egypt and Tunisia to record high food prices.

A recent paper released by the United Nations World Food Programme (WFP) Policy Planning and Strategy Division analyses the link between food insecurity and conflict, both political (e.g., revolutions, civil unrest) and violent (e.g., civil or interstate war). The report also identifies ways, which are discussed below, in which national governments and the international community can provide food assistance that restores peace and builds social capital.

In *Food Insecurity and Violent Conflict: Causes, Consequences and Addressing the Challenges*, authors Henk-Jan Brinkman and Cullen S. Hendrix illustrate clearly that food insecurity is a "threat and multiplier for violent conflict". Based on their fairly broad review of the research, in which more than 100 sources were referenced, "food insecurity, especially when caused by higher food prices, heightens the risk of democratic breakdown, civil conflict, protest, rioting, and communal conflict."

21. World Food Programme – Food Insecurity and Violent Conflict: Causes, Consequences, And Addressing the Challenges

This paper provides an overview of the link between food insecurity and violent conflict, addressing both traditional and emerging threats to security and political stability. It discusses the effects of food insecurity on several types of conflict, and the political, social, and demographic factors that may exacerbate these effects. It then discusses the interventions that can break the link between food security and conflict, focusing on mechanisms that can shield consumers and producers from food price shocks. Finally, it discusses ways in which the international community can assist in breaking this link and build peace.

22. Ellen Messer, United Nations University – Conflict as A Cause of Hunger

Throughout human history, conflict has been a source of hunger vulnerability. This chapter describes the range of ways in which "food wars" contribute to hunger, and the political and humanitarian efforts to limit food wars and why they succeed or fail. A "food war" is defined here as "the deliberate use of hunger as a weapon or hunger suffered as a consequence of armed conflict" (Messer 1990). Included in the concept are cases in which repressive measures and government policy meld to deny or restrict access to productive resources and income, as in the case of forced relocation in several African and Asian civil wars, and the discriminatory practices

associated with legal frameworks or social practices of discrimination, such as apartheid in South Africa (Heggenhough 1995).

23.Chicago Council on Global Affairs – Global Food for Thought: Expert Commentary and Analysis on Global Agriculture and Food

The desperation that arises from the inability to feed one's family leaves an individual with few choices, many of them bad. The options include migrating to cities in search of work, or even abroad, but also engaging in questionable or even illegal activity, such as black market transactions, theft, or prostitution. At the far end of the spectrum, some end up resorting to armed violence, either full-time enlistment in a militia or insurgency, or cooperating with such groups to earn an occasional payment. During the Shia uprising in Iraq after the Second Gulf War, Newsweek reported that village residents were paid between \$40-\$100 to plant IED's on roads, intended to maim or kill American soldiers or Marines. In 2002, right before that war, the average monthly income for an Iraqi was less than \$65 a month.

24.Ellen Messer & Marc J Cohen – Development in Practice: Understanding and Responding to The Links Between Conflict and Hunger

Rising food prices in the late 2000s sparked protests, sometimes violent, around the globe. These public expressions of outrage were only the tip of the iceberg. Many countries have a legacy of food wars. In sub-Saharan Africa, at least 14 countries faced severe food insecurity as a result of conflict, civil strife, forced displacement, or damage from past wars. Armed violence leads to ongoing cycles of food loss which have an impact on food availability, access, and nutrition. In turn, food insecurity can contribute to conflict, although the exact sequence tends to involve complex factors, including environmental scarcities and identity-based competition for access to and control over what are perceived to be limited resources. Policy attention is urgently needed to address these dynamics. Efforts to meet the immediate needs of vulnerable populations, to raise agricultural production, to build resilient food systems that contribute to global food and nutrition security, and to protect low-income people with safety nets must not lose sight of conflict legacies, especially in Africa. Programme-implementation strategies must proceed in a manner that will dampen, not heighten, conflict potential.

25.United Nations University – Wider Working Paper: Growth and Poverty Reduction in Tanzania

After many years of relatively slow growth, Tanzania's national accounts data report accelerated aggregate growth since around 2000. Our analysis shows that there has been somewhat slower growth in private consumption and in sectors such as agriculture in which most of the poor work and live. The household survey data documents a limited reduction in consumption poverty over the period, and what poverty reduction there has been has mostly occurred in Dar es Salaam. Indicators of non-monetary poverty have gradually improved over the past 20 years but significant differences across the country remain.

26.Reuters – G20 Farm Ministers Seek to Protect Precious Water Supplies

Greater global efforts should be taken to safeguard precious world water supplies to secure food production, the agriculture ministers of the group of 20 leading economies (G20) said on Sunday.

27.IFPRI- Shenggen Fan – Scaling Up Innovations in Water Use for Food Security

Achieving SDG 2 on ending hunger and malnutrition will require efficient and sustainable use of natural resources, especially water. More efficient water-use in agriculture is needed as agriculture is the world's main user of water—irrigation accounts for 70 percent of global freshwater withdrawals and 85 percent of global water consumption. Moreover, current water use in agriculture is unsustainable: an estimated 7 percent of cereals are irrigated with groundwater resources that are not being replenished. Agricultural water pollution is rapidly growing and under business as usual, almost half of all cereals will be grown in areas of great water stress by 2050 putting food security and rural livelihoods at risk.

28.Crawford Fund Proceedings: – Food, Water and War Security in a World of Conflict

http://aciar.gov.au/files/node/2255/mn73_food_water_and_war_security_in_a_world_of_c_12704.pdf

Many accept the concept of the beneficial returns to donor countries from investing in development assistance, few would consider that it might also contribute to peace in the developing world. Can we add 'peace' to the more tangible returns to development assistance, such as growth in trade, goodwill between nations, greater cultural, educational and scientific cooperation, and technological gains? The Crawford Fund believes that agriculture, food, and access to natural resources like water, play key roles in development for poor nations and in avoiding conflict. In the complicated matrix of the causes of conflict in developing countries we encouraged participants at the conference to think about security outside the military dimension. Many think tanks around the world, including the world-renowned Peace Research Institute in Oslo, believe that the post-cold-war-era calls for new policies that will help avert conflict in the 21st century. These policies need to address a different paradigm for violence and conflict—that of supplying basic human needs. The keynote speaker at the conference, Admiral Chris Barrie AO RAN, signalled a new shift in our understanding of what security is. Fighting for food, said Admiral Barrie, is a stronger driver than allegiances and politics. He believes that Australia must be prepared to do more to maintain peace and security in our region, and he advocated a multidisciplinary approach—a 'whole-of-nation'—approach as he termed it, to peacekeeping and conflict resolution in our region of the world.