

## ***Programmes, projects and learning inquiries: institutional mediation of innovation in research for development***

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**Abstract:** This paper contributes to an exploration of how innovation processes may be hampered or mediated within research for development (R4D). It does so by drawing on nearly three years of learning by Australian participants from the creation and implementation of an Australian-funded Africa Food Security Initiative (AFSI) and in particular a sub-component named the 'Learning Project' (LP). We critically examine this attempt at institutional innovation via the creation of a 'learning project' concluding that for systemic innovation, institutional innovation and change within the donor and external research organisations must also be within the system of concern. Institutional constraints and opportunities are explored including how the overall approach could have been reframed as an organisational innovation platform (IP) designing, managing and evaluating IPs at different systemic levels of governance i.e., in the collaborative program with CORAF/WECARD in West Africa and BecA in East Africa; in the constituent projects; in the collaborating organisations (e.g. CSIRO, DfAT) and at the level of personal practice.

**Keywords:** innovation platform, governance, innovation systems, institutions, learning

## **Aim of paper and outline**

This paper highlights the importance for staff in organisations that seek to foster innovation in R4D to engage in their own processes of learning from experience and promoting institutional change within their own organisations. Through the LP CSIRO aimed to do this by establishing a forum for staff engaged in the AFSI program to reflect on their experiences in supporting R4D (Ison et al. 2012). Here we reflect on that process of fostering innovation within CSIRO and present some learnings. The perspective is solely from the view of the Australian participants.

While the LP was not always effective in engaging lessons in a timely way, it has influenced design of subsequent CSIRO activity and offers insights for on-going innovation. The aims and evolution of the LP are described and the main conceptual and institutional aspects critically examined. A conclusion is that engagement with R4D demands attention to institutional innovation in external and donor organisations as well as in recipient contexts. An institutional innovation with promise for future R4D initiatives ‘designed’ by external donors and researchers is to frame activities or ‘interventions’ as nested innovation platforms (IPs) rather than just projects or programs.

## **Aim and evolution of the Learning Project (LP)**

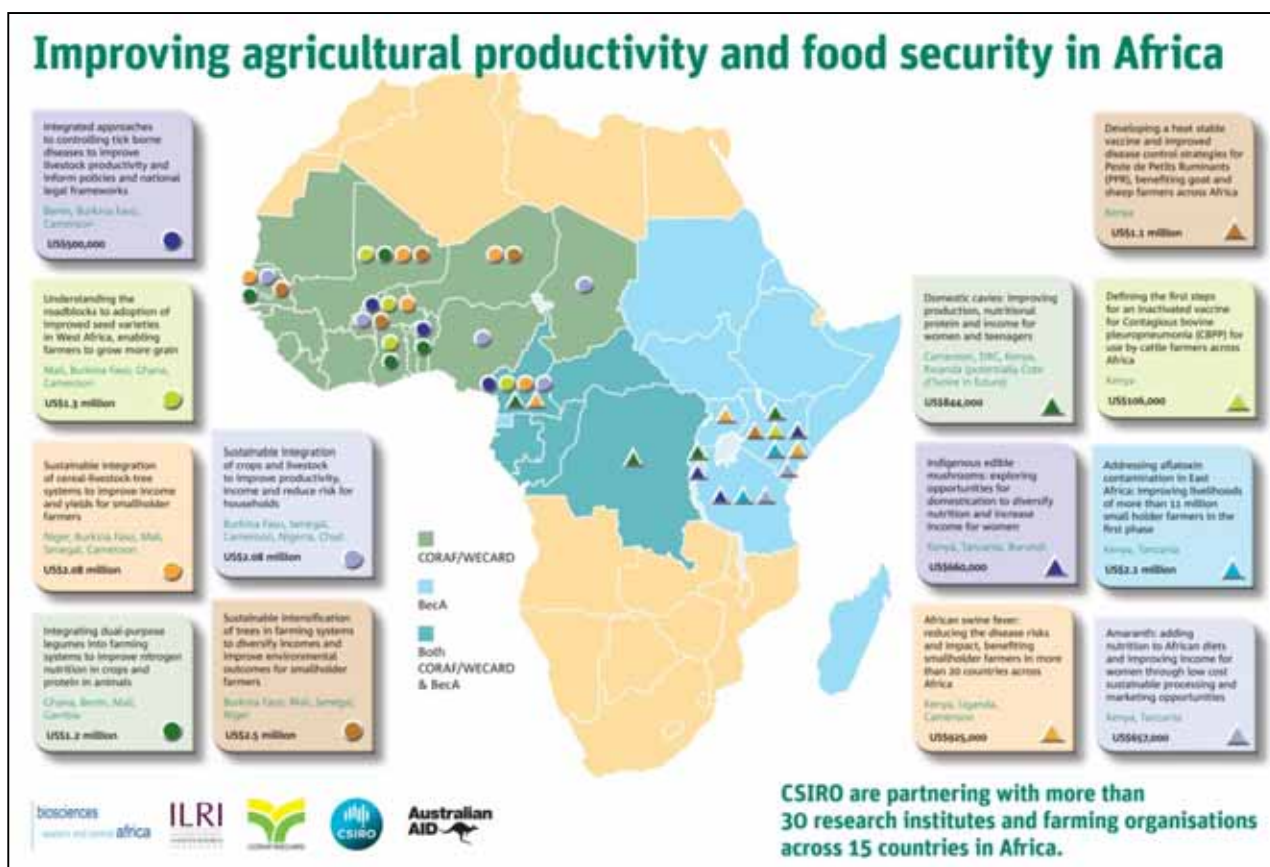
The LP aimed to aid CSIRO to engage in R4D more effectively, now and into the future. It was an institutional innovation in the sense that it set out to introduce a structured learning experience through: (i) inviting CSIRO staff to take part in reflective learning from their engagement in a program of R4D in Africa (the Africa Food Security Initiative- AFSI); (ii) providing optional guiding frame(s) for reflection (Ison et al. 2013b); (iii) developing an online site for sharing reflective data and (iv) fostering the emergence of collaborative inquiries around themes/issues that emerged from R4D practice and (v) facilitating some joint publications and presentations in workshops (Ison et al 2012; 2013a). The LP, for workload and ethical reasons was voluntary – Australian AFSI researchers had to make an active choice to participate. Other major design considerations included: (i) an action research focus; (ii) strong adherence to enactment in a ‘research with’ rather than a ‘research on’ mode; (iii) attempts to manage for emergence, especially of enthusiasm (see Ison & Russell 2007) and (iv) the possibility to extend the boundary of concerns to R4D research with Africa-based collaborators (e.g. see Ison et al 2013a). Hence the LP could also be considered as attempting to innovate in both methodological and theoretical terms in relation to R4D praxis (theory-informed practical action). Whilst the LP only succeeded in engaging 47% of the 32 CSIRO staff committed to AFSI in this structured learning process the experience of engaging with and managing the LP contributed to other initiatives that are promoting a stronger learning focus in CSIRO’s agricultural R4D.

The LP design has to be appreciated in the context of the overall AFSI program. The former Australian Agency for International Development (AusAID), now part of DfAT (Department for Foreign Affairs and Trade), responsible for managing Australia’s overseas development assistance program, commissioned CSIRO in 2009 to coordinate two R4D activities in Africa through partnering relationships with: (i) the West and Central African Council for Agricultural Research and Development (CORAF/WECARD) and (ii) Biosciences Eastern and Central Africa Hub hosted at the International Livestock Research Institute (BecA-ILRI Hub). The first partnership was designed to focus on increasing crop and livestock productivity through more efficient water and nutrient use and management, improving animal disease management and increasing services for smallholder farmers via more effective value chains. The BecA-ILRI Hub (herein referred to as BecA) partnership focused on increased human resource capacity for biosciences in Africa and high-quality research on identified constraints or opportunities for food security that had bioscience dimensions. In this AUD\$30M initiative AusAID contracted CSIRO to distribute funds to both CORAF/WECARD and BecA for projects selected and administered through their project management systems. In addition, CSIRO established a partnership fund to resource CSIRO and

other organizations to provide support to CORAF/WECARD, BecA and their contracted projects. The Learning Project (LP), the main focus of this paper, was resourced from the partnership fund in late 2011.

Within AFSI 13 projects were finally developed excluding the LP (Figure 1). This paper is not concerned with the details of these projects but it is important to note that project leadership was from a range of African and African-based organisations (from NARS and CGIAR centres) not from CSIRO. CSIRO scientists were not involved in project development (with one exception), due to the needs for transparency in the competitive selection and commissioning of the research projects. Rather most CSIRO scientists became involved at a late stage in the negotiation of project agreements, or during the early stages of implementation.

Figure 1: Projects and project details established in Phase 1 of AFSI and implemented during Phase 2; with funding from AusAID (now DfAT), CSIRO is leading AFSI with over 30 National Agricultural Research Institutes, undertaking 13 projects across 15 countries (Source: CSIRO, AFSI Program).



In the first half of 2013 the 32 CSIRO scientists involved in AFSI were committing a total of 11.66 full-time equivalents (FTE) per annum. Researchers came from four CSIRO Research Divisions and several Flagship Programs. In addition senior research managers, administrators and technicians (not quantified here) provided support as well as staff contracted from other Australian research organisations (nine 'local' externals were contracted by CSIRO e.g. Monash University for the LP). Conceptually and methodologically what is significant is that CSIRO had in-country as well as out-of-country collaborations to manage as well as internal matrix management across-Divisions (where staff are based) and Flagship Programs (where research activity is based). Thus, the LP was mainly an in-country, cross-organisational collaboration involving 15 CSIRO staff (to varying degrees) and three Monash staff (about 1 FTE p.a.) sitting across a CSIRO internal matrix structure.

Some CSIRO staff had prior experience of R4D, including in Africa, but for many engagement with R4D was a new undertaking. CSIRO researchers were primarily biophysical scientists with prior experience of taking largely technical and project management roles, including some experience and publication from action research (Carberry 2001; Carberry & Keating 2013).

### **IAR4D, R4D and IPs**

CSIRO entered into AFSI at a time when discourses on Integrated Agricultural Research for Development (IAR4D) were becoming established in West Africa and arguments for an innovation systems approach, including the purposeful creation of innovation platforms (IPs) were gaining adherents (FARA 2007; Hawkins et al. 2009). IAR4D was not well understood by most CSIRO researchers when AFSI began but the LP has played a significant role in facilitating CSIRO researcher engagement with IAR4D concepts. Some CSIRO staff had a more established understanding of IAR4D from research engagements in antecedent and concurrent projects (e.g., Sanyang et al. 2012). However, the antecedents to concepts like IAR4D, use of the reduced R4D form, and ‘innovation systems’ are obscure. Moreover most participating CSIRO scientists were not initially familiar with the distinctions between the concepts, nor the emerging interest in ‘institutional innovation’, and the potential role of ‘innovation platforms’ (IPs). Below we outline how these terms have come to be understood in the LP (Stirzaker 2012).

In the LP we understand institutions as arrangements and practices that constitute ‘norms and rules of the game’ (following North 1990); institutions are different to organisations although the latter is inescapably a network of institutions. Within this understanding projects and programmes as well as IPs are all institutions as is an M&E system; whilst often called a ‘project’ the LP was actually designed as a systemic inquiry (Ison 2010; Ison et al 2012).

Monty Jones (in Hawkins 2009) wrote: “*The Forum for Agricultural Research in Africa (FARA) proposed the Integrated Agricultural Research for Development (IAR4D) as an innovation system framework that should form the base upon which transformation of agricultural research in SSA should be considered. The IAR4D concept aims to deviate from the traditional linear configuration of ARD by encouraging the engagement of multiple actors along the commodity value chain for the promotion of the process of innovation in the agricultural system.*”

IAR4D emerges from a systemic understanding of innovation and change requiring interaction and learning at multiple levels. While IPs are part of the operationalization of IAR4D, Hall (2012) argues that IPs will not work without an associated systemic learning endeavour – part of the rationale for the LP. Pali (2013) argues that IAR4D is ‘an action research (AR) approach in which multi stakeholders interact in response to an issue in an innovation platform’; thus IAR4D and the LP had a common AR focus. CORAF/WECARD had adopted IAR4D and required that approach be used within the AFSI research program, with development of IPs as a key process. In contrast BecA’s business plan and the CSIRO-BecA partnership logic at the time of the inception of the AFSI program gave little overt consideration to the relationship between research and development outcomes. Absent in the BecA business plan and largely absent in the partnership projects at inception stage were institutions and capacity building to implement IAR4D principles of integration of perspectives, knowledge and action of stakeholders. Also missing was the integration of learning, analysis and change across levels of economic and social organisation and across environmental, social and economic dimensions of development (Maru in Ison et al 2013). As the partnership progressed, questions emerged of how these needs could be addressed and BecA’s 2013 Business Plan now encapsulates a broader agenda and responsibility of mobilizing bioscience for Africa’s development.

Although not widespread in the literature the term R4D has become common within the Australian AFSI program. This linguistic uptake can be understood as an acknowledgment of IAR4D (or

AR4D), admission of the possibility of a boundary shift beyond historical framings of innovation within a narrowly conceived agriculture (the A) and a reframing of research purpose i.e., research **for** development. It also exemplifies a ‘framing shift’ over time from West to Eastern Africa, in the context of BecA, and as mediated by CSIRO collaboration. Hawkins et al (2009) made the important point that they were proposing IAR4D as “*a set of ‘good practices’ or actions that synergistically add value to existing research and development processes.*” They did not “*see IAR4D as a particular research and development ‘approach’ or even a ‘framework’.* Nor did they see “IAR4D as ‘*a process*’, but rather *about* (the quality of) processes”; they regarded “development as being about behaviour and capacity, not outputs, and .. therefore [saw] “*IAR4D as focusing on improving behavioural processes and capacities as outcomes, rather than on just technology or policy outputs.*” The LP in its design had similar aspirations and though not always realised, it could, in retrospect, be conceived of as an attempt to build an IP within the Australian AFSI team.

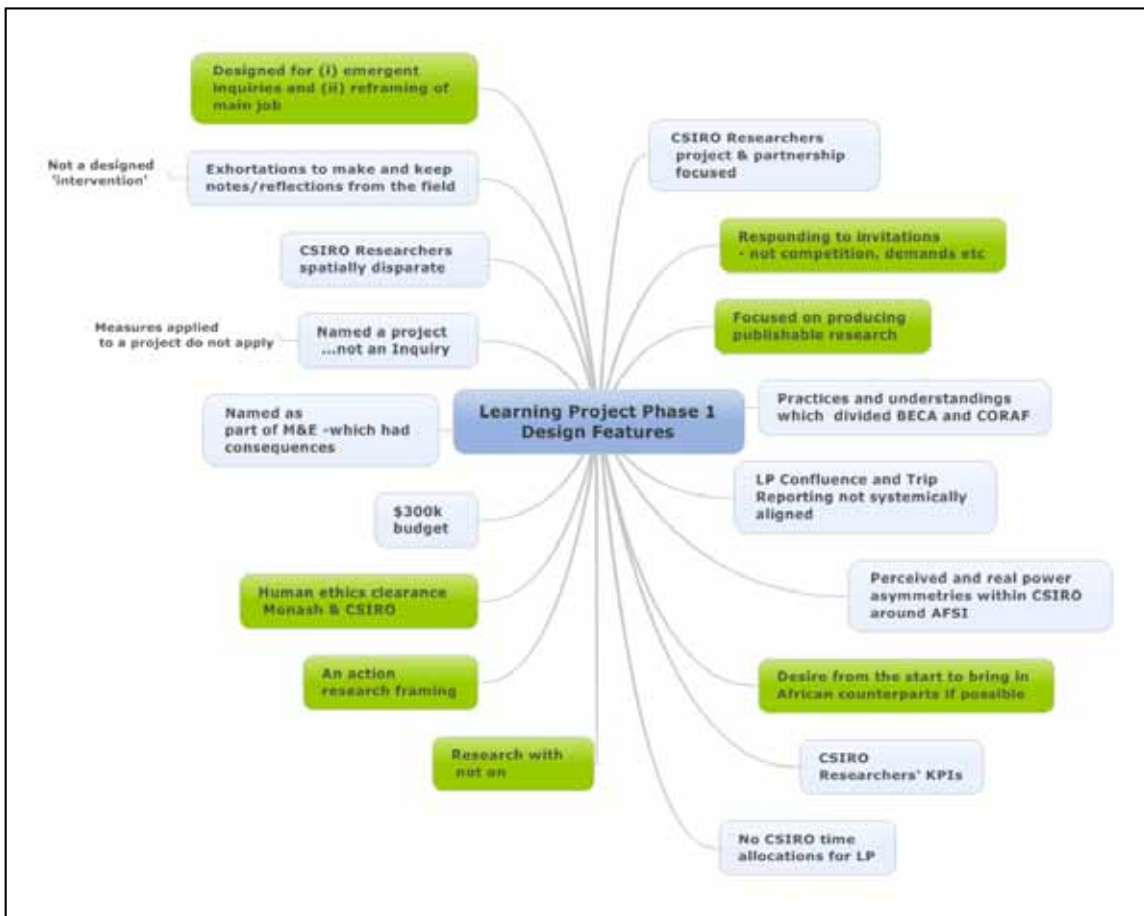
Hall (2012) has argued that the broader learning system dimensions are often overlooked in IAR4D discourse (see also Mbabu and Hall 2012). This has significant consequences as there is now widespread interest in how IPs can mediate innovation processes concerned with R4D but, unfortunately, IPs are often viewed as a bolt-on extension to the technology delivery pipeline, with little attention to issues of institutional change and any notion of IPs being part of a process of (i) stimulating learning for innovation and (ii) transforming the context so that the gains made from learning can be institutionalized (Hounkonnou et al. 2012; special issue edited by Jiggins, 2012). The LP was premised on the assumption that the capacity of CSIRO staff to foster these kinds of processes with partners in Africa through the AFSI-funded research would be enhanced by personal reflection, and sharing of their own learnings from engagement in AFSI.

Pursuing an IAR4D trajectory presents particular capability needs and challenges traditional institutional arrangements (Stirzaker 2013). Building on Jones (2011) these capabilities and arrangements need to: (i) be multi-disciplinary, multi-institutional, multi-stakeholder; (ii) involve diverse partners: e.g. farmers (including an emphasis on women in Africa), extension workers, policy makers, accountants (or in the case of Australian AFSI, biophysical, social and systems scientists and, possibly, funders) and (iii) require training in ‘soft skills’– communication, negotiation, conflict resolution. Action research is now underway in an attempt to build these skills and capacity within the ‘Australian Food Security’ R4D community.

### **LP design features and activities**

Figure 2 summarises some of the main design features of the LP (green boxes). The light blue boxes in Figure 2 summarise the constraining factors to the realisation of the LP design intent. As we outline, several of these can be understood as institutional constraints.

Figure 2: A summary of design features of the Learning Project (green) and some of the constraints to enactment that emerged (blue).



Participants in the LP (i) participated in an introductory workshop as part of a joint meeting of CSIRO researchers working with CORAF/WECARD and Beca; (ii) received a ‘framing document’ called ‘Notes for the Field’ (Ison et al 2013b) designed to encourage reflexive research practice; (iii) participated in irregular project telephone hook-ups; (iv) were provided with an on-line facility (Confluence) to engage in interactive on-line asynchronous communication and as a data repository; (v) received regular emails from Monash researchers inviting reflections on emergent issues; (vi) assisted with ethics clearance through both Monash and CSIRO; (vii) were provided with the opportunity to participate in one-to-one reflective conversations with a neutral (outsider) researcher about their AFSI experiences (Holder 2012); (ix) were invited to contribute to the design and development of emergent inquiries around issues/themes emerging from their practice (data not presented) and (x) were invited to join in joint writing activities such as this paper and internal reports. In the AFSI annual forum and on-line program meetings the LP was treated as another project. The extent of CSIRO staff engagement achieved varied across the activities. For example the Confluence site failed to engage researchers in the manner of an active CoP (Community of Practice) or on-line course. However, it has achieved its purpose of being a major data repository. The five emergent inquiries have proceeded at different speeds; inquiry four has led to field work in East Africa and publication of a research report (Ison et al 2013a) with prospect for collaborative follow-up with some African counterparts. Monash researchers had opportunities to contextualise their activities in both East and West Africa through field visits.

### **LP evaluation by participants**

An evaluative instrument was designed and used with LP participants in an end of project review meeting the primary purpose of which was to consider design parameters for a possible new and extended phase of the AFSI program (data not presented). LP participants who had been most active were present (just under 50% of those who had volunteered). Held on 13<sup>th</sup> February 2013 there were 11 participants of whom six were from CSIRO. Most responses (Table 1) ranged from “Neutral” to “Strongly Agree” in relation to the set of 10 statements that formed the evaluation. However, responses were significantly divided in relation to those statements that described the LP as being on the right trajectory and having arrived at a good place suggesting LP participants as a learning community, had divergent views around the progress of the LP. Two participants indicated a dramatic change from a disagreeable to an agreeable viewpoint after completion of the workshop; insights emerging from questions posed in this evaluation are now presented.

#### ***My enthusiasm for a learning emphasis has grown***

A second-order systems emphasis which saw researchers as central to their own research practice (Ison 2010) was new to many participants and failed to engage many CSIRO AFSI staff at all. Critiques or points of discomfort from those who did engage included the lack of a focused question such as how to get impact from the research? Or What is the role of research(er) in innovation? Negative criticism was also directed by participants at the functionality of the online portal established for LP participants to compile and self-publish reflections and contribute to LP inquiries. In spite of such areas of discomfort, most of the participants in the review workshop reported that their enthusiasm for a learning emphasis had grown.

#### ***The institutional arrangements for a more focused shift towards learning need to change***

While M&E for development-funded programs can be reductionist, good practice in development evaluation draws from a wide range of methodologies and epistemologies appropriate to the program in question. This means there is plenty of scope to integrate with complexity and systems thinking. An issue with the LP was that its relationship with the M&E component of AFSI (where it was originally located, at least verbally) was not well sorted conceptually and methodologically. This is a critical point as there was almost no link between the LP and M&E (despite espoused intent); each was conceived of, scoped, and resourced quite separately. A key lesson from our experiences with the confusion between M&E and the LP should be that both should be conceived of and conceptualised together - as elucidated in the discussion it should be possible to develop an adaptive whole. There are positive signs: as a result of LP influences and feedback from mid-term reviews the term MEL (monitoring, evaluation and learning) has now entered the CSIRO AFSI discourse, including follow-up projects. There was also no organised engagement by CSIRO researchers assigned to AFSI projects with the AFSI program level M&E other than data provision. This is in contrast to the invitation to participate in the LP and its co-research mode of operation. Significantly the LP was not part of the mid-term AFSI review led by Hall (2012). However the main review recommendations were consistent with the design aspirations of the LP.

Other institutional arrangements that presented difficulties or lost opportunities included ‘trip reports’ prepared by all staff after field visits, the AR focus and individual KPIs and the management of workloads.

#### ***The LP was constrained by its initial design parameters***

The relationship between Monash University LP facilitators and most CSIRO staff engaged in AFSI was new at the start of the LP. Development of a strong relationship and mutual understanding of the LP’s aims and methodology was constrained by available time of both Monash and CSIRO staff, the fast moving pace of implementation of AFSI partnership research projects

involving considerable travel to Africa for CSIRO staff; and geographical separation of the various CSIRO participants and Monash University staff.

Of the 47% (15) of CSIRO AFSI staff who volunteered for the LP only about half were consistently active in the LP. In many ways this is understandable given the range of constraints outlined in Figure 2. CSIRO staff in AFSI varied in their time allocation to the program from 3-100% (FTE); of the staff participating in the LP, AFSI allocations (which excluded the LP) ranged from 8-50% (FTE).

### ***Boundaries of the 'system of interest'***

Whilst CSIRO staff were encouraged, through the LP, to engage in reflective processes in concert with their African-based counterparts as well as individually, the LP was not initially focused on engaging CSIRO's African based partners. However, LP participants raised the need to broaden participation if the LP was to effectively inquire into more effective R4D. CSIRO staff recognized multilevel institutional innovation was required and that structured reflection and sharing of learnings across the partnerships and project participants would be useful (but was beyond time and budget resources for the LP – see Figure 2).

### ***Institutional change congruent with the LP***

The LP has been part of a mix that has seen significant changes in understanding of CSIRO's R4D mission. Central to these changes has been a common 'champion' and, in a politically fraught context, the establishment of very good relations between CSIRO and their main African partners, although unfortunately the development of this relational capital is too often downgraded through the design and implementation of M&E instruments. Arguably the LP indicates the necessary interaction between leadership for institutional change and reflection and learning by engaged others.

## **Discussion**

There are lessons for multi-level institutional innovation in R4D that emerge from the LP. One is that it is important for the staff of organisations that seek to foster innovation in R4D to engage in their own processes of learning from experience and promoting institutional change within their own organisation. This reflects the proposition (Hounkonnou et al. 2012) that institutional change is required for innovation in agriculture and rural development, and more broadly that the opportunities for action and outcomes that people experience depend on institutions. The focus of this paper is on the CSIRO experiences of attempting to do this, reflecting the LP's original framing and conduct.

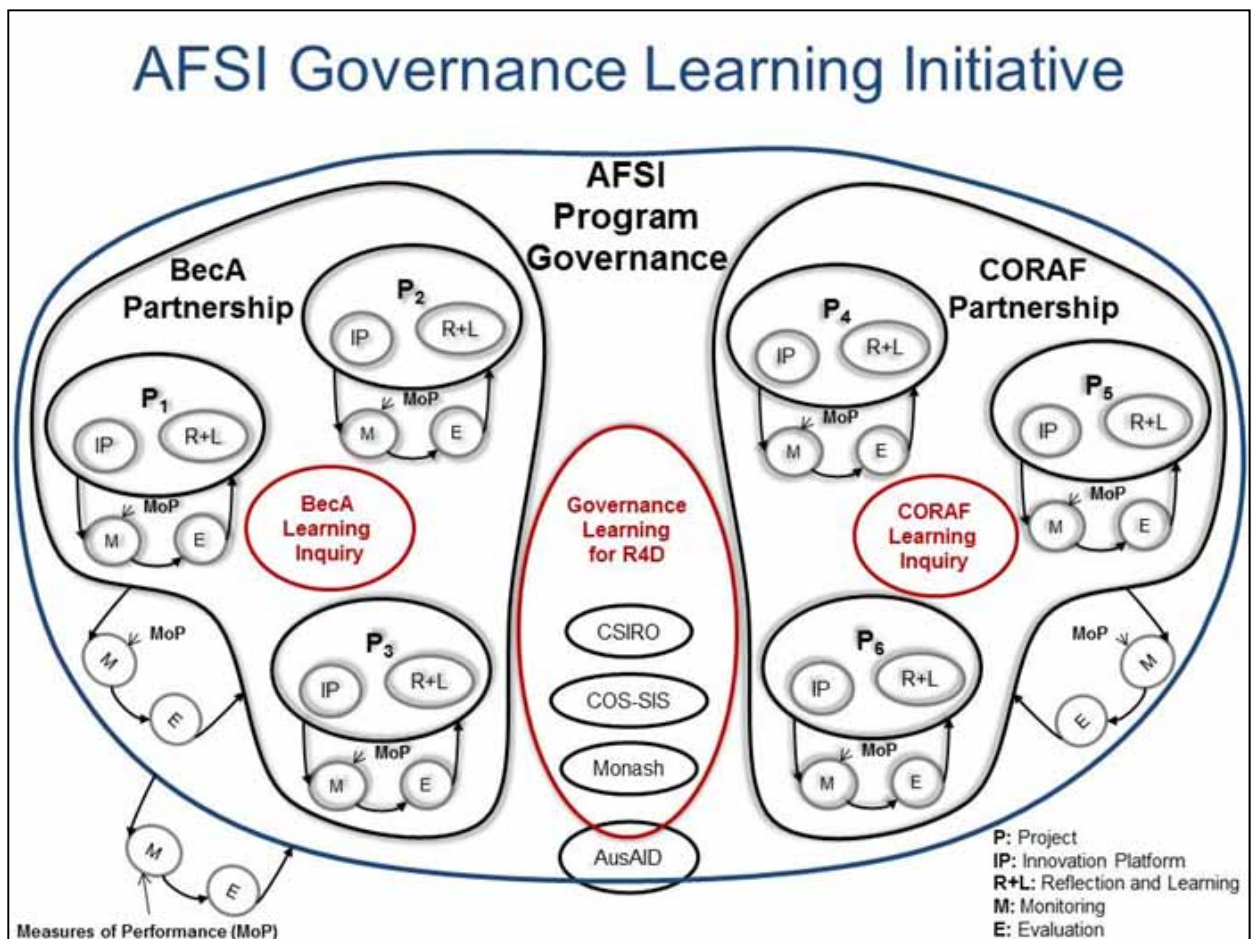
The understandings that institutions shape and enhance or constrain practical action is not new, but the experience of the LP is that these understandings are not widespread and the means to talk about the issue are often lacking. What is less prevalent in the literature is an identified need, when attempting systemic innovation, to appreciate the institutional 'baggage' of the external funder and/or researchers and their organisations. This absence reflects a particular way of framing situations (Schön and Rein 1994) that is not truly systemic (Ison 2014) because the relational dynamic between insiders and outsiders is never fully appreciated. In our case the funders (AusAID) and outsider researchers (CSIRO) bring their politics, theories of change and implicit and explicit theoretical and methodological understandings (e.g. disciplines) to the collaborative situation (program or project) where they face local people at program (CORAF or BecA) and project level who too have their politics, theories of change etc. Then of course there are the differing cultural traditions of the researchers, administrators etc., - in this case Australian, Franco-phone, Anglophone, biophysical or social research/researcher traditions. For program or project-



based R4D to succeed they must be capable of creating an effective performance (a relational dynamic) amongst these multiple actors just like the players in a new band or orchestra.

There is a trap of language and thinking that arises when we name, and think of, things in isolation from the processes of which they are a part (Koestler 1967; 1978). In other words when actions are isolated conceptually, practically and methodologically in a project situation (outside) from the same set of considerations in program and project framing, design and conduct (inside) then systemic coherence can too easily be lost e.g., whether the outside research team has the right mix of social and biophysical scientists and thus the requisite skills set that such mixes enable (Ison et al. 2013). Many critics of past practice in agricultural R4D implicitly, if not explicitly, point to loss of systemic coherence, and its absence is an argument for systemic innovation approaches (Hall and Clark 2010; Hall 2012). Systemic coherence between the outside of on-the-ground projects and the inside of program design and logic, what is increasingly referred to in the Australian donor context as the ‘program theory of change’ is, we will argue, a matter of achieving the systemic governance of a series of nested IPs (rather than projects, programs etc – Figure 3).

Figure 3: A conceptual model of a possible AFSI-like program understood as a governance learning initiative with nested partnerships, P (e.g., BecA and CORAF) and projects understood as innovation platforms (IP).



What emerges from our reflections is the idea that if we were going to set up a Learning Project again, from scratch, we could set it up as some kind of meta-IP at the centre of a governance system (Figure 3). We say meta-IP because it is realised that it would not be possible to get all the participants together in one room and at different times; thus the focus of the IP would be on dif-

ferent aspects (e.g. learning in CSIRO, or learning in CORAF, or learning in NARS) rather than simply focusing on different aspects of a linear value chain with the overall aim of selling more of something, for a better price, and better returns, to villagers. We can envisage using IP principles to encourage learning within what would turn out to be a fairly complex network of actors and orchestrating a nested set of IPs within a systemic governance learning framing. The challenge would be to devise practices and institutions that mean that all could learn from this process, with the overall aim of improving capacity in CORAF, CSIRO, NARS, etc.

We think there are opportunities in future AFSI-like programs to move M&E from a systematic (a method that is repeatable through a step by step procedure, marked by regularity and predictable cause effective relationships between action and outcome) to a systemic (an adaptive method that responds through feedback loops to the contingencies of dynamic systems phenomena, marked by irregular and unpredictable cause effect relationships between action and outcome). Such a shift does not involve abandoning the systematic but situating it within the systemic - as in Figure 3. Importantly this involves approaching things differently from the start. From a R4D perspective abstracting a problem from context breaks feedback cycles and the ability to achieve systemic innovation ranging from the plot to the marketing chain.

A lesson for CSIRO is the need to deliberately address institutional capacity (i.e. the institutional arrangements and institutional culture) that affects how research staff are deployed. Within the space available to it the LP stood on particular theoretical ground (Ison and Russell 2007; Ison 2008; 2010). Values and incentives for involvement that have been articulated at different times were that individual reflections will assist a researcher with improving praxis, and will lead to potential publications through action research and learning type inquiries. Some LP participants reflected that the AFSI focus led mainly to concerns with how to do the science (research) but shallow concerns with how to govern the interventions through the different projects, in different contexts and on how to deliver outcomes given the principled roles that were taken – partnering, leading from behind, and mentoring. For some this created a mismatch between incentives offered and what people were likely to reflect, given their roles.

If the LP was to have been an organisational IP it would have needed stronger championing from all or many leaders of AFSI at a partnership and CSIRO level, had a clear mandate to support collective and individual learning at project levels and an organisational expression and a process (feedback mechanism) that connected these levels. This may have led to dialogue and appropriate changes in response that could have acted as a strong incentive to continue engaging with the learning initiative. Considerations are that changes in understandings and practices needs time, engaged leadership is needed, engagement of actors outside their comfort zone needs to happen and be supported and shared reflections across people in different organizations and institutional settings have a role.

## **Conclusions and future research**

This paper documents the history of an attempt to embed systemic learning in a large-scale multi-partner agricultural research program. This history suggests that existing institutional arrangements and praxis around such programs continue to present obstacles that constrain systemic learning. Systemic learning is required as a routine element of development investments designed to help multiple actors usefully engage in the process of innovation and change. The LP experience suggests that one way to move forward, particularly in a program based around the establishment of IPs, is to reframe a learning project as an organisational IP designing, managing and evaluating IPs at different systemic levels (Figure 3). This would make its facilitative role in enabling institutional innovation explicit and this would signal its centrality to a program such as AFSI.

Requisite institutional change for systemic innovation is not likely from any single initiative. The role and impact of leadership appears to be critical, and a better understanding of this is warranted as part of generating conditions that support institutional change. To return to the questions relating to institutions and R4D practice that motivate this IFSA Forum we conclude that responding to these questions also involves (i) appreciating or understanding the institutional landscape and its complexity; (ii) appreciating which institutions constrain and which enable and (iii) knowing how to institutionalise findings/learnings i.e., project/program sustainability.

The LP was not embedded as part of the doing of “IAR4D” in West Africa or the less well defined R4D in East Africa. It was never seen as an essential element of “rethinking” and “redoing” research in a new more impact focused way. Despite intellectual buy-in by key players in CSIRO and an intuitive feeling that lessons could be learned there was no operational buy-in that would allow the LP to play an integrated embedded role of driving learning and institutional change and thus innovation. Without this embedding from the start, it was doomed to operate at the periphery from where it had little chance of playing the role that one might envisage for it.

The experiences of CSIRO in this regard are not unique. The challenge is not the individual scientist, but determinants of the overall paradigm in which they operate. Globally, there appears strong resistance to the appreciation that conservative institutional arrangements around IAR and the persistence of framing narratives that are reductionist, deterministic and highly techno-centric in regard to the innovation processes act as a major bottleneck to development effectiveness (e.g., Sumberg et al 2013). A key challenge for both future studies and practice is to gain a much clearer understanding of the political economy of this conservatism and to identify ways of institutionalising systemic learning as part and parcel of the research and innovation process. Without progress in this direction the power of science for the greater good of society will continue to be undermined.

## References

- Carberry P.S. 2001. Are science rigour and industry relevance both achievable in participatory action research? In 'Proceedings of the 10th Australian Agronomy Conference'. Hobart, Tas. (Australian Society of Agronomy/The Regional Institute: Gosford, NSW) Available at: <http://regional.org.au/au/asa/2001/plenary/5/carberry.htm>
- Carberry, P.S. and Keating, B. 2013. Sustainable intensification & Sub-Saharan Africa. Presentation. Accessed as: Carberry+CSIRO+sustainable+agriculture+flagship+CTA+COC-SIS+Feb+2013pdf 15th January 2014.
- Hall, A., Clark, N. and Naik, G. 2007. Technology supply chain or innovation capacity? Contrasting experiences of promoting small scale irrigation technology in South Asia. UNU Merit Working Paper #2007-014.
- Hall, A. and Clark, N. 2010. What do complex adaptive systems look like and what are the implications for innovation policy? *Journal of International Development* 22: 308-324.
- Hall, A. 2012. Unpacking IAR4D and a Framework for Developing a Portfolio of IAR4D Projects. In: Mid-term evaluation of the CSIRO-AFRICA, food security partnerships, report 1: the CSIRO-CORAF/WECARD partnership, August 2012, CSIRO, Unpublished.
- Hambly Odame, H., Hall, A., and Dorai, K. 2012. Assessing, Prioritizing, Monitoring and Evaluating Agricultural Innovation Systems. In *Agricultural Innovation Systems: An Investment Sourcebook*. World Bank: Washington, D.C.
- Hawkins, R., W. Heemskerk, R. Booth, J. Daane, A. Maatman and A A Adekunle 2009. Integrated Agricultural Research for Development (IAR4D). A Concept Paper for the Forum for Agricultural Research in Africa (FARA) Sub-Saharan Africa Challenge Programme (SSA CP). FARA, Accra, Ghana. 92 pp.
- Holder, R. (2012) Combined key learning points – AFSI/CSIRO learning project conversations. Unpublished report, Monash University
- Hounkonnou, D, Kossou, D, Kuyper, T.W., Leeuwis, C., Nederlof, E.S., Röling, R., Sakyi-Dawson, O., Traoré, M. and van Huis, A. 2012. An innovation systems approach to institutional change: Smallholder development in West Africa. *Agricultural Systems* 108: 74–83.
- Ison, R.L. (2008) Systems thinking and practice for action research. In Reason, P., & Bradbury, H. (eds.). *The Sage handbook of action research participative inquiry and practice* (2nd edn). Sage Publications: London, pp. 139-158.
- Ison, R.L. 2010. *Systems practice: How to act in a climate-change world*. Springer, London and The Open University, Milton Keynes.
- Ison, R.L. 2014. What is systemic about innovation systems? The implications for policies, governance and institutionalisation. In Judith Francis and Arnold van Huis eds., *Innovation systems: towards effective strategies in support of smallholder farmers* CTA/WUR, Wageningen.
- Ison, R.L. & Russell, D.B. eds 2007. *Agricultural Extension and Rural Development: Breaking Out of Knowledge Transfer Traditions*. Cambridge University Press, Cambridge, UK. 239p.
- Ison, R.L., Holder, R. & Davies, J. 2013a. Integrating social and biophysical researching in R4D: African food security initiative researcher perspectives MSI Report 13/6, Monash Sustainability Institute, Melbourne, Australia.

Ison, R.L., Wallis, P. Bruce, C., Stirzaker, R. and Maru, Y. 2013b Enhancing learning from AFSI research: Notes for the Field. MSI Report 13/8, Monash Sustainability Institute, Melbourne, Australia.

Ison, R.L., Bruce, C., Carberry, P.S., Maru, Y., McMillan, L., Pengelly, B.C., Sparrow, A., Stirzaker, R., and Wallis, P.J. 2012. A 'learning system design' for more effective agricultural research for development. Proc. European Farming Systems Research Conference, Aarhus, Denmark July 1-4.

Jiggins, J. ed. 2012. Diagnosing the scope for innovation: linking smallholder practices and institutional context, NJAS, 60-63: 1-121.

Jones, M. 2011. Innovation systems & learning networks: Linking global & local challenges Need for capacity strengthening. Programme Farewell Seminar, Jon Daane – 26 Jan 2011 Making rural innovation work: Strengthening dynamic learning networks, Wageningen, The Netherlands (Accessed: <http://www.icra-edu.org/page.cfm?pageid=publicenglishseminar2011-1> 16th December, 2013)

Koestler, Arthur 1967. *The ghost in the machine*, Penguin, London

Koestler, Arthur 1978. *Janus: A summing up*, Hutchinson, U.K.

Mbabu, Adiel N. and Hall, A. (Eds.) 2012. *Capacity Building for Agricultural Research for Development: Lessons from Practice in Papua New Guinea*. 274pp. United Nations University-Maastricht Economic and Social Research Institute on Innovation and Technology (UNU-MERIT), Maastricht: The Netherlands.

Nederlof, S., Wongtschowski, M. and van der Lee, F. 2011. *Putting Heads Together. Agricultural Innovation Platforms in Practice*. Bulletin 396, KIT Publishers.

North, D., 1990. *Institutions, institutional change and economic performance*. Cambridge University Press, Cambridge.

Pali, P. 2013. *Assessment of Innovation Platforms. The case of AusAID funded CORAF projects*, Nairobi, Kenya: ILRI

Sanyang, Sidi, George Muluh, Julienne Kuisseu, Jean-Baptiste Taonda, Abdoulaye Kafando, and Richard Stirzaker 2011. *Innovation platform for technology adoption (IPTA): maize value chain in Burkina Faso*. Proc. Innovations in extension and advisory services conference 2011, Nairobi, November – see [http://www.nepad.org/system/files/\\_extension%20conference%20programme2011.pdf](http://www.nepad.org/system/files/_extension%20conference%20programme2011.pdf) Accessed 1st March 2012.

Schön, D.A., Rein, M., 1984. *Frame reflection: Toward the resolution of intractable policy controversies*. Basic Books, New York, 247 p.

Sumberg, J. Irving, R., Adams, E., Thompson, J. 2013. *Success-making and success stories: Agronomic research in the spotlight*, In Sumberg, J and Thompson J. eds. *Contested Agronomy Agricultural Research in a Changing World*, Earthscan, London.

Stirzaker, R. 2013 *What is IAR4D? Annex 3*. In Ison et al. 2013b.