

Strategic Analysis Paper

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Australian Aid: Investing in Agricultural Research and Development

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Key Points

- Current agricultural practices are failing to nutritiously feed the global population. Research, development and extension (RD&E) in agriculture is essential to ensure the food security of future generations.
- Australia currently contributes to the food security of approximately 500 million people through agricultural research and development programs developed and implemented by the Australian Centre for International Agricultural Research (ACIAR).
- Returns on public and private investment in international rural development are consistently high.
- Australia's engagement in international agricultural development is part of a larger effort in economic diplomacy.
- The Australian government could do more to increase private investment in international rural research, to ensure that agricultural partnerships and programs receive appropriate funding in the long term.

Summary

The global agricultural research and development market provides opportunities for Australia to assist developing nations whilst boosting domestic food security. Over the next 50 years population growth, climate change and environmental degradation will jeopardise international food security. Agriculture is at the heart of the Australian economy, and is an

important bargaining chip in the development of bilateral and regional economic relationships. It is imperative that Australia remains at the cutting edge of agricultural research, so as to maintain regional leverage and to safeguard our domestic food security.

Investment in international agricultural R&D can be lucrative for both public and private investors. Recent trends show a high return on each dollar spent, and wide-reaching spill-over benefits resulting from rural investment.

Currently, Australia produces enough food to feed 60 million people, and contributes indirectly to the food security of 500 million people, through the sharing of knowledge and technology. While variable environmental conditions and resource limitations confine domestic food production growth prospects, there is enormous scope for Australia to assist with international agricultural development.

Analysis

The world faces a fundamental and daunting challenge in nutritiously feeding a rapidly growing population. As a result, investment in agricultural RD&E needs to be high on the international development agenda. At the Crawford Fund's annual conference in Canberra this year, World Bank Group Vice President and special envoy for climate change, Rachel Kyte emphasised the ["uncertain times"](#) facing policymakers whose task it is to ensure the planet remains fed.

By 2050, 9 billion people are expected to inhabit the planet. The UN Food and Agriculture Organization estimates that [US\\$83 billion](#) in investment is required per year to meet global food demand. Current agricultural practices are failing to meet requirements; one in eight people suffer from chronic hunger and over 1 billion people are undernourished. Global agriculture also contributes to 30 per cent of greenhouse gas emissions. Furthermore, the global urban population is rapidly increasing, reducing the agricultural workforce while increasing food demand. Ms Kyte addressed the need for a new global agricultural paradigm with equal focus on nutrition, climate change and sustainability. As the world's population becomes increasingly urbanised, a holistic and progressive approach to agriculture will be crucial for food security.

Agricultural RD&E: A Global Need

Public investment in agricultural RD&E is aid that works. The development of agricultural technology and its implementation in developing countries can build the capacities of vulnerable communities to become food secure. Hunger and malnutrition prevent people from escaping poverty by diminishing physical capability and education, as well as creating a burden on health systems. Addressing agricultural research at a grass roots level boosts the long term productivity of local industries and assists communities to self-develop.

The global agricultural sector employs the largest proportion of people worldwide, many of who remain smallholder farmers. Achieving productivity growth among these farmers leads

to food surpluses and additional income that can be spent on healthcare, education and other necessities. By injecting capital into agricultural RD&E, investors can assist in sustainably alleviating poverty.

Returns on public investment in agricultural research are consistently high. Based on 700 published studies, the [World Bank's Development Report 2008](#) found average returns on agricultural RD&E in the developing world are 43 per cent. According to the International Fund for Agricultural Development, achieving productivity growth in agriculture can be up to [four times more effective](#) in reducing poverty than growth generated by other sectors. The sharing of knowledge and technology creates spill-over benefits that magnify the impact of investment. Agricultural RD&E investment, therefore, should remain high on Australia's agenda.

Australia's Strategic Framework

The Australian government has recognised the strategic importance of international agricultural investment. Extending agricultural science internationally is an investment in global wealth and can be a catalyst for broader economic growth. This has the potential to strengthen Australia's long-term food security through the creation of strong international relationships.

Australia has great capacity in agricultural research to contribute internationally. Currently, the country produces a food surplus sufficient to maintain the diets of 40 million people. Australia contributes further through its investment relationships in agricultural science, assisting to provide food security for approximately 500 million people.

Geographical isolation and exposure to climatic variability and extreme climate events such as droughts, fires and floods has forced Australia to remain at the cutting edge of international agricultural technology. Australia's distance from export markets has meant it has also had to improve the efficiency of supply chains in order to be competitive internationally. Australia shares a variety of agro-ecological conditions with parts of the developing world, and already maintains successful relationships with developing country research institutes and universities.

Despite the benefits of RD&E in agriculture, Australia's overall share of development assistance in agriculture declined over the past two decades. This has followed a global trend: while investments by all Organisation for Economic Co-operation and Development (OECD) countries in other important areas (such as health, education and governance) increased, rural [sector investments](#) fell from about 13% of total OECD official development assistance in the mid-1970s -at the height of the green revolution - to about 4% by 2008.

Agriculture has recently regained attention in the Australian international development agenda. In 2011, the Australian Centre for International Agricultural Research (ACIAR) released a strategic framework plan, which provides guidance on Australia's future role in global food security. The Framework adopts five key focus areas for agricultural investment:

institutional strengthening and capacity building within the Australian research sector; institutional innovation for effective delivery of research results; the development of partnerships in specific geographical areas; increasing Australia's engagement with global research programs including the new CGIAR Research programs; and communications and public awareness.

Economic Diplomacy

ACIAR's work is part of a larger national effort in economic diplomacy. Government Agencies such as the Department of Foreign Affairs and Trade, Austrade, ACIAR, EFIC and Tourism Australia each play a part. Economic diplomacy differs from traditional diplomacy as a vehicle for regional and global prosperity, using economic relationships as a foundation for international security.

Julie Bishop's "[New Aid Paradigm](#)" emphasises the role of economic aid in regional transformation. In line with the WTO's "Aid for Trade" policy, Australian aid is to focus on fostering trade capacity and infrastructure in developing nations, as a vehicle for sustainable growth.

Ms Bishop has identified agriculture, fisheries and forestry as key sectors that Australia holds particular expertise. The current government has pledged to use ACIAR's research capabilities to better effect in addressing regional development. The private sector will also play a key role by providing leverage for public programs. Assisting with agricultural and sustainability management would further Australia's regional leadership credentials, and keep Australia at the forefront of agricultural research.

ACIAR programs in Indonesia, South Asia and the Pacific boost economic partnerships in the Asia Pacific region. Bilateral trade links support Australian agricultural exports while also increasing food production and quality in the developing world. Countries and regions targeted by ACIAR also tend to share similar challenges to Australia such as drought and water management, so our international investment creates spill off benefits for Australian farmers.

ACIAR's focus on developing partnerships in specific geographical areas, such as the Indian Ocean Rim, is of strategic importance to Australia. Two thirds of Australia's development partners in the Indian Ocean Asia-Pacific region are middle-income countries and hold a large proportion of the world's poor. In doing so, ACIAR has refocused its investment away from the Middle East and [towards Asia](#). Investment in agricultural development in Asia has the potential to improve regional security, create significant long-term benefits from trade partnerships and deliver technologies for the future farmers of Australia. These projects represent a broader effort to improve Australia's position as a regional leader while enhancing our neighbours' economic peace and prosperity.

ACIAR and Non-Governmental Organisations

As Australia's primary statutory authority in international rural development, ACIAR also contributes to agricultural RD&E by providing NGOs with advice about agricultural activities. ACIAR partners with large scale NGOs such as CARE International, World Vision, HOPE Worldwide and People's Action for Rural Development, as well as many smaller organisations.

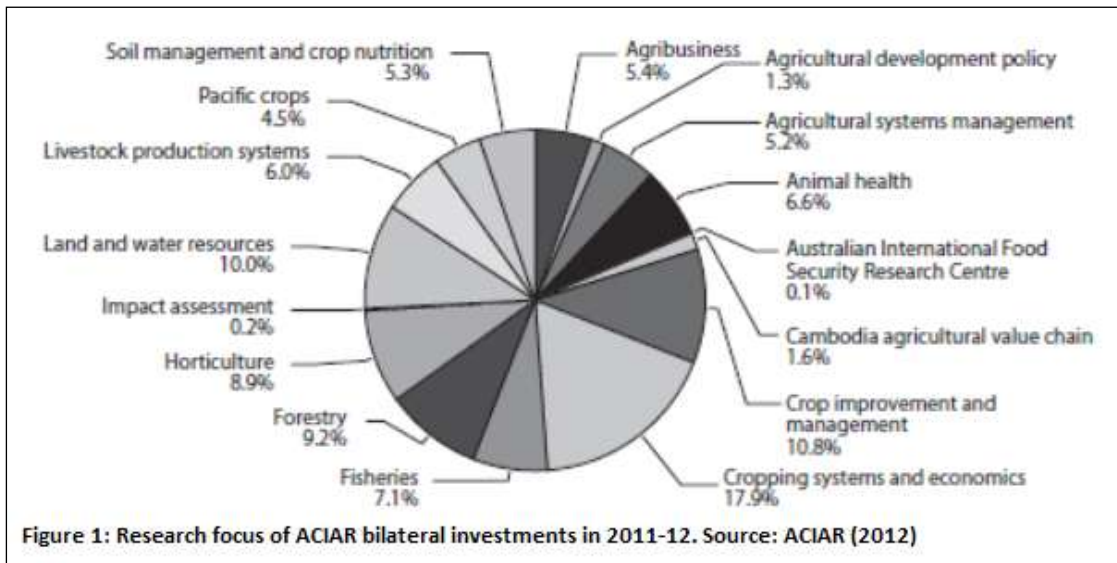
In engaging with NGOs, ACIAR operates as an investment consultant, helping NGOs tap into the International Agriculture Research Centre network. For their part, NGOs provide a key link through which ACIAR's research can be spread to vulnerable communities. For example, World Vision Australia's Area Development Program (ADP) - largely sponsored by child-sponsorship funds - implements ACIAR's research in capacity-building and development programs throughout the developing world. In Vietnam, ACIAR projects relating to [rodent control and soil fertility](#) have been successfully implemented by World Vision. NGO engagement of this kind contributes to fostering strong international relationships, and furthers ACIAR's regional leadership in agricultural development.

Quantitative returns on Australia's international public investment

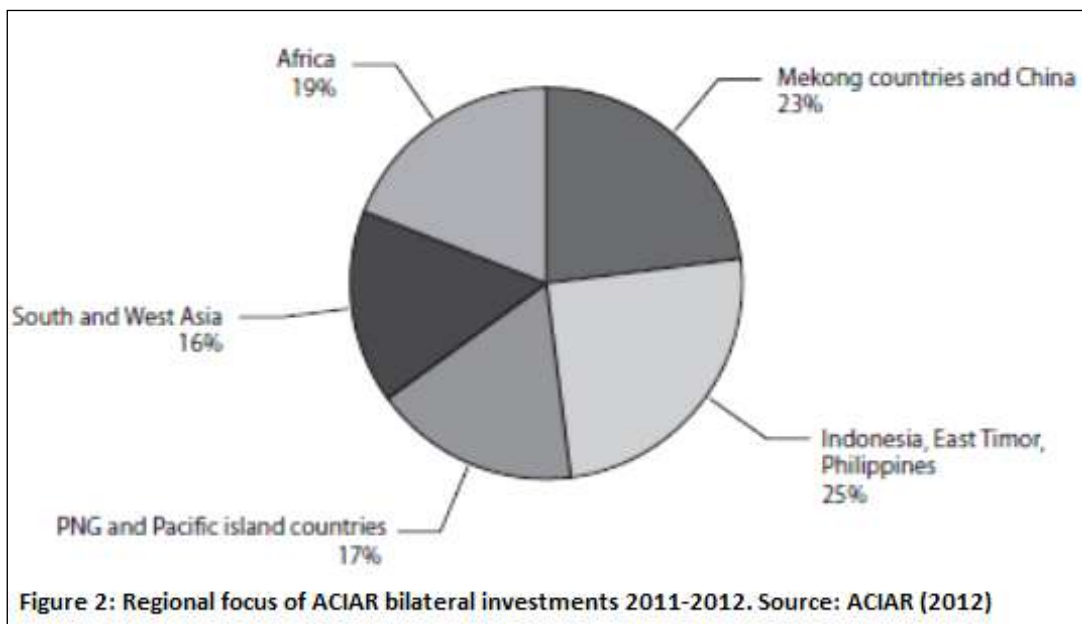
Since its foundation, ACIAR has invested approximately \$2.5 billion in collaborative agricultural research and capacity building in developing countries. ACIAR's activities aim to contribute to poverty alleviation through both quantitative and non-quantitative inputs. Quantitative inputs seek to create economic impact. Non-quantitative inputs, such as implementing community development programs, go beyond this, providing social benefits. ACIAR research activities are organised into the following management units:

- Economics and Social Sciences (including agribusiness and development policy);
- Crops (including horticultural science and crop management);
- Natural Resources Management (including forestry, water resources and soil management); and
- Livestock and Fisheries.

Management units are then broken down into key sector units, as demonstrated by Figure 1.

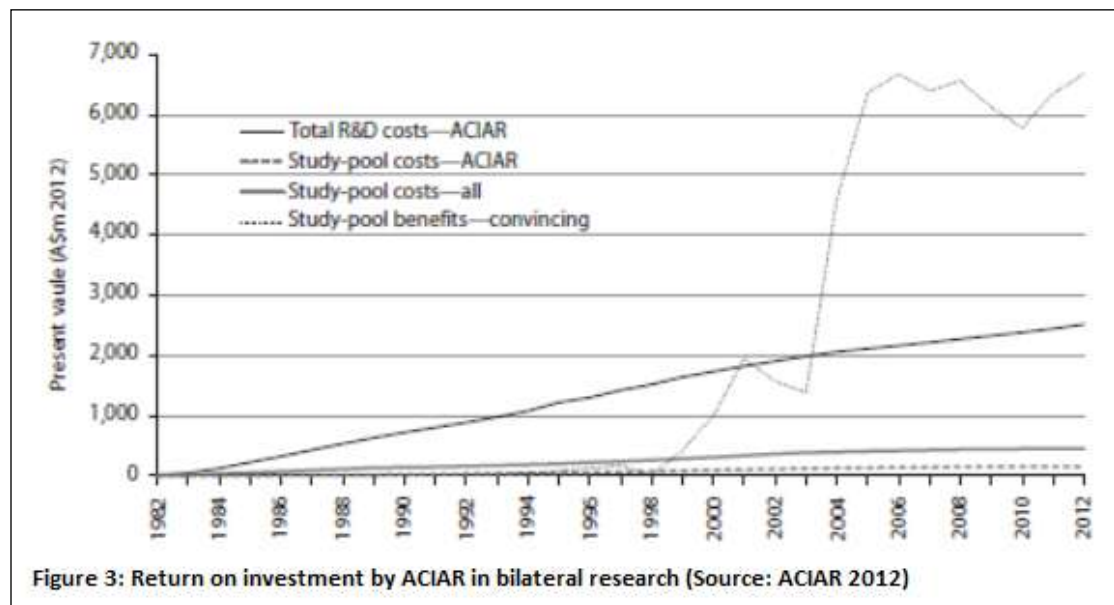


A 2013 impact assessment of ACIAR’s investments in bilateral agricultural research, found that its projects reflect Australia’s aid goals as well as its national research priorities. Currently, ACIAR has bilateral research projects in Papua New Guinea and Pacific island countries; Indonesia, East Timor and the Philippines; the Mekong countries and China; South and West Asia; and Africa.



The review aimed to assess the credibility of ACIAR’s reported benefit streams. 103 bilateral agricultural research projects from 1982-2012 were investigated. It showed substantial returns: the \$448 million invested by ACIAR and its partner organisations in the study-pool projects had created a \$30.17 billion in benefits to rural communities. Overall the ratio of total conceivable benefits to combined investment was 67:1, while the direct benefit, or cost ratio for realised benefits, alone was 15:1. The study also found that a small number of highly successful projects ‘carried’ the rest. For example, the use of Australian germ-plasm in

Indonesian forestry, pig breeding in Vietnam and integrated pest management in stored grain in the Philippines accounted for 55 per cent of all conceivable benefits.



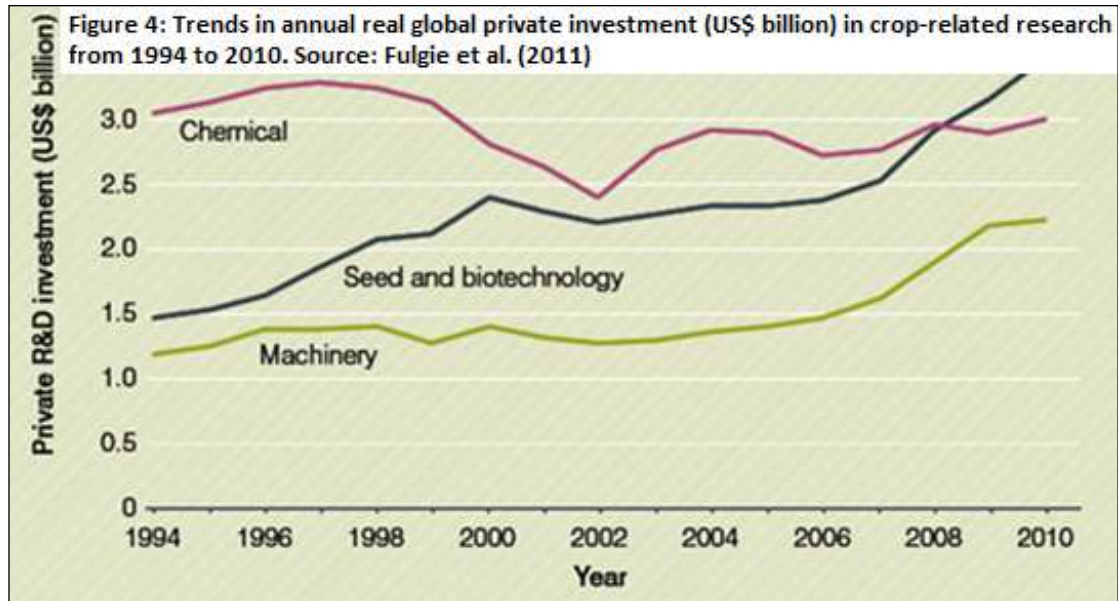
The data collected is clear evidence of the high economic return that can be expected from public investment in international agriculture. These returns can contribute to the Australian government's profit pool or be re-invested in the R&D sector.

Qualitative benefits of international RD&E

Beyond quantitative returns, there are wide-ranging qualitative benefits that stem from investment in international RD&E. Grassroots development projects that engage local communities and educate smallholder farmers create social development, increase community health and foster environmental protection. The interaction with researchers from developing countries is intellectually stimulating for Australian scientists; furthermore, it is beneficial to Australia in the long run via the creation of international academic alliances. For example, Australian farmers are particularly dependant on other parts of the world for crop breeding discoveries to improve traits such as disease resistance and quality. All crops grown in Australia are exotic; via international scientific relationships, Australian farmers can keep informed on current horticultural practices.

Encouraging the private sector

Similarly high returns can be expected from private investment in international rural development. The Australian government could do more to encourage private enterprises to invest in this area. Although private enterprises by definition do not have indefinite social obligations, many hold the capital required for fast progress. Recent data indicates an upward trend in global private investment in agricultural RD&E, especially in horticulture and biotechnology.



Most private international investment in agriculture is undertaken in the US and Europe. The “big seven” seed companies (Monsanto, Dupont, Syngenta, Limagrain, KWS, Bayer and Dow) are responsible for the majority of developments in crop-related research and development internationally. This research creates enormous private profits and spill-over benefits for developing countries.

The growing dominance of these companies, particularly in the global seed industry, is of concern as it discourages Australian enterprises from increasing expanding overseas. The public sector can assist to create incentives for private companies to invest, particularly in growing areas such as minor crops and productivity-related agronomic research. These areas attract little private investment, which instead tends to be directed towards more immediately lucrative ventures such as food technology, plant variety protection and patents.

The dominance of large multinational companies has also meant that the priorities of large scale agribusinesses have come to dominate agricultural innovation. Research funded by firms like Monsanto has focused on the technological advancement of crops that are integral to the food security of the world’s most developed nations such as maize, wheat, canola and soybeans. Thus, the food priorities of developing countries tend to be neglected. The UN Special Rapporteur on the Right to Food stated in [2008](#) that multinational corporations almost entirely neglect the five most important crops to the world’s poorest countries: sorghum, millet, pigeon pea, chickpea and groundnut. If the Australian government is serious about contributing to food aid through agricultural development, it should incentivise private research into minor crops that are integral to the livelihoods of smallholder farmers in the developing world. Australia’s poorest and most populous neighbours largely rely on subsistence farming for food security. Directing private investment towards crops that are important for these farmers is therefore significant both for aid engagement and to advance Australia’s regional security.

ACIAR's impact: assessment by the Crawford Fund

Among Australian NGOs, the Crawford Fund plays a key role in increasing Australia's engagement in international agricultural research, development and education. The Fund actively promotes international agricultural development as an engine for global economic progress with the support of the ACIAR, the Consultative Group on International Agricultural Research (CGIAR) and DFAT's aid program. In 2013, it developed a National "Doing Well by Doing Good" task force to report on Australia's current position and progress in international agricultural research.

The [2013 report](#) analysed ACIAR's impact and made the following key findings:

- ACIAR must align its portfolio more closely with Australia's national primary industries RD&E frameworks;
- ACIAR should supplement its current impact assessments by including a measurement of how participation in international research can strengthen Australian institutions;
- Funding for Australia's international agricultural research should grow at least at the pace of inflation and more should be done to explore greater private sector participation in this area.

The report found much of ACIAR's investment was effective in increasing the production of nutritious food in the developing world. It also found that ACIAR's work serves Australia's national interests of regional peace and security; benefits Australian farmers; contributes to Australia's agricultural knowledge and capacity; and is integral to Australia's leadership in the international agricultural development sector.

In order to maximise our impact, Australian policymakers need to focus programs to link Australia's strengths and needs with the needs of developing countries. Policy thinkers have argued that Australia's development assistance budget is [too small compared to other developed nations](#). A commitment from the Australian government is needed urgently to address global resource management and threats posed by the impacts of climate change.

Food Security Management

International food security management is another area in which Australian research can be effective. While current international food production levels are enough to feed the global population, inequalities in food access and distribution mean that food insecurity persists. In this sense, it would be effective for the Australian government to increase its research efforts in food distribution and rural community building.

Conclusion

Food aid is important in addressing emergency situations, but it does not provide a long-term solution to the problem of population under-nourishment. By contrast, investment in international agricultural R, D&E can result in long term solutions to the problems of global food production, of which returns are consistently high. The Australian government engages in rural development programs through ACIAR that feed 500 million people worldwide and empower rural communities through training and capacity building.

The Australian government could do more to create incentives for private investors to finance rural RD&E, both domestically and internationally. In particular, government incentives are needed to encourage private enterprises to invest in the development of agronomy suited to subsistence farming in the wider Asia Pacific region. Long-term public-private collaboration will be essential to ensure the success of research programs.

International agricultural RD&E's contribution to Australia is two-fold: it assists Australia's aid objectives, and contributes to Australia's efforts in economic diplomacy which are necessary for regional security. Scientific innovation and capacity building foster increased production and improved rural management in the developing world. The creation of strategic alliances with international research centres also serves Australia's national interests, broadening our regional and global engagement. In short, investment in international R, D&E is an effective means of enhancing domestic and global food security, and should be higher on Australia's development agenda.

Any opinions or views expressed in this paper are those of the individual author, unless stated to be those of Future Directions International.

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