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Australia's International Research Collaboration: focus on primary production and natural resource management

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Natural resource Development

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Executive summary

Australia was, is and will be a major player in international research for as long as Australians need cures for sickness, need feeding and need access to hard technology. Australian scientists will be welcome in the international arena for as long as our Universities provide top quality graduates able to contribute to the international networks which form the basis of contemporary innovation.

Investment at the Government level should be focused on value for money and the easy ways of disposing of bulk research dollars should be looked at carefully.

At the institutional/project level, care must be taken to ensure that, in the case of supporting the development of natural resources in less developed nations, proposed projects are really going to benefit primary producers. The impact of the constraints that are lined up for relief should be clearly defined in absolute terms. It is suggested that agricultural research projects aimed at developing countries are unhitched from Australian agricultural issues.

It is suggested that the information provided by agricultural research projects should be delivered by an organization specialised in extension modalities and methods. There is currently frustration that there are no means of getting the new technology to the farming communities for which it was intended.

It is suggested that a tropical university should be encouraged to initiate formal training in natural resource development relevant to the needs of Australian and overseas professionals, especially those from less developed countries in the region.

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[1] **Who is John Wightman?**

I am an agricultural scientist who graduated with a doctorate in agriculture from the University of Bristol, UK. I was a scientist the NZ Department of Scientific and Industrial Research for 15 years and then worked in India for 13 years as an International Principal Scientist in the International Crops Research Institute for the Semi-Arid Tropics, one of the CGIAR's premier research institutes. Although based in India, I worked across sub-Saharan Africa, South, and SE Asia. As Leader of the Groundnut Group, I worked in partnership with scientists in the erstwhile DPI, working out of Kingaroy, Queensland. I moved on from the CGIAR to USA where, as a consultant, I supported ACIAR, UNDP, The World Bank, the international Crop Life sector, including Syngenta, and International NGOs. This continued after my family and I moved to SE Queensland where we converted a hoop pine plantation into a 5 ha native flower farm. Recent consulting assignments have been in Vietnam and The Solomon Islands: projects were at least partly funded by the Government of Australia.

Preamble: *The comments that follow do not mark an overall dissatisfaction with Australia's performance as an international provider and collaborator in research that is aimed at enhancing natural resource management in lesser developed countries: quite on the contrary. If we carry on as we are we shall continue to do good job.* But I believe that my experience of having worked within the system, and, on other occasions, of observing, as a partner, from the outside, have given me the opportunity to highlight a few areas where we can do better in all phases: project seeking, definition, execution and step-up. As such my comments focus most on the 4th and 5th Terms of Reference as set out by the House Standing Committee on Industry, Science, and Innovation.

Terms of Reference

1 The nature and extent of existing international research collaborations.

2 The benefits to Australia from engaging in international research collaborations.

3 The key drivers of international research collaboration at the government, institutional and researcher levels.

4 The impediments faced by Australian researchers when initiating and participating in international research collaborations and practical measures for addressing these.

5 Principles and strategies for supporting international research engagement.

Underlying Philosophy

I believe that Australian dollars invested in international agricultural research collaborations should have a transparent objective of enhancing agricultural productivity and securing the livelihoods of rural communities in Australia's primary sphere of interest – specifically the Pacific Rim, encompassing the Pacific Community, S and SE Asia, (and even N and E Asia if appropriate). If Australian farmers and institutions can also benefit from these activities – that is a huge bonus (but it should be a secondary consideration and not be the primary objective of an engagement). The risk is that international projects are initiated to fund research that is perceived to be of benefit to Australian farmers or Australian Institutions, but which has failed to receive support from domestic sources – these things can happen.

The interactions with the national agricultural research and extension system (NARES) of the partner country should be directed at food security or rural livelihood related constraints. *The intensity or significance of these constraints should be documented in absolute terms, and might have to be defined as a preliminary to or part of the early stages of a project.*

Addressing the ToR

Responses to 2 and 3 are fairly superficial but may reinforce comments on these subjects from other people.

1 The nature and extent of existing international research collaborations.

The relevant information is presumably available to those who operate closer to Canberra.

2 The benefits to Australia from engaging in international research collaborations.

Cutting edge research in 2010 **is** international. The focus on the modification of sub-cellular processes to solve medical and natural resource related problems requires specialist scientists in specialist laboratories. The reality is that the research needed to cure a disease or to develop a disease resistant crop may take place in a **series** of specialist biotechnology laboratories that may be located on different continents. Australian institutions and scientists are and should be contributing members to the international networks that have developed to ensure that technology and new knowledge is exchanged at the professional level. We may be off to one side geographically but IT will ensure that we are at the hub when progress is made. Without it we shall fall behind.

At another level, it is suggested that Australia (in effect AusAID) should be selective in when supporting international 'blocks' of research. Whilst Australia may benefit from the output of major players in the agricultural research arena, such as the CGIAR, most benefit from investment in this direction is achieved by seeking partnership with a CGIAR institute in a tightly defined project arrangement. More below. It is also suggested that AusAID should endeavour maintain control of major projects by appointing its own executive managers.

3 The key drivers of international research collaboration at the government, institutional and researcher levels.

Some key drivers for collaboration are:

- To benefit from technology developed or developing overseas. If scientists in California have developed methods of growing Eucalyptus trees faster – let us work with them and apply the results in our hardwood forests. Also to become part of international networks – above.
- To operate in areas where biosecurity issues make it unwise for research to be carried out in Australia. Biological control experts collect potential control agents (usually insects, nematodes or micro-organisms) from their country of origin and often need to evaluate their potential in a third country – Ascot or Kew in UK, Montpelier in France, etc. – before they can be considered for release in Australia.
- When the flow of information is from Australia to a developing county, Australia is in a position to demonstrate its **altruism.** This is of particular relevance in the SE Asia – Pacific Rim sector. This is the *big brother factor* and should not to be undervalued.
- Clearly Institutions and their staff gain a tremendous amount by enhancing their capabilities through working in partnership with the international research community.

4 The impediments faced by Australian researchers when initiating and participating in international research collaborations and practical measures for addressing these.

There are so many impediments, but overcoming them is part of the territory, part of the learning experience.

Getting beyond the trivial:

Projects turn out to be non-issues: The assumption is that if Australian scientists are supported to carry out research on natural resources in a developing country the outcome will benefit primary production or primary producers in that country and its region. If preliminary investigation is inadequate projects initiated by counterparts in developing countries may turn out to be non-issues if considered from the point of view of the primary producer. A huge crop breeding and selection program involving Australian universities, international research centres and national programs' research stations may have no impact if the farmers are already happy with varieties they grow – in terms of yield, flavour, and adaptation to local conditions. A risk is being drawn into research carried out for the sake of research.

The solution is to get down to the roots of the problem and establish whether a proposal is based on a serious constraint expressed by farmers or is a research station issue based on a particular researchers hobby horse, i.e., distinguishing between farmer/constraint orientated research or research orientated research for which the 'result' is already known.

This leads onto another factor. Counterpart scientists in developing countries can be hard to find: good ones more so. Furthermore, the good ones may well be taken off a project with little or no notice – leaving the whole process stranded. Similarly, assumptions that partners within a project will work together and meet agreed deadlines can be misguided.

While I have seen this happening I have also seen under-achieving scientists being replaced and region-wide projects meeting deadlines and exceeding expectations. It is always a good idea to link with organizations with a track record of reliability – for instance the Secretariat of the Pacific Community.

Scientists want to see their work applied: this is a problem created by the *apparent* gulf between ACIAR and AusAID. One the provider of technology, the other, the provider of development funding. I have been involved with ACIAR projects that have provided research output that was and still is desperately needed by millions of farmers. Project funds were extended to provide some step up activities (preparation of multi-language pocket books, etc.) thanks to the help of a host institute. But the information needed by all these farmers is just sitting in files – despite submissions for help to distribute it. ACIAR does research and is not an extension agency...AusAID cannot be bothered with $20 000 projects

The answer is a third organization mandated to gather up the research outputs from so many excellent projects and to process them for extension to the farmer clients for whom it was originally intended.

Different direction and another real problem: this is a difficult problem to solve. It is the problem of communication between the scientist and the administrator. It is particularly pertinent to the whole sphere of rural development in developing countries.

The scientist or development worker is a specialist in his/her field and needs to communicate to a government funding agency that there is a problem that needs serious attention and funds to support an R&D program. But there is no one in the funding agency with knowledge and understanding and hands on experience of dealing with rural development issues – so the officials take the safe way out and say 'no'. Perhaps a thousand children then die of starvation.

Why is this? Is it fantasy? It is a real problem and the reason for it is quite surprising – there is no University in Australia (or New Zealand) offering courses covering rural development or natural resource management in less develop countries. *Most 'specialists' in rural development were something else first.* They have learned the job in the field. They have extreme difficulty in communicating with their managers who are often young, and enthusiastic career public servants who have never been in the field. The converse is also true, of course. Perhaps even a six month diploma course (for old hands and new recruits) would help bridge this communication gap.[2]

5 Principles and strategies for supporting international research engagement.

My suggestion is that a project should be based upon:

1) The **application** of research that has been completed somewhere else, at a previous time (See below) (perhaps with location specific modification) for the relief of a specific constraint. Information specialists are perhaps more important than researchers in this day and age.

2) 'New' research is justified only if it is focused on a recently emerged constraint, including the definition of the impact of the constraint or new technology - in absolute economic and social terms,

3) Well worked protocols for the step-up phase which will support the NARES to extend the newly emerged technology to farmers through ICT/the internet, public broadcasting, hard copy pamphlets, private sector and NGO partners, as appropriate.

4)Training ('human resource development') of all kinds – NARES staff working in Australia, Australian specialists running courses in the partner country, regional seminars or workshops, etc.

ACIAR: It should be clear that these comments are mainly in the context of the work of ACIAR and its supporting organizations, and to a lesser extent of AusAID. I am aware that ACIAR works within a complex framework set by geopolitical, financial, practical and policy factors. I know that ACIAR as a whole and/or its professionals may sometimes feel it appropriate to move in a particular direction but finds it is limited by this framework: this is to be expected and encouraged in an organization that should focus outside the nine dots.

I know that University based biotech or R&D enterprises (e.g. Sugar Research, Uniquest) also have impact on the international sector, as do other private sector companies: I know of no negative connotations and have every reason to believe they are doing a good job.

This overall philosophy closely follows the strategy adopted by the agricultural research sector of the ACIAR-AusAID continuum except in certain details:

Do we need research?

- Agricultural research as we know it has been in progress for 160 years. It is quite likely therefore that many of the questions that may be asked of researchers have been answered in another context, indeed in some cases, they have been answered many times over. Admittedly new

[2] The lack of formal education in this field became clear in me during a review of research and extension facilities in the Pacific Community. I have been proactive by attempting to energize three Queensland universities to move towards setting up appropriate course for Australians and our neighbours – but there was no response beyond a superficial interest in the notion.

products and new crop types appear and needs to be tested by farmers. This is why we still need applied research. But, for the most part the **information needed to solve problems is available – in a hard copy or on the internet or in *someone's head or filing cabinet*. There is less need for research – *per se* – information can be provided to extension officers by information officers so they can test it in the fields with the stricken farmers.**

- Investing in off-shore providers: in the context of 'long histories', the Australian Government supports CGIAR institutes via AusAID. These institutes were set up 40-50 years ago to fulfil specific crop orientated goals, usually based on collecting and evaluating locally developed crop variants (germplasm) from around the world. The idea was to exploit the beneficial characteristics and incorporate them into locally adapted varieties. This has been done, sometimes with great success, but these institutes still carry on - delivering diminishing returns – pushed forward by elite committees that attempt to redefine their role. Research has moved on to another modality: *research networks based on the abilities of geographically separated specialists in public and private sector labs brought together to undertake specific tasks (and then dispersing to meet further challenges).* Rapid results and low investment into infrastructure are the order of the day. This approach to solving agricultural problems is a much better investment for Australian dollars. Genomics, marker assisted selection and bioinformatic analysis have replaced the traditional approaches.

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