MID-TERM EVALUATION OF THE CSIRO-AFRICA FOOD SECURITY PARTNERHIPS

REPORT 1: THE CSIRO-CORAF/WECARD PARTNERSHIP

2 Jan 2013[1]

Report prepared for AusAID by a Review Team

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[1] Draft report submitted to AusAID 3 Aug 2012, comments received from AusAID 17 Dec 2012

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EXECUTIVE SUMMARY

This report presents the findings of a mid-term review of the CSIRO-CORAF/WECARD Partnership that was conducted in June–July 2012 and is part of an overall review of the CSIRO African Partnerships, which will be completed by October 2012. The purpose of this review is to **report on progress** towards program implementation, make detailed **recommendations to improve the overall quality** of the CSIRO African Partnerships and **develop options to guide the design of a second phase of AusAID support** to 2015-16.

In West Africa the Partnership has been underway for approximately 18 months. During this time CSIRO and CORAF/WECARD have made good progress in establishing the Partnership's institutional arrangements and commencing activities. This has resulted in six projects: an animal health project investigating tick control; a seed project investigating the acceleration of improved variety adoption; and a cluster of four farming systems projects investigating productivity enhancement through systems intensification. All projects have adopted an Integrated Agricultural Research for Development (IAR4D) approach, which seeks to improve impact and strengthen the capacity of research for development.

Partnership Performance

The review finds that the CSIRO–CORAF/WECARD Partnership has many merits. It is targeting critical dimensions of agricultural productivity and food security in a region where these are of the highest priority. It has mobilised high quality scientific expertise from CSIRO and has raised the profile of Australia in the region. It is working within the structures and systems of CORAF/WECARD and its strategic and operational plans and has explicit ambitions to support CORAF/WECARD to discharge its responsibilities in the region. These responsibilities include the transformation of agricultural research practice in the region as a way of improving productivity and food security. A high quality relationship has developed between the two organisations. CORAF/WECARD is particularly appreciative of the bi-modal support (research projects plus institutional development support to CORAF/WECARD) that is being provided by AusAID through CSIRO.

The review also finds that the Partnership faces challenges, particularly the program logic linking Partnership activities to CORAF/WECARD results areas. This has led to ambiguity in terms of the role and form that projects should take in order to achieve the Partnership's objective of helping CORAF discharge its responsibilities.

Part of this challenge also concerns difficulties in successfully operationalising IAR4D. This partially arises from levels of expertise on IAR4D in the Partnership. It is also because its capacity building function beyond that of a research tool has not been fully appreciated within the Partnership. In looking at the overall performance of the Partnership, the review's opinion is that progress in developing and using an IAR4D approach is of critical importance because it is a way of transforming projects into vehicles that can address the wider expectations of the Partnership and of CORAF/WECARD itself.

These challenges manifest themselves in the projects where the use of IAR4D has not progressed sufficiently to develop impact pathways that will yield results in the near term. The projects also indicate that the research focus has not expanded sufficiently to address institutional and policy issues associated with agricultural production. This is reflected in the patterns of research expertise that are being deployed by both CSIRO and the African NARS partners.

The review team concludes there are clearly challenges in the current performance of the Partnership and it will need significant modification if desired impacts are to be achieved. However, the review also finds that there are compelling reasons why the Partnership should proceed and undertake these modifications.

- This mode of research support has the potential to leave behind lasting impacts in the region both in terms of improved research for development capacity[2] as well as productivity and food security impact results — and all this from a relatively modest investment by Australia.
- The Partnership mode of research clearly requires a steep learning curve for both CSIRO and CORAF/WECARD. However, the Review Team believes that the potential value added of the approach outweighs the administrative ease of more conventional forms of research project funding.
- In a region with diverse development trajectories the food security goals of the program are highly relevant as these invite solutions that work for both economies that are intensifying for growth or intensifying to reduce vulnerability.
- The establishment phase has led to the creation of a genuine Partnership backed by strong relationships, committed to achieving their objective. The partners share the diagnosis of the review and have actively sought advice from the review team on how to address these. This coincides with the planning cycle of CORAF/WECARD and bodes well for the revision process that the review recommends.
- The existing projects offer the prospect of impacts at various levels within a realistic time frame, some within phase two and others beyond phase two.

Recommendations
The review recommends the Partnership revisits and further develops its program logic in West Africa and reorients its projects based on the resulting stronger theory of change for the West Africa Partnership. In the process of revisiting the program, CSIRO and CORAF/WECARD need to address the following:

i. Refine program and project logics and clarify different impact pathways
ii. Develop a project portfolio with diversified impact pathways
iii. Strengthen the focus on enabling learning on use of research for development
iv. Revisit the spread of projects and modes of scientific support and coordination
v. Expand the scope of expertise provided by the program

- Social science support of projects.
- IAR4D expertise
- Gender and environment expertise.
- Knowledge management and innovation communication

vi. Bring in additional expertise to address institutional development
(considered as a way of better accessing the other types of expertise mentioned above)

Guidance on the CSIRO revision process
To guide discussions on the revision of the program, in addition to the recommendations above, the review team has developed two schematic tools. The first tool is a framework to help use IAR4D to better frame projects and help identify

[2] Capacity for 1) research planning, design, and prioritisation 2) research management 3) implementing IAR4D 4) addressing policy issues 5) fostering collective action on regional issues

development objectives and impacts that can be addressed at different stages of the discovery-to-innovation trajectory. This will help some projects have shorter pathways and time frames to impact and, in doing so, provide a diversified portfolio of projects with a range of research-for-development experiences to support the IAR4D learning agenda.

The second is a scenario tool to help CSIRO, CORAF/WECARD and AusAID think through how they might balance different expectations (research, capacity building and impact) in reorienting the program (Annex 7).

Design Considerations for Phase Two of the CSIRO-Africa Partnership
The review has been asked make suggestions on the design of the next phase of the CSIRO-Africa Partnership and to suggest a process for that design. Having only reviewed one of the Partnerships it would be premature to make definitive recommendations. However, evidence collected so far suggests that the process of designing the next phase needs to take the form of a "strategic discussion" between the key stakeholders. This would focus on clarifying the theory of change for the Partnership program as a whole. This process would resemble the one that has been recommended for the West Africa Partnership, but would need to be done in a way that is nested with the overarching AusAID Africa Food Security Strategy and the stakeholders associated with that.

At this stage of the review process it is apparent that a strategic discussion will need to consider the following.

- **Aligning with the AusAID Africa Food Security Strategy**
- **Better harnessing systems approaches as a way of achieving impact**
- **Exploring collaboration between and beyond the two Partnership programs**
- **Defining a responsible exit strategy**

LIST OF ACRONYMS

AFSI	-	African Food Security Initiative
AGRA	-	Alliance for a Green Revolution in Africa
AGRHYMET	-	Centre Regional de Formation et d'Application en Agrométéorologie et Hydrologie Opérationnelle
APESS	-	Association for the Promotion of Livestock Breeding in the Savanna region and in the Sahel
AU	-	African Union
AusAID	-	Australian Agency for International Development
BecA	-	Biosciences eastern and central Africa
CAADP	-	The Comprehensive Africa Agriculture Development Programme
CIRAD	-	Centre de coopération internationale en recherche agronomique pour le développement
CGIAR	-	Consultative Group on International Agricultural Research
CIRAD	-	Centre de coopération internationale en recherche agronomique pour le développement
CIRDES	-	Centre International de Recherche-Developpement Sur l'Elevage en Zone Subhumide
CORAF/WECARD	-	West and Central African Council for African Research and Development
CSIR	-	Council for Scientific and Industrial Research
CSIRO	-	Commonwealth Scientific and Industrial Research Organisation
DFAT	-	Department of Foreign Affairs and Trade (Australia)
DFID	-	Department for International Development, UK
DONATA	-	Dissemination of New Agricultural Technologies in Africa
ECOWAS	-	Economic Community of West African States
ECOWAP	-	ECOWAS Agricultural Policy
EMF	-	Environmental Management Framework

FAAP	-	Framework for African Agricultural Productivity
FARA	-	Forum for Agricultural Research in Africa
IAR4D	-	Integrated Agricultural Research for Development
ICRAF	-	International Centre for Research in Agroforestry (also known as World Forestry Centre)
ICRISAT	-	International Crops Research Institute for the Semi-Arid Tropics
IER	-	L'Institut d'Economie Rurale, Mali
IFDC	-	International Fertiliser development Center
IITA	-	International Institute of Tropical Agriculture
ILRI	-	International Livestock Research Institute
INERA	-	Institut del l/Environnement et de Recherches Agricoles, Burkina Faso
INRAN	-	Institut National de la Recherche Agronomique du Niger
M&E	-	Monitoring and Evaluation
NARS	-	National Agricultural Research System
NEPAD	-	New Partnership for Africa's Development
NGO	-	Non-Governmental Organisation
NRM	-	Natural Resource Management
OECD-DAC	-	Organisation for Economic Cooperation and Development – Development Assistance Committee
RPG	-	Regional Public Good
TOR	-	Terms of Reference
UK	-	United Kingdom
UN	-	United Nations
USAID	-	United States Agency for International Development
WECATiC	-	Integrated Management of Tick and Emerging Tick-Borne Diseases in West and Central Africa

1. Introduction

As part of AusAID's four-year African Food Security Initiative (AFSI), Australia is funding the A$16.9m[3] CSIRO Partnership with the West and Central African Council for Research and Development (CORAF/WECARD) and the A$10m CSIRO Partnership with Biosciences Eastern and Central Africa (BecA). The initiative runs from 2010 to 2013 and aims to lift food security and agricultural productivity in Africa through joint research — working with and building the capacity of African agricultural organisations.

This report presents the findings of a mid-term review of the CSIRO-CORAF/WECARD Partnership. It was conducted in June - July 2012 and is part of an overall review of the CSIRO African Partnerships, which will be completed by October 2012. A mid-term review of the CSIRO-BecA Partnership will take place in September 2012 and will be reported separately. An overall review report will be prepared based on these two partnership reviews.

1.1 Review Purpose and Objectives

The terms of reference for this review (see Annex 1) request that this mid-term review **report on progress** towards program implementation, make detailed **recommendations to improve the overall quality** of the CSIRO African Partnerships, **develop options to guide the design of a second phase of AusAID support** to 2015-16 and suggest strategies for how the program might be scaled back or concluded post 2015-16.

The context for this review is AusAID's proposed consolidation of its food security program and an increased focus on managing for results. The Africa food security team needs to both appraise progress of its activities, and map future directions for the program. The review will be immediately useful to the following stakeholders:

- AusAID senior management
- AusAID and CSIRO desk officers
- CORAF/WECARD program and project managers

Specifically the terms of reference state that the review will:

> "provide an assessment of how well the CSIRO partnerships have been carried out to date, based on evaluation of the performance and progress of the research projects, engagement in capacity building with African partners and constraints or issues encountered in implementation."
>
> "The overall evaluation will address whether the program logic in the design documentation is to result in higher level development outcomes. It will also provide recommendations on changes to the design of the partnership activity that can improve ability to reach the development outcomes. Further, it will develop options to guide the design and development of a second three or more year phase of Australian Government funding for the partnerships, and consider possibilities for program consolidation at the close of this second phase of funding."

[3] $15.8 from AusAID and $1m from CSIRO — $12m goes through CORAF/WECARD and the rest is managed by CSIRO.

The findings and recommendations presented in this report on the CSIRO–CORAF/WECARD Partnership do not necessarily anticipate those of the final overall review report, but are instead intermediary findings that may assume different significance once the entire CSIRO Africa Partnership has been examined.

1.2 Review Process and Approach

The review was conducted by Andy Hall (Team Leader), Steve Ashley, Howard Elliott and Ian Kershaw, with advisory support from Tristan Armstrong. The review process included six days of desk-based work reviewing documentation provided by the program and developing a review plan (see Annex 2). The review plan framed its analysis of the overall performance of the Partnership with the following definition of 'partnership':

"A relationship between individuals or groups that is characterised by mutual cooperation and responsibility for the achievement of a specified goal."

Six key dimensions of partnership thus defined were explored: program design and logic, alignment with regional strategies and other frameworks, effectiveness of partnership arrangements, quality of science and impact pathways and a cross-cutting issue of attention to gender and environmental concerns. These themes were used to develop, in collaboration with AusAID, a detailed set of questions to guide the exploration of the performance of the CSIRO Africa Partnership. (These analytical themes and the questions provided by AusAID are presented in Annex 2.)

During the period 20 June - 3 July 2012 the review team collected information in Dakar, Senegal, at the headquarters of CORAF/WECARD during a two day open format workshop with CSIRO and CORAF/WECARD senior managers and with CORAF/WECARD senior managers separately. The team also visited project field sites in Burkina Faso and Ghana. CORAF/WECARD program managers, CSIRO senior managers and scientists and some personnel from the NARS and other project partners accompanied the review team. Extensive discussions were also conducted with farmers and other project stakeholders at the field sites. Key findings and next steps for the Partnership were developed in a participatory process, including a feedback workshop with CSIRO and CORAF/WECARD senior scientists and managers. The findings were also discussed and developed through a half-day meeting with the Director of CORAF/WECARD at the end of the review process.

The review has not yet explored the donor landscape to look for complementarities and niche gaps, but this will be done before the development of the final Partnership review report.

2. Analysis

2.1 Rationale and Alignment of the Partnership

The African Food Security Initiative — the CSIRO Partnerships in West and East Africa form part of this initiative — was designed around a number of key principles:

- Alignment with the Comprehensive Africa Agriculture Development Programme (CAADP)
- Ensuring that any Australian contribution demonstrate a clear Australian value addition
- Investing in activities that generate recognition and a positive profile (particularly among African leaders)

- Ensuring strong African ownership

In West Africa the CSIRO-CORAF/WECARD Partnership (hereafter 'the Partnership') is based on the following diagnosis:

"The sub-humid to semi-arid zone of West Africa is one which is predicted to be severely challenged by climate change. Innovative adaptation strategies are urgently required to enable farmers to attain food security and improved livelihoods through transition to more livestock production and use of more water-efficient options in crop production." (CSIRO-CORAF/WECARD Design Document, page 6).

The rationale for the value addition of a partnership as a means of addressing this regional challenge is premised on the complementarity of skills and mandates of the two organisations in the Partnership. CORAF/WECARD is mandated by the Economic Community of West African States (ECOWAS) and the Forum for Agricultural Research in Africa (FARA) to coordinate the implementation of CAADP Pillar IV (agricultural research, technology dissemination and adoption) in West and Central Africa.

CSIRO and other Australian research agencies are world leaders in farming systems research in semi-arid tropical environments with highly variable rainfall — sharing many similarities to conditions in the CORAF/WECARD region. The design of the Partnership anticipated that "this expertise will not only be employed in projects that are undertaken under this Partnership, but the Partnership will bring stronger systems thinking to CORAF/WECARD and its partner NARS and will undoubtedly influence the research programs undertaken through other donors."

The review notes that the design of the Partnership is well aligned both with CAADP Pillar IV as well as with the strategic plan of CORAF/WECARD that is designed to address this. The rationale for the Partnership is strong and there is a good fit between the expertise of CSIRO and the mandate of CORAF/WECARD. This design is also in accord with the definition of a partnership (see previous page) in that it specifies a goal that the partners agreed to collaborate toward and took responsibility for achieving. This is stated as "assisting CORAF/WECARD to more effectively discharge its responsibility to drive improved agricultural research in West and Central Africa".

The design describes the strategies that the Partnership would use. In addition to alignment with CORAF/WECARD's systems and institutional arrangements, these strategies involve a combination of research and technology development, capacity building and institutional development "across the research for development value chain" and ensuring activities have impact ("make a difference") at "national and institutional scale".

It is indicated that part of these strategies was the use of an Integrated Agricultural Research for Development (IAR4D) approach. The elements of this approach are described as "engagement and partnership with a full range of stakeholders, targeting change and adoption of new practices at various scales from on-farm to policy, and an embedded capacity building and learning focus for all stakeholders". The IAR4D approach is a key element of CORAF/WECARD's strategic plan and its aim of transforming how agricultural research is conducted in West and Central Africa.

The review team finds that this adoption of IAR4D as a way of combining research, capacity building and impact in projects and allied activities is strongly aligned with the overall objective of the Partnership to "assist CORAF/WECARD to more

effectively discharge its responsibility to drive improved agricultural research in West and Central Africa". The Partnership's ability to operationalise IAR4D effectively is a major focus of this review because it is a central design feature that is being deployed to achieve this objective through improving the effectiveness of research practice, improving impact (at different scales) and to drive capacity building.

2.2 Program Logic

The intervention logic for the Partnership is presented on pages 11 to 14 of the Program Project Document and in a slightly modified form on pages 4 and 6 of the Annual Program Report up to May 2012.

The 'overall purpose' of the Partnership, as stated in the Program Document (p11) is:

> 'to assist CORAF/WECARD to more effectively discharge its responsibility to drive improved agricultural research in West and Central Africa.'

The Partnership M&E plan (May 2012) provides a measure of success that is different but potentially consistent with the overall purpose, in that:

> 'The Partnership will be judged as successful if relevant, good quality research is being conducted in accordance with the IAR4D approach, in a range of countries and addressing a range of priority research questions, with inputs from both African and Australian researchers."

Figure 2 (see Annex 8) in both source documents maps the Partnership Activity Areas against CORAF/WECARD Strategic Plan Result areas to demonstrate how the Partnership nests within the CORAF/WECARD institutional logframe. In the view of the review team this is an excellent way of organising external support to ensure both relevance and harmonisation and to avoid the negative effects of excessive 'projectisation' associated with different development partners within the overall function of the organisation.

However, there is an issue with the presentation of this intervention logic, which, in the view of the review team, is the primary driver of a number of ambiguities within the current Partnership and its functions.

The key strength of the CORAF/WECARD logframe is that it is organised to express cause-effect relationships such that it is clear that if we do (a) then (b) will be the expected product. However, the Partnership intervention logic does not follow this structure. While it is good and helpful at the level of Activity Areas, it does not clearly state the objective to which these Activity Areas contribute, other than by asserting that it will 'contribute to CORAF/WECARD Results', while also 'contributing to the CORAF/WECARD Specific Objective and target Results'.

Thus, the flow of intervention logic is not clearly stated:

- If we complete the Activity Areas, what do we expect to achieve?

Or in other words:

- Why are we doing what we are doing?

At first glance this may seem like a minor quibble over intentions, especially if we take the previously stated overall purpose of the Partnership as being to assist CORAF/WECARD to more effectively discharge its responsibility. However, in practice we observe that the actors within the Partnership do not have a shared understanding of what the Partnership is actually trying to achieve. Possible alternative answers, as expressed to the review team, include:

- Supporting CORAF/WECARD to be more effective at facilitating the transformations required for sub-region-wide impact, through a combination of; a) excellent IAR4D-based research; b) associated improvements to research capacities of multi-country teams; and c) systemic enhancements to clear impact pathways from CORAF/WECARD work (the implication of the stated Partnership purpose and the Partnership design)
- Conducting research within CORAF/WECARD systems while providing incremental support to some CORAF/WECARD systems (the current situation)
- Conducting interesting biophysical research using local farmer groups (as seen in some Partnership projects)
- Applying Australian expertise in systems research to research projects in West Africa (the perspective of some in AusAID)
- Delivering impacts on food security through the uptake of Partnership research products into national systems (the perspective of others in AusAID)

Achieving any of these objectives effectively would require systems, managers, scientists, research teams, inputs, and activities to be aligned as necessary to achieve the objective. However, crucially, the nature of such alignments, organisations and timeframes would be different depending on which objective is being sought. Consequently we see that this uncertainty over the fundamental reason for the Partnership leads to an ambiguity of direction among people working within the Partnership. And, in practice, we see different elements of the Partnership aligning behind different choices from among these possible objectives, which weakens the focus and effectiveness of CSIRO's engagement.

In particular the design document is unclear on the balance and even sequencing of institutional strengthening, development objectives and the implementation of research projects along the strategic-to-adaptive continuum. As a result there is no clear theory of change against which progress might be monitored.

The end result is that the Partnership is not clearly designed (at present) to help CORAF/WECARD deliver on its mandate, despite the Partnership's stated purpose of doing so.

2.3 Project Logic

The intervention logic of the six projects supported by the Partnership is summarised in project logframes, which — to ensure consistency and alignment — should be nested into the wider CORAF/WECARD Strategic and Operational Plan logframes.

All partnership projects were designed according to existing CORAF/WECARD processes, a key feature of the effort by CSIRO to work within the organisation and avoid parallel systems. The quality of design of the project portfolio varies

significantly for the four project logframes analysed[4]. While collectively the project logframes provide the general impression of difficulty in developing good logframes — and none is devoid of potential improvements — the following specific issues can be observed in at least one of the Partnership project logframes:

- Use of different formats between projects, which makes nesting within the wider CORAF/WECARD Strategic Plan difficult
- Errors in logframe use, such as non-unpacking of cause-effect relationships, indicating lack of clarity on theories of change
- Weaknesses in mapping out the scale of expected impacts
- Overly-ambitious project expected impacts given the context of working on sub-regional programs
- Unclear impact pathways beyond project participants
- Assumptions inadequate to justify intervention logic
- Weak measures for stakeholder capacity strengthening proposed
- Project indicators that frequently reflect these weaknesses

2.4 Monitoring and Evaluation

The Partnership has its own M&E plan that was finalised during the 2012 Annual Review workshop in May 2012. It is recognised that good donor practice would avoid parallel systems and so the Partnership M&E system aims to utilise as much of CORAF/WECARD's existing M&E system as possible. The M&E system monitors at four key levels:

- CORAF/WECARD Specific Objective and Results
- AusAID headline results
- The quality of the Partnership, and
- Partnership projects

The M&E plan is clear on the expected time horizon for project impacts:

> 'Research projects will take at least two to three years to complete even the most applied research, meaning that on-the-ground impact will be achieved largely after the life of this Partnership design.' (p8)

As noted above the intervention logic for most if not all Partnership projects leaves room for improvement, often in very important ways such as in the expected scale of impacts, pathways to impact, and the time frame for this. Consequently it is common for the project logframe indicators to also fail to capture these issues effectively.

The review team believes that primarily the Partnership is suffering from weaknesses in planning rather than in M&E and the choice of indicators. The implication is the need for a sequential revisiting of program design with intervention logic first, followed by compatible re-visiting of indicators for M&E.

2.5 Effectiveness of Institutional Arrangements of the Partnership

2.5.1 Establishment of the Partnership

[4] Full logframes for the Cer-live-trees and WECATIC projects were not seen by the Review Team.

The Partnership has been underway for approximately 18 months. During this time CSIRO and CORAF/WECARD have made good progress in establishing the Partnership's institutional arrangements and commencing activities. A Partnership Management Committee has been established as the key governance structure. In line with CORAF/WECARD's priorities and strategic plan, a research gap was identified that the Partnership could address — dryland farming systems — and a process of project selection was developed that used a combination of competitive tendering and commissioning.

CSIRO and CORAF/WECARD participated jointly in the project proposal evaluation and selection process through membership of CORAF/WECARD's Technical Advisory Committee. Six projects were selected: an animal health project investigating tick control; a seed project investigating the acceleration of improved variety adoption; and a cluster of four farming systems project investigating productivity enhancement through systems intensification. All projects have adopted an Integrated Agricultural Research for Development (IAR4D) approach and have been active for between 9 and 15 months. A review of these projects is presented in section 2.7, with further detail provided in Annex 7.

2.5.2 Quality of Relationship between Partners

The review finds evidence to suggest a strong partnership between CSIRO and CORAF/WECARD. The Partnership is characterised by a high degree of mutual respect. CORAF/WECARD has been particularly appreciative of CSIRO's willingness to align with its priorities and institutional arrangements, as well as the professionalism, expertise and commitment exhibited by CSIRO scientists in their engagement in the Partnership and its individual projects. CORAF/WECARD also highlighted the uniqueness of the bi-modal support that has been provided by Australia — technical support and collaboration at the project level but also support in institutional development and capacity building of CORAF/WECARD and its NARS partners. CORAF/WECARD sees this bimodal arrangement as almost unique and a model for other donors and scientific partners.

This review observes that CSIRO scientists have worked constructively with their counterparts to explore how best their expertise can be integrated into the projects in a supportive way. CSIRO's senior scientists are accustomed to leading research projects and programs, but have been willing to step back and take supportive, mentoring roles in these projects in order to ensure that they remain led by and owned by their local partners. This has been widely appreciated by NARS project scientists and others as well as by CORAF/WECARD. This has been reinforced by formal capacity building exercises conducted by CSIRO scientists — for example, on aspects of biophysical modeling.

CSIRO for its part has been highly appreciative of the opportunity to expand its scientific horizons in the agro-ecologies of West Africa and has enthusiastically embraced the intellectual challenge of the IAR4D approach.

CORAF/WECARD now regards AusAID as one of its leading donors and would like to see AusAID take a more active role in the Governing Board. CORAF/WECARD judges that CSIRO and AusAID understand the organisation's mandate and goals and would like Australia's voice heard in its interactions with other donors.

2.5.3 Scope of Activities Addressed by the Partnership

As discussed in Section 2.2 the underdeveloped program logic of the Partnership has led to a lack of clarity about the role of the projects in delivering the Partnership's objective of "assisting CORAF/WECARD to discharge its responsibility". As a result

the scope of activities, particularly in terms of the projects, is too narrow to fulfill this ambition**.** A stronger program logic would have revealed that projects need to deliver impact through Regional Public Goods (RPGs) that are both technical in nature (improved production techniques and associated development, market and policy strategies) as well as capacity building RPGs that improve the effectiveness of agricultural research and innovation processes (inter alia, lessons and learning on how to better use research for impact).

The review finds that the Partnership has given less attention to this second type of RPG. The idea of projects as vehicles for transformation has been underplayed and it is, consequently, not part of the common narrative used by scientists to discuss their progress and achievements. The review notes, for example:

- Projects have a strong technical, biophysical focus, but are less well set up for understanding how biophysical expertise can be used more effectively to address national and regional scale issues.
- Projects are not yet addressing 'policy' or regional public goods and are not structured to do so.
- A policy project looking at the research process is being conducted by CSIRO but this is external to the CORAF/WECARD Partnership.

This suggests that there are some as yet unfinished discussions and negotiations needed between the partners on finding ways that the Partnership can achieve its objective of helping CORAF/WECARD "discharge its responsibility" in the region.

2.5.4 Mechanisms to Address Gender and Environmental Concerns

Gender

An analysis of gender mainstreaming is presented in Annex 4. At the time the CSIRO-CORAF/WECARD Partnership was initiated, CORAF/WECARD did not have a formal policy or strategy for integrating gender considerations into its work. With support from DFID and other partners, CORAF/WECARD developed a Gender Policy and Strategy[5] in 2010. Although the selection and design of the Australian Partnership projects commenced before these policy and strategy documents were endorsed, the two processes proceeded in parallel. The design document for the Partnership recognised these developments and committed to supporting the operationalisation of the policy, once endorsed by the CORAF/WECARD Board.

The review team finds that CORAF/WECARD and CSIRO sought to reflect some of these emerging principles and considerations into the Partnership project designs, but a more consistent or structured approach would have yielded better results.

There was an intention to undertake gender analysis for each of the Partnership projects. As yet, none of the projects have undertaken any structured analysis of how gender roles might be taken into account in the design or future implementation of the projects. The review team was not able to undertake detailed analyses of the projects' baseline surveys, but notes that any failure to take account of gender issues could risk undermining the quality of the science upon which the research is based.

Project partners reportedly aimed to seek a reasonable gender balance in the research teams. This, however, has proven difficult to achieve. Only three of the 17 CSIRO research scientists involved in the program are female and this includes none

[5] *Gender Policy and Strategy of CORAF/WECARD*, November 2010

of the senior scientists. All the CORAF/WECARD scientists involved are male. Some projects do include women scientists in leadership positions, but all of these are from national level research partners. On this measure, neither CORAF/WECARD nor CSIRO have demonstrated leadership to their NARS partners.

Recognising that a lack of internal expertise is holding back progress on this agenda, CORAF/WECARD is currently in the process of recruiting a gender specialist to lead the implementation of the Gender Action Plan. A more concerted effort is required with respect to **both** gender analysis in research planning and gender staffing. This has also been a gap in Australia's support to the program to date.

Environment
An analysis of environmental compliance is presented in Annex 5. CORAF/WECARD has considerable experience with environmental management processes, since many of its programs are subject to the environmental safeguards assessments required by other donors — in particular, USAID and the World Bank. In essence these include much the same steps required by AusAID's environmental management system: identifying key environmental risks; assessing those risks; adjusting investment strategies to avoid high risk activities; and devising measures to manage and mitigate risks in those activities that are implemented.

In 2008, CORAF/WECARD developed its own Environmental Management Framework (EMF) to clarify its requirements. The EMF includes the following key elements:

i. **Negative list** – list of activities, or characteristics of activities, that cannot be supported
ii. **Policies** – minimum environmental management policies and standards to be incorporated, based on World Bank safeguard policy requirements. This includes strict requirements related to physical construction works, resettlement, critical natural habitats, forest developments and the use of pesticide products and genetically modified organisms
iii. **Processes and responsibilities** – description of the processes to be followed in implementing the EMF, and assignment of responsibilities for these processes
iv. **Capacity building** – training and technical assistance that will be provided to build capacity so that EMF responsibilities may be successfully fulfilled
v. **Monitoring** measures that will be taken to monitor, report and strengthen implementation of the EMF

All project proposals for funding through CORAF/WECARD must include a declaration that none of the proposed activities infringe on the requirements of the EMF. All proposals are subject to environmental screening by CORAF/WECARD before they can be submitted to the Board for approval. Where potential conflicts with the EMF arise, the proponents are required to propose mitigation measures or commission an environmental impact assessment.

A 2011 mid-term review of CORAF/WECARD's Operational Plan pointed out that the organisation's focal point for environment does not have training in environmental assessment, and recommended it be supported by external specialist expertise. This is primarily an internal management issue for CORAF/WECARD, but there may be a role for additional CSIRO support, given the organisation's deep expertise in ecological systems and environmental science.

2.5.5 Institutional Challenges that affect Partnership Performance

The review observes that there are a number of aspects of the institutional arrangements of the Partnership that have affected its performance.

CSIRO scientists only involved post-project approval. The review notes that while CSIRO scientists and senior managers were involved in the development and approval of project proposals, those that subsequently worked on projects only became involved after the project approval stage. There were good reasons for this, related to the transparency of the competitive and commissioned research process. However, this has created an ambiguous role for scientists and individual scientists' inputs are not strongly nested in strategy, nor guided by results to be achieved. The review recognises that CSIRO scientists have found research and mentoring roles that CORAF/WECARD and NARS partners appreciate. However, this ad hoc approach seems to be a sub-optimal use of CSIRO inputs. The partners need to revisit the most effective way of organising CSIRO's scientific contribution to the Partnership. This would need to be part of a wider discussion of the role of the projects in terms of CSIRO helping CORAF/WECARD discharge its responsibility in the region.

Spread of investments. In line with CORAF/WECARD procedures, the six Partnership projects all cover at least three countries and include participation of national agricultural research organisations (NARS), CGIAR centres and NGOs. One project is led by an NGO, the rest by the NARS. In the negotiation of the Partnership, CSIRO and CORAF/WECARD agreed that the maximum level of funding to individual projects needed to be increased in order to concentrate investments. The ceiling was raised from A$1 million to A$2 million. However, although this concentrated resources on a smaller number of projects, the portfolio nevertheless remains widely spread between countries, project sites and partner organisations. The projects cover ten countries in the region and include the participation of 65 organisations (with some duplication). Effective science leadership and supervision is difficult to achieve, given such a broad spread of project activities and associated heavy transaction costs on the partners, irrespective of the program's strategy and objectives.

Commissioned versus competitive project development. The Partnership has followed CORAF/WECARD's selection processes. The review team recognises the value of competitive grants for their transparency, stimulation of consortia, and positive impact on the quality of proposals presented. However, competitive grants schemes assume that there are indeed enough resources in the region to have competing teams responding to very clear calls. This is particularly challenging given the complex agenda of the Partnership's projects (research, impact and capacity development), the sorts of organisational groupings appropriate to this agenda and the prescribed IAR4D approach. If regional teams are formed to create critical mass by aggregation, competition may not leave much choice and may foster proposals that deviate from the terms of reference (TORs). The review team accepts, therefore, that commissioned proposals with very clear TORs can fill gaps in program coverage, target strategic linkages that are needed, and can come up to speed quickly.

2.6 Potential for Outcomes and Impacts of the Partnership

2.6.1 Impact Pathways

The Partnership is at too early a stage of development to be expected to demonstrate outcomes and impacts that it will lead to, although it would be expected that at least some projects would have a credible theory of change for how specific

outcomes and impacts might be achieved. As discussed earlier the development of a program and project logic of this type has been a key challenge of the Partnership. The review, therefore, examines the extent to which expected outcomes and impacts are likely to occur given the current arrangements. A useful way of doing this is to appreciate/assess how well IAR4D is being used, given that IAR4D is the Partnership's stated way of operationalising a systems perspective to achieve its intended results — one of the main design premises of the value addition of a partnership between CSIRO and CORAF/WECARD.

The review also recognises that IAR4D and its operational implications are not widely or consistently understood. So, in order to provide an assessment of how well IAR4D is being used it is important to explain what this idea implies. Annex 6 provides an overview based on existing literature and the reviewers' own experiences of the concept, emerging practice and implications of adopting this approach. The following points are worth highlighting:

The conceptual origin of IAR4D is the idea of an *innovation system* as an effective way of thinking about how change and development take place (CORAF/WECARD, 2007; Hawkins et al., 2009; Adekunle et al., 2012).

An innovation system is a framework based on observations about the way innovation takes place in successful economies and is increasingly being used as an investment planning tool for agricultural development (World Bank, 2006; 2012). It makes the following key points:

- It shifts/ expands attention away from technology as the main driver of social and economic change and instead focuses on behaviour and capacity of systems to support learning and change around specific problem sets or opportunities.
- It recognises that change/ innovation requires different types of learning — technological learning (developing and using more effective technology), organisational and institutional learning (doing things in a more effective way) and policy learning (more effective incentives, regulations and investments).
- It recognises that learning involves accumulating, accessing and assimilating information in different ways and from different sources through research and practice and through search and interaction.
- It recognises that since interaction of different information sources is so critical in supporting learning, innovation normally emerges from an architecture that looks like a network with multidirectional information flows rather than like a delivery pipeline driven by research.

These four points may sound rather esoteric, but these have very practical implications for IAR4D as an approach based on this concept. It suggests that projects need to have the following features:

Expanded scope of research and learning. Projects are both multidisciplinary (combining different skills) and interdisciplinary (combining concepts from different disciplines) in order to investigate biophysical systems and phenomena as part of the wider innovation system of institutions, markets, and policy and development processes. Projects use diagnostic tools to define systems research questions and activities and identify partners and stakeholders.

In-built impact pathways. Projects combine research and development activities through partnerships and networking to develop links to users of research, other sources of information and learning and complementary investments and activities. Projects use multi-stakeholder approaches, including innovation platforms to define and address objectives in ways that encourage wider stakeholder collaboration at different levels — farmer, research community, development community, market actors and policy-makers.

Capacity building on organising for learning. Projects and programs experiment with ways of organising learning to improve the effectiveness of using research for development. Projects and programs use research, process monitoring, knowledge management/ innovation communication and training to improve and share lessons on the effectiveness of multi-stakeholder and other approaches that support technical, organisational, institutional and policy learning.

2.6.2 How well has the partnership been able to apply these ideas?

The review notes that CSIRO, CORAF/WECARD and NARS scientists, regional coordinators and program managers have all enthusiastically embraced the intellectual challenge of adopting the IAR4D approach. CSIRO in particular welcomed the opportunity the Partnership provided to productively engage in what for it, in the words of one CSIRO program manager, was "a given in their strategic plan". However, all parties acknowledge that IAR4D has been the dimension of the Partnership that has been most challenging, least well-developed and where more efforts and expertise are required.

Project teams have had the benefit of some awareness raising on IAR4D — mainly on innovation platforms as a tool for facilitating multi-stakeholder interaction to identify constraints and opportunities and to design collective action to pursue these. The review notes that this awareness raising took place after the development and approval of the project proposals. While the review acknowledges that the projects are at an early stage of development, field visits revealed that there is limited common understanding of the operational and strategic dimensions of an IAR4D approach. This was observed to play out in a number of ways:

- Many projects have organised groups (often erroneously described as "innovation platforms") to undertake farmer participatory research with limited involvement of market, social development and policy organisations and processes required to achieve impact at scale.
- Similarly, market, institutional and policy dimensions of the research for development process have had limited attention to date. This will limit the scale of impacts achieved.
- Social scientists (including economists) are present in all projects, but are often in relatively junior positions with an insufficiently broad set of social science expertise to adequately address constraints and opportunities systemically or to develop and understand impact pathways.
- The main research focus in the NRM projects is on exploring and modeling underlying biophysical systems. In some cases projects seem to have overlooked existing bodies of research that would point to different starting points; for example, research on seed systems[6], value chains, innovation brokering, adaptive collaborative management of natural resource systems, etc.

[6] There is a separate project on seed systems that may eventually create some synergies.

- Project scientists appreciate that the program has a learning orientation because of its adoption of IAR4D, but aspects of learning how to use research for development have been under emphasised and under resourced (particularly in terms of scientific expertise brought to bear on this). This will further restrict the scale of any impacts achieved.

2.7 Project Analysis

Annex 7 presents a detailed analysis of the six projects under the Partnership, and Table 1 at the end of this sub-section provides comparisons across the portfolio. This analysis demonstrates the way the current extent of the operationalisation of IAR4D has affected the performance of the projects and how it could be used to chart out more realistic pathways to impact.

Saliency
All of the projects address salient problems facing large numbers of poor people. Four projects (called "farming systems" projects) address sustainable intensification in the face of dynamic changes in population and climate change. The issues are not new but a proper use of IAR4D principles may generate new insights and eventual innovations. For each of the farming systems projects, the review team questions the current point of entry to the problem (usually bio-physical research) and finds that projects could be made more important in terms of impact as well as relevance.

As an example of a salient project, the WECATIC project is truly regional in nature because it affects all countries under the Partnership. It involves an invasive species of tick whose presence is evident but the magnitude, spread, degree of resistance to acaracides, and best measures of control are undetermined. Its solutions are both regional and location-specific.

The seed project is also salient. However solving the "seed system problem" in West Africa has preoccupied every major donor and development agency in the region over the last four decades. The search for a localised success as pursued in the current project, working in an innovation systems framework around a defined community and commodity, may be possible but the solutions will lie in regional markets and trade in products. It involves a higher order of "innovation platform" raised to the ECOWAS level.

Quality of Research
The review team has used the term quality of research rather than quality of science to highlight the importance of IAR4D. We assume that scientific methods are up-to-date and appropriate for the task. As noted earlier, the appropriateness of the task is a question of program logic.

The mixture of competitive and commissioned projects has resulted in the selection of the best projects from a given call. This means that they are not designed to be coherent and synergistic in methodology, data collection and sharing of lessons. The program managers and CSIRO staff may help to draw lessons *ex post* and, in the future, CORAF/WECARD can play an important role in ensuring compatibility and cross-learning across countries and across programs. It is not necessary to centralise all information exchange through CORAF/WECARD in an era of spatially distributed information, but the organisation's program managers need to be on top of the information.

The different understanding of IAR4D, and the need for training of participants, means that a certain degree of retrofitting of the concept is evident. The team has not

reviewed the data collection instruments for characterisation of the baseline situation. It can only urge that age and gender disaggregation is important and that indicators are suitably benchmarked for monitoring changes in the situation of women and youth.

None of the projects has moved into generating evidence for policy-making. It has been a concern of the donor that the research generate information and knowledge with an impact on policy-makers; that the results be relevant to and communicated in a way that influences decision-making. At this stage of the review, it is worth examining the potential for research "success" to lead to policy dialogue and changes favourable to improved food security. This may be by exploring the institutional and policy environment for the technical success to become an innovation.

Contribution to Partnership Objectives

CSIRO has entered into a partnership in which helping CORAF/WECARD fulfill its role in strengthening research is part of the bargain and not just a means to promoting food security. CSIRO's program manager for the Partnership adds value to CORAF/WECARD itself. These six projects collectively have to contribute to enhancing CORAF/WECARD's ability to strengthen research in the region. CSIRO has assisted in the selection of candidates from the region for AusAID's PhD scholarship program that supports training in Australia. These candidates are associated with Partnership projects and their contribution to strengthening science (especially in modelling system changes) will come after the conclusion of the projects. Section 2.6 describes how IAR4D can be operationalised effectively in a way that the collection of projects can a) be brought together to generate lessons on system change, and b) move closer to findings that can have an impact on policy at the national level and at the regional level when collective action is required.

Challenges and Opportunities

The challenges and opportunities for each project are discussed in Annex 7. The challenge for the Partnership portfolio is "time". In the final review team discussions with CORAF/WECARD and CSIRO leaders, there was shared interest in engaging in a strategic conversation about the rebalancing of the portfolio. CORAF/WECARD and CSIRO would re-examine each project for its "innovation trajectory"; i.e., where is it now and how long will it take for "success in research" to become a "near innovation". This was deemed necessary to respond to the donor's need to show the prospect of food security impacts.

Table 1: Partnership Portfolio Projects Compared

Project	Seed Systems	WECATIC	CerLiveTrees	APESS	Ecological Intensification	Crops / Small Ruminants
Importance of Problem	Unresolved	Emerging	Continuing	Evolving with Climate Change	Continuing	Evolving with population
Potential for innovation	Low	Med-High	Med	Med	Low-Med	Medium
Approaches (1)	Mother-Baby Trials	Identify tick spread (Bm), control practices	Modeling optional systems	Focus on biomass as lever	Conservation practices, manure	Dual purpose legumes

Approaches (2)	Crop models	Implement range of solutions	Testing systems	Regeneration of land, Value Chains, and Markets	Modelling options	Modelling soil water and nitrates
Entry Point	Narrow	Diagnosis of spread, systemic issue	Baseline data, survey	Biomass, with markets in mind	Practices, Community organization	Dual purpose legumes
Potential impact	Local	Region-wide	Local options, Regional application of model	Basically local	Local impact, Lessons for researchers	Local for fodder, Long term for soil water and nitrate
Policy involvement	Not engaged	Implications for Regional Collective Action	Move predictions into policy arena	APESS connected to high levels ECOWAS, UN	Implications for social relations	Limited implications, Community Action
International collaboration (Asterisk indicates potential)	ICRISAT	France*, Belgium*, Switzerland*	ICRAF, ICRISAT, ILRI	ILRI, AGRHYMET. ISS, CEDC	CIRAD, ILRI	ILRI, IITA, ITC

2.8 Partnership Gaps and Opportunities

The review also notes a number of wider institutional issues that affect the ability of the Partnership to use IAR4D to define and operationalise impact pathways.

IAR4D uptake pathways in CORAF/WECARD. A recent review of the implementation of the 2007 - 2011 CORAF/WECARD operational plan notes that the organisation's program managers have different understandings of what an IAR4D approach involves. CORAF/WECARD is mandated to use lessons on IAR4D, including those from the Partnership, to promote a new paradigm of research in the NARS in the region. CORAF/WECARD is characteristically candid in its recognition that it has yet to find an effective way of achieving this in its current organisational structure — although initial attempts have been made through the DONATA project (pers. com. Sidi Sanyang). A fundamental issue here is that CORAF/WECARD program managers could have a valuable role in accumulating, synthesising and promoting such lessons as regional public goods. Unfortunately, their role is viewed more as scientific coordination and oversight. In reality, program managers play a mainly administrative function due to the high level of commitments they have across a large number of CORAF/WECARD programs funded by different donors.

Knowledge management and innovation communication. CSIRO and CORAF/WECARD both acknowledge that communication and knowledge management within the Partnership and within CORAF/WECARD need to be strengthened considerably. This needs to expand beyond a current focus on public relations and assume a wider role in supporting innovation and impact. Often referred to as communication for innovation (Leeuwis and Aarts, 2011) this includes dissemination of findings and lessons, advocacy (particularly at the policy level), facilitation and negotiation of change, conflict resolution and brokering. This implies new skills in both projects and the CORAF/WECARD secretariat.

2.8.1 Value of the Partnership from a Regional Perspective

AusAID has taken on a difficult challenge (food security) in a difficult region (characterised by small countries with major problems of sustainable livelihoods). There are risks because there is a heightened prospect that economic growth is ;/marred by of political uncertainty. For this reason, the review team believes that the region is at a point of inflection: the economic growth and political stability trajectory could turn upwards, or, with some exogenous events turn downwards. In either event, a strategic CSIRO-CORAF/WECARD Partnership program can have positive impacts on food security.

The CSIRO-CORAF/WECARD Partnership has good potential in this challenging context. First, by working through a regional program it has the potential to address the collective dimension of the deep vulnerability of the Sahel region. Second, regional research programs are able to continue activities during national upheavals (and often provide soft landings that keep refugee scientists in the region). Third, the food security goals of the program invite solutions that work for economies that are intensifying for growth or intensifying to reduce vulnerability.

3. Overall Assessment of Partnership Performance and its Challenges

The CSIRO–CORAF/WECARD Partnership has many merits. It is targeting critical dimensions of agricultural productivity and food security in a region where these are of the highest priority. It has mobilised high quality scientific expertise from CSIRO and has raised the profile of Australia in the region. It is working within the structures and systems of CORAF/WECARD and its strategic and operational plans and has explicit ambitions to support CORAF/WECARD to discharge its responsibilities in the region. These responsibilities include the transformation of agricultural research practice in the region as a way of improving productivity and food security.

This approach of working through CORAF/WECARD and the provision of what the Partnership refers to as bi-modal support (research projects plus institutional development support to CORAF/WECARD) is a model of good practice. This is a value-adding form of scientific collaboration that is appreciated by CORAF/WECARD and that has a high potential to strengthen the capacity of research for impact in the region.

It is also, however, important to recognise that working in this way is extremely challenging for all those involved. It implies: a new role for CSIRO scientists, mentoring others rather than leading research; pathways to large-scale impact are not directly under the control of individual projects, but through the wider endeavours and capacities of CORAF/WECARD and its partners; that research projects need to assume a multi-dimensional role, becoming vehicles for technology development and promotion, capacity building and policy and institutional development; the need for specific focus on strengthening CORAF/WECARD as an organisation to complement the research project focus, and this may also imply different skills as compared with conventional research collaboration; and that, in the time scale of the first phase of the Partnership, even in the best case scenario, many impacts are going to be of an intermediary nature, such as new technology and capacity development.

A key finding of this review is that these challenges were not sufficiently appreciated in the design of the Partnership — particularly the program logic linking Partnership activities to CORAF/WECARD results areas. This has led to ambiguity in terms of the

role and form that projects should take — as conventional research or as projects to address the wider organisational responsibilities of CORAF. It has also led to unrealistic expectations of what the Partnership can achieve in its lifespan. These expectations have been expressed to the review team by different stakeholders and span the following range: opportunities for high quality research; contributions to CORAF/WECARD's regional responsibilities, and; AusAID's desire for rapid impact results.

The ambiguity of purpose plays out in the projects. These are predominantly tackling issues of technology development and promotion at the community level: both important and both CORAF/WECARD results areas. However, the projects were seen to be paying less attention to policy and institutional development issues, including those that relate to improving the performance of agricultural research organisations in the region, and also, crucially, but also crucially to future service delivery at any scale as envisaged by IAR4D. This weakens the Partnership's potential for large-scale impact.

That is not to say that the Partnership had not targeted these aspects of policy and institutional development in its design. Rather, the problem is that the proposed approach for tackling these issues — IAR4D — has not been successfully operationalised. This partially arises from levels of expertise on IAR4D in the Partnership. It is also because its strategic function beyond that of a research tool has not been fully understood within the Partnership, particularly its potential role in helping CORAF/WECARD deliver on its wider responsibilities of driving the transformation of agricultural research practice in the region. In looking at the overall performance of the Partnership, the review's opinion is that progress in developing and using an IAR4D approach is of critical importance because it is a way of transforming projects into vehicles that can address the wider expectations of the Partnership and of CORAF/WECARD itself. It has the potential to do this in three ways:

- **Quality of research.** An IAR4D approach improves the quality of research by expanding the scope of investigation beyond biophysical systems to explore the wider innovation system of institutions, markets, and policy and development processes.
- **Impact results.** An IAR4D approach improves short and long-term impacts by developing links to users of research and complementary investments and activities as part of the research process and encourages learning and information sharing between research and this wider set of players.
- **Performance of research and development organisations.** An IAR4D approach improves the effectiveness of the research and development process through an explicit agenda to support learning about how to organise for innovation and impact.

Currently the Partnership's projects have not been able to make use of IAR4D in this way and most lack the expertise to do so.

The review team concludes there are clearly challenges in the current performance of the Partnership and it will need significant modification if desired impacts are to be achieved. These changes focus mainly on strengthening the program logic and subsequent re-orientation of Partnership support, better framing of the projects and the Partnership as a whole with IAR4D, and bringing additional expertise and partners to address a number of areas related to this.

There are a number of compelling reasons why the review team believes that the Partnership should proceed into a second phase, albeit in a substantially modified form. These reasons include:

- This mode of research support has the potential to leave behind lasting impacts in the region both in terms of improved research for development capacity[7], as well as productivity and food security impact results — and from a relatively modest investment by Australia.
- The Partnership mode of research clearly requires a steep learning curve for both CSIRO and CORAF/WECARD. However, the review team believes that the potential value added of the approach outweighs the administrative ease of more conventional forms of research project funding.
- In a region with diverse development trajectories the food security goals of the program are highly relevant as these invite solutions that work for both economies that are intensifying for growth or intensifying to reduce vulnerability.
- The establishment phase has lead to the creation of a genuine partnership backed by strong relationships, committed to achieving the shared objective. The partners share the diagnosis of the review and have actively sought advice from the review team on how to address the program weaknesses. This coincides with the planning cycle of CORAF/WECARD and bodes well for the revision process that the review recommends.
- The existing projects offer the prospect of impacts at various levels within a realistic time frame, some within a phase two and others beyond phase two.

The key recommendations of the review and ways that the Partnership should address these are presented in the next section.

4. Recommendations and Ways Forward for the End of Phase One and Phase Two (2012-2016)

4.1 Key recommendations

Rather than prescribe exactly how the program should be restructured, the review team has discussed with CSIRO and CORAF/WECARD a process through which they can revisit the program. This process can commence immediately to reshape the program for the remainder of this current phase. These immediate adjustments will need to be carefully coordinated with the design of the next phase of the Partnership, as some of the changes may not take effect until after mid-2013, when the current phase ends.

The review team recommends that in the process of revisiting the program, CSIRO and CORAF/WECARD need to address the following:

i. Refine program and project logics and clarify different impact pathways
The review team has discussed and agreed with CSIRO and CORAF/WECARD senior managers that revision of the program and its projects should begin with improving the program logic and clarifying program objectives. This revised logic should be clearer about how it will align with the Partnership's purpose of helping CORAF/WECARD discharge its responsibilities in the region and may involve

[7] Capacity for 1) research planning, design, and prioritisation, 2) research management, 3) implementing IAR4D, 4) addressing policy issues, 5) fostering collective action on regional issues

identifying wider CORAF/WECARD institutional development issues that need to be addressed as part of the Partnership. This will provide a stronger foundation for reformulation of the research projects and other activities, and provide a clear focus for the management of CSIRO inputs. A revised approach to M&E can then be devised to track progress and record results and that strikes a better balance between learning and accountability.

ii. Develop a project portfolio with diversified impact pathways

Develop a better balance between short and long-term impact pathways in the project portfolio with at least some projects delivering impact within the Partnership time frame. This will require a careful analysis of existing projects, the identification of key development objectives that can be realistically achieved and the identification of champions and new partners who can mobilise research and development activities through market, social development and/or policy processes. An analysis of the current projects (see Annex 7) provides a commentary on the projects that may assist with this. A more consistent application of the IAR4D approach will be critical to the revisions required and will need to be complemented by wider institutional developments in CORAF/WECARD needed to operationalise this approach. Exploring collaboration with both research and development-orientated programs (including other programs supported under AusAID's Africa Food Security Initiative) as a way of leveraging resources, accessing expertise and achieving impact would be entirely consistent with an IAR4D approach.

iii. Strengthen the focus on enabling learning on use of research for development

A stronger focus is required on systematically learning how to use research for development to help CORAF/WECARD better operationalise IAR4D as a way of helping transform research practice in the region. In addition to using IAR4D more consistently in projects it may also require the Partnership to find ways of giving this theme stronger operational and organisational focus within CORAF/WECARD. Critical to this will be arrangements that allow CORAF/WECARD to better support a learning function in projects and facilitate the spread of this learning to research and development organisations in the region through networking and capacity development. Annex 6 explains the way IAR4D implies both an improved focus on impact pathways and a learning focus at both a project and innovation systems level.

iv. Revisit the spread of projects and modes of scientific support and coordination

The review team hesitates to prescribe geographic consolidation or changes to the coordination role and modus operandi of CORAF/WECARD program managers. At the same time it recognises that getting these issues right is central to the effectiveness of the program in the future. Clearer program and project logics should provide the basis for realigning both projects themselves and CSIRO support to those projects and to CORAF/WECARD more generally. Among several directions this realignment might take is the geographic consolidation of the project portfolio, a reallocation of scientific resources to specific projects or project sites, or a revision of the number or range of partners.

v. Expand the scope of expertise provided by the program

Both CSIRO and CORAF/WECARD acknowledge some gaps in the expertise that the Partnership brings to bear on the projects and the program as a whole and this is likely to be a continuing feature of the reconfigured program in the future. Key areas are as follows:

- Social science support of projects. Social scientists (including economists) are engaged in all projects, but many are relatively junior, with few taking leadership roles. Strengthening these complementary disciplines (such as livelihood analysis, political economy, institutional and policy analysis and market development) will help to strengthen the impact pathways for the projects and learning on IAR4D.
- IAR4D expertise. While CSIRO scientists have engaged in the intellectual challenge of IAR4D, specific expertise in this area is required to support CORAF/WECARD and CSIRO to better operationalise the concept at project, Partnership and organisational levels.
- Gender and environment expertise. CORAF/WECARD has adequate procedures in place for dealing with gender and environment considerations, but needs access to additional expertise to operationalise those procedures.
- Knowledge management and innovation communication. This is an area of expertise that the Partnership recognises it needs to address to support the IAR4D approach. Expertise in the area will need to address the issue of making information available via databases etc., but it will also need to address a wider set of communication issues related to institutional and policy innovation in the region.

vi. Bring in additional expertise to address institutional development
In revising the program logic it may become apparent that the Partnership needs to provide more institutional development support to CORAF/WECARD. Bringing additional expertise may be one way of addressing this. Bringing in an additional partner might be another way of addressing this. This strategy might also be considered as a way of better accessing the other types of expertise mentioned above.

4.2 Guidance on revisiting program logic and project objectives and strategies

To guide discussions on the revision of the program, in addition to the recommendations above, the review team has developed two schematic tools. The first tool is a framework to help use IAR4D in better framing projects and helping identify development objectives that can be addressed at different stages of the discovery-to-innovation trajectory (Annex 6). This will help the Partnership reconfigure some projects so they have shorter pathways and time frames to impact and, in doing so, provide a diversified portfolio of projects. The aim would be a portfolio with a range of research-for-development experiences to support the IAR4D learning agenda.

The second is a scenario tool to help CSIRO, CORAF/WECARD and AusAID think through how they might balance different objectives in reorienting the program and its projects (Annex 7). These choices hinge on getting the right balance between:

- A research focus that may deliver powerful transformational technologies, but where pathways to innovation and impact are long and uncertain
- Emphasising projects where pathways to innovation are shorter and impact more immediate at local scales, but where there is less emphasis on foundational research and institutional development that will underpin future impact; and
- A focus on capacity building and institutional development supported by IAR4D and which may deliver both quicker project-level impact and impact at scale in the long-term

The review team recognises that these choices are not mutually exclusive, but the tool is designed to help make explicit the assumptions and trade-offs during the reorientation of the projects towards a diversified portfolio.

5. Design Considerations for Phase Two of the CSIRO-Africa Partnership

The review team has been asked to make suggestions on the design of the next phase of the CSIRO-Africa Partnership and to suggest a process for that design. Having only reviewed one of the Partnerships it would be premature to make definitive recommendations. At this stage the review has the impression that the Partnership had a strong rationale (deploying Australian scientific expertise to address agricultural productivity), intent (working through African organisations and systems) and objective. However, for historical reasons, it was less well developed in terms of strategic planning (what is needed to achieve this objective) and in terms of expectations of what can be achieved in the time available (what success looks like). This suggests that the process of designing the next phase needs to address this and that this should take the form of a "strategic discussion" between the key stakeholders. This would focus on clarifying the theory of change for the Partnership program as a whole. This process would resemble the one that has been recommended for the West Africa Partnership, but would need to be done in a way that nested with the overarching AusAID Food Security Thematic Strategy and the stakeholders associated with that.

At this stage of the review it is apparent that a strategic discussion will need to consider the following.

Fit with in the AusAID Food Security Thematic Strategy. The review team notes a number of tensions within the AusAID Food Security Strategy, which is made up of both research-based and development-based interventions under three pillars. These tensions impinge directly on the CSIRO Africa Partnerships, and discussions about phase two in particular:

- A regional versus national intervention strategy and the appropriateness of these strategies for research-based versus development-based interventions
- A results framework that does not take into account the different impact time frames of research-based (mainly long) and development-based (mainly short) development interventions
- Different measures/ perceptions of success in research-based versus development-based interventions
- The separation of research (as the main driver of productivity) from market development and social protection pillars and the weak links between these otherwise complementary endeavours

Better harnessing of systems approaches as a way of achieving impact. Systems approaches to research, innovation and impact are an emerging practice with high potential to improve the effectiveness of research investments. These imply a wider range of activities that span research and capacity building, involve stakeholders beyond research and notably involve the creation of impact pathways for institutional and policy change. The Partnership has an ambition to use these approaches. The implications of this needs to be addressed more fully in terms of design, practice, expertise, partnership and monitoring and evaluation arrangements.

Exploring collaboration between and beyond the two Partnership programs. The East and West Africa Partnerships have contrasting but complementary emphasis on opportunities for technical and institutional learning that would support the overall Partnership objective supported. The same argument applies to the large range of programs in the region that are dealing with complementary generic technical, institutional and policy issues and where cross learning and ad hoc expertise sharing could be achieved. The review has not yet explored the donor landscape to look for complementarities and niche gaps, but this will be done before the development of the final review report.

Defining a responsible exit strategy. AusAID is supporting a novel and challenging program that adheres to aid effectiveness principles. It is targeting agricultural productivity in one of the most complex agro-ecological zones, in a region spanning both Anglophone and Francophone countries, many of which have significant institutional, capacity and infrastructure challenges for agricultural research and development. This is, however, also an appropriate time to think about a responsible exit strategy. If this is not managed carefully there are reputational risks for both AusAID and CSIRO as the Partnership has raised expectations among many regional stakeholders. This exit strategy needs to focus not only on the delivery of high quality research and short-term impacts, but also needs to ensure that the Partnership leaves behind strengthened capacities in the region for using research for development.

Annex 1

MID-TERM EVALUATION OF THE CSIRO AFRICA FOOD SECURITY PARTNERSHIPS WITH CORAF AND BECA: TORS

Background of the program
As part of AusAID's four year African Food Security Initiative (AFSI), Australia is funding a A$12m CSIRO partnership with the Western and Central African Council for Research and Development (CORAF/WECARD) and a A$10m CSIRO partnership with Biosciences Eastern and Central Africa (BecA). The activity which runs from 2010 to 2013 aims to lift food security and agricultural productivity in Africa through joint research; working with and building the capacity of African agricultural organisations.

The CSIRO partnership program is aligned with the framework of the Africa Union's Comprehensive Africa Agriculture Development Programme (CAADP) and is accordingly is being delivered through regional organisations to further build African capability in agricultural development.

AusAID Africa branch is proposing to continue funding past the 2012-13 financial year and a senior management decision is being sought on this. This evaluation will form part of the decision making process.

AusAID is scaling up its food security support in Africa and several new programs/activities are being funded in 2011-12. The Africa Food Security program has been organised into two portfolios comprised of activities focused on a common set of objectives. The CSIRO partnership was the first and is one of the largest activities and sits under portfolio one. The Food Security Program is currently revising its program strategy.

The portfolio details are as follows:
Portfolio one: **Building agricultural productivity through improved research and adoption**. The activities in this portfolio directly address availability related food security challenges (and may indirectly address food access issues). The activities have a strong regional component and broad geographic spread.
Portfolio two: **Building community resilience and sustainable livelihoods**. The activities in this portfolio directly address access-related challenges to food security (and may indirectly address food availability issues). It will strengthen our bilateral engagement in small number of priority countries.

CORAF/WECARD
CORAF/WECARD is the primary agriculture research organisation in West and Central Africa. Australia's partnership with CORAF/WECARD focuses on Farming Systems Research and Animal Health Research projects in the sub-humid-semi-arid region of West and Central Africa. Seven AusAID and CSIRO funded projects are underway in Senegal, Mali, Burkina Faso, Niger, Chad, Cameroon, Ghana, The Gambia and Benin. Each project includes West African National Agricultural institutional partners, sub-regional agribusiness partners as well as experienced researchers from CSIRO.

Partnership objectives
The CORAF/WECARD partnership contributes directly to the implementation of the CORAF/WECARD operational and strategic plans and to the achievement of CAADP Pillar IV in West and Central Africa, specifically, to:

- Add value to crop productivity through more efficient water and nutrient use and management
- Add value to livestock productivity through better feed and animal disease management
- Disseminate relevant agricultural knowledge at the farm and community level
- Build the capacity of institutional partners and community stakeholders
- Develop a research portfolio aimed at addressing market access and informing policy

BecA
The BecA-CSIRO Partnership is a program developed by the BecA Hub, AusAID and CSIRO, which has been framed within the CAADP policy framework for African agricultural development. The Partnership addresses CAADP issues by contributing to CAADP Pillar IV, with implementation of projects and other activities based on the guidelines provided under the Framework for African Agricultural Productivity [FAAP] developed by the Forum for Agricultural Research in Africa [FARA].

CAADP and FAAP provide the strategic basis for agricultural research, technology dissemination and adoption activities throughout African agricultural research

The BecA Hub has been created by AU-NEPAD under the Comprehensive African Agricultural Productivity Program [CAADP] to service the needs of countries in east and central Africa. CAADP's goal is to support agriculture-led development that eliminates hunger and reduces poverty and food insecurity, generating agricultural growth.

Partnership objectives
The BecA-CSIRO Partnership project and capacity building activities have been designed to contribute to a greater or lesser extent to CAADP strategic policies. Within this context, the overarching objective of the BecA-CSIRO Partnership is: **Appropriate resources for increasing agricultural productivity and food security developed and made available.**

Purpose of evaluation
AusAID is consolidating its food security program and increasing its focus on managing for results. The Africa food security team needs to both appraise progress of its activities, and map future directions for the program. The evaluation will be immediately useful to the following stakeholders:

- AusAID senior management
- AusAID and CSIRO desk officers
- CORAF and BecA program and project managers

AusAID senior management will use the findings of the evaluation to verify effectiveness of the CSIRO partnerships and make decisions about how to continue funding the CSIRO partnership activity.

AusAID and CSIRO desk officers will use the findings and recommendations of the evaluation to inform any changes that need to be made to the implementation of the current phase of the activity.

The evaluation will also be used to inform future directions. The design of the extension of the partnership activity will need to ensure necessary outcomes can be met and contain a monitoring and evaluation framework which can capture these outcomes and results. The robustness of the program logic also needs to be examined to ensure the next phase of the partnership is able to produce the stated end of program outcomes.

Objectives and evaluation questions
The mid-term evaluation will **report on progress** towards program implementation, make detailed **recommendations to improve the overall quality** of the CSIRO African partnerships, **develop options to guide the design of a second phase of AusAID support** to 2015-16 and suggest strategies for how the program might be scaled back or concluded post 2015-16.

The evaluation will be based on two field missions; one reviewing the CSIRO partnership with CORAF/WECARD and the second reviewing the CSIRO partnership with BecA. These will need to provide an assessment of how well the CSIRO partnerships have been carried out to date, based on evaluation of the performance and progress of the research projects, engagement in capacity building with African partners and constraints or issues encountered in implementation.

Drawing from the field visits for each of these missions an overall evaluation report will be completed which will address specific evaluation questions.

AusAID will provide evaluation questions, corresponding to these parts. The evaluation team will be given the opportunity to review and revise these questions as part of the evaluation plan preparation process. The questions for the two field missions will address the OECD/DAC criteria and look at effectiveness, impact, relevance, sustainability and efficiency of the partnership activity based on the design and its implementation. The overall evaluation will address whether the program logic in the design documentation is to result in higher level development outcomes. It will also provide recommendations on changes to the design of the partnership activity that can improve ability to reach the development outcomes. Further, it will develop options to guide the design and development of a second 3 + year phase of Australian Government funding for the partnerships, and consider possibilities for program consolidation at the close of this second phase of funding.

Three separate reports will be provided; one for each field mission and an evaluation report for the overall AusAID–CSIRO partnership.

Evaluation process

Task	Time allowed and due dates	Details
Produce evaluation plan for the CSIRO-AusAID strategic review Produce evaluation plan for the CORAF partnership mid-term review	4 days allocated	In consultation with AusAID officers: -review and revise evaluation question provided by AusAID review ToC of activity provided by AusAID -review design documentation -develop plan and share with AusAID officers (plan should include division of responsibility among the evaluation team)
Field visit to Senegal and Burkina Faso	12 days in-country allocated, 2 days travel time. Dates: 22 June – 4 July 2012	Inspect a selection of projects as determined in evaluation plan Meet with various partners Full itinerary will be prepared by AusAID in consultation with the team and CSIRO
Prepare Initial report on CSIRO - CORAF/WECARD partnership (for review and comment by AusAID).	4 days allocated Due 3 August 2012. Comment from AusAID will be provided by 17 August 2012.	Maximum of 20 pages excluding appendices.
Produce evaluation plan for the BecA partnership mid-term review	2 days allocated	In consultation with AusAID officers: -review and revise evaluation question provided by AusAID - review ToC of activity provided by AusAID -review design documentation -develop plan and share with AusAID officers (plan should include division of responsibility among the evaluation team)
Field visit to Kenya	10 days in-country allocated, 2 days travel time. Dates: 10-20 September 2012	Participate in BecA- CSIRO annual review process Visit laboratory facilities Conduct relevant field visits in Kenya
Prepare Initial report on CSIRO-BecA partnership (for review and comment by AusAID).	4 days allocated Due 5 October 2012 Comment from AusAID will be provided by 19 October 2012.	Maximum of 20 pages excluding appendices

Prepare Initial Report on AusAID Food Security in Africa Strategic Review Report for review and comment by AusAID).	4 days allocated Due 19 October 2012 Comment from AusAID will be provided by 2 November 2012.	Maximum of 20 pages excluding appendices
Final versions of: 1. CSIRO - CORAF/WECARD partnership review 2. CSIRO-BecA partnership review 3. AusAID Food Security in Africa Strategic Review	Due 17 November.	Incorporating comments on initial versions from AusAID.

Skills Required for the Evaluation Team:

- Relevant expertise and experience in international agricultural research and agricultural innovation;
- Knowledge of the institutional and strategic context of African agricultural research and development;
- Relevant expertise and experience monitoring and evaluation for agricultural research and development programs, including knowledge of, or ability to build an understanding of the specific requirements of AusAID;
- International organisational and institutional development and strengthening;
- Strong report writing skills

Documentation to be provided:

- Partnership design and contractual documentation
- Relevant AusAID strategic policy documents
- Peer review documentation
- Progress reports and partnership M&E plan
- AusAID Quality at Implementation Report
- Model of program logic for the partnership activities
- Three sets of evaluation questions to inform evaluation plan

Evaluation questions for Africa Food Security mid-term evaluations

Definition of terms:
Project: individual research projects
Partnership activity: the CSIRO and BecA partnership or the CSIRO and CORAF partnership and encompasses the selection of projects
Program: the whole program encompassing the AusAID and CSIRO partnership and their partnerships with CORAF and BecA

Partnership activity level questions for both CORAF/BecA

Effectiveness

- *Are individual projects being designed with and shaped by clearly articulated pathways to impact (theories of change)?*
- *Are project and institutional capacity building outputs on track to be achieved and to what extent will they contribute to program outcomes?*
- *What changes need to be made to maximise chance of the 'end of program' outcomes being achieved?*

Relevance

- *Is the partnership activity aligned with relevant African government and institutional policies, priorities and strategic goals?*
- *Are the projects appropriately matched to the needs of farmers and other intended beneficiaries in the region?*

Sustainability

- *Is the partnership activity strengthening the institutional capacity of CORAF or BecA, in line with its strategic objectives, in a way that allows for the sustainability of the program?*

Efficiency

- *Has the implementation of the partnership activity made effective use of time and resources to achieve the outcomes?*
- *To what extent do Australia's contributions complement and harmonise with the contributions of other donors to CORAF & BecA?*

Overall Program level questions

Relevance

- *Is the program logic sufficiently clear and robust and does the monitoring and evaluation system provide a credible basis for reporting on progress and results?*
- *Does the program represent international best practice in agricultural research for development; if not, how could it be improved?*
- *Is the program aligned with relevant African government and institutional policies, priorities and strategic goals?*
- *Is the program aligned and complementary to similar donor initiatives to improve food security in Africa?*

Effectiveness

- *Are the program outcomes on track to be achieved and to what extent are those outcomes able to contribute to AusAID's higher level food security development objectives in Africa?*
- *What changes need to be made to maximise the chance of linking the activity outcomes to higher level outcomes?*
- *How do African partners view the Australian technical assistance provided to date, and how would they like to see Australia's engagement evolve?*

Impact

- *Are the partnership activities designed to ensure maximum potential impact at scale, in line with partnership objectives?*
- *What impact has there been on our partners in the program (ie. CORAF and BecA) as a result of AusAID funding and their engagement with CSIRO?*

Sustainability:

- *How can partners be supported to continue to develop effective ownership and implementation?*

Further questions:

Consult with CSIRO, AusAID and African partners to develop options for the focus and approach for the second phase of AusAID funding, including opportunities for expansion or contraction of existing projects, or the development of new projects. In doing this, consider the best way of achieving maximum development impacts for the smallest investment.

Recommend an appropriate process and prepare draft Terms of Reference for the design of the second phase of the program.

Annex 2

DRAFT FOR DISCUSSION

DRAFT REVIEW PLAN FOR MID-TERM REVIEW OF THE CSIRO AFRICA FOOD SECURITY PARTNERSHIPS WITH CORAF AND BECA

Introduction
This review plan frames an assessment of how well the CSIRO Africa Food Security Partnerships with CORAF and BecA have been carried out to date. This assessment will be based on the performance and progress of the research projects, engagement in capacity building with African partners and constraints or issues encountered in implementation. This assessment will be used for making recommendations for program strengthening and future directions.

Purpose of Review
AusAID is consolidating its food security program and increasing its focus on managing for results. The Africa food security team needs to both appraise progress of its activities, and map future directions for the program.

AusAID senior management will use the findings of the review to verify effectiveness of the CSIRO partnerships and make decisions about how to continue funding the CSIRO partnership activity.

AusAID and CSIRO desk officers will use the findings and recommendations of the review to inform any changes that need to be made to the implementation of the current phase of the activity.

The review will also be used to inform future directions. The design of the extension of the partnership activity will need to ensure necessary outcomes can be met and contain a monitoring and evaluation framework which can capture these outcomes and results. The robustness of the program logic also needs to be examined to ensure the next phase of the partnership is able to produce the stated end of program outcomes.

Review Objectives
The review has the following objectives:

- **Report on progress** towards program implementation
- Make detailed **recommendations to improve the overall quality** of the CSIRO African partnerships
- **Develop options to guide the design of a second phase of AusAID support** to 2015-16
- Suggest strategies for how the program might be scaled back or concluded post 2015-16

Specifically the review will:

- Provide an assessment of how well the CSIRO partnerships have been carried out to date, based on a review of the performance and progress of the research projects engagement in capacity building with African partners and constraints or issues encountered in implementation.

- Address whether the program logic in the design documentation is likely to result in higher-level development outcomes.
- Provide recommendations on changes to the design of the partnership activity that can improve ability to reach the development outcomes.
- Develop options to guide the design and development of a second 3 + year phase of Australian Government funding for the partnerships, and consider possibilities for program consolidation at the close of this second phase of funding.
- Three separate reports will be provided; one for each field mission and an evaluation report for the overall AusAID–CSIRO partnership.

Review Users
AusAID is consolidating its food security program and increasing its focus on managing for results. The Africa food security team needs to both appraise progress of its activities, and map future directions for the program. The review will be immediately useful to the following stakeholders:

- AusAID senior management
- AusAID and CSIRO desk officers
- CORAF and BecA program and project managers

AusAID senior management will use the findings of the review to verify effectiveness of the CSIRO partnerships and make decisions about how to continue funding the CSIRO partnership activity.

AusAID and CSIRO desk officers will use the findings and recommendations of the review to inform any changes that need to be made to the implementation of the current phase of the activity.

Review Approach
The overall review question provided by AusAID can be stated as follows:

"How well have the CSIRO Africa Food Security Partnerships with CORAF and BecA been carried out to date based on their performance and implementation issues encountered"

The review frames its analysis of the overall performance of the partnership with the following definition of partnership:

A relationship between individuals or groups that is characterised by mutual cooperation and responsibility for the achievement of a specified goal.

Six key dimensions of partnership performance will be explored: program design and logic, alignment with regional strategies and other frameworks, partnership effectiveness, quality of science, impact pathways, and a cross-cutting issue of attention to gender and environmental concerns.

Design and Implementation Logic
The program design makes assumptions concerning the way support of research and capacity building activities leads to higher level development outcomes. Specifically there are assumptions concerning the adequacies of capacities and institutional arrangements in partner organisations and their strategic plans, as well as support provided by the program to convert investments in research into widescale impacts. The evaluation will explore whether these design assumptions and the associated theory of change of the program were realistic and it will assess

whether over time the implementation of the program will be sufficient to achieve high-level development outcomes. An important dimension of this will be to revisit steps in the impact chain to understand the necessary conditions that need to be put in place to achieve higher-level development outcomes. The evaluation will also explore the effectiveness of the M&E system in tracking progress and revisiting assumptions. The review will explore these issues both for the individual partnership programs as well for the overall partnership, where the overarching strategy is understood to be articulated by the Africa Food security Initiative of AusAID. (Steve Ashley with Ian Kershaw and others)

Partnership Effectiveness
Partnership is the central operational approach of the program and is premised on the assumption that a partnership between CSIRO and subregional organisations provides value added compared with other ways of supporting agricultural research for development. In order to understand the effectiveness of this partnership arrangement the review will explore (i) the quality of the partnership, including the degree of collaboration in planning and implementing activities and monitoring progress and the range of institutional issues that effect this (ii) The collaborative advantage of the partnership, including the range of methodological, technical and institutional innovations/ capacity building outcomes that have emerged as a direct result of the partnership (see also quality of science and capacity building theme) (iii) The scope of the partnership, including the role of partner organisations (research vs. administration vs. wider capacity development contributions) and the capacity of partners to play this and other roles that might support the overall effectiveness of the program. (Howard Elliot with Andy Hall and Ian Kershaw)

Alignment with Subregional and Regional Priorities and Strategies
The program frames its research and capacity building activities as a contribution to regional strategies (CAADP Pillar 4 in West Africa and FAAP in East Africa). The review will explore the extent to which the portfolio of projects under the partnership program and capacity building activities align with relevant subregional and regional strategies and ongoing processes to monitor progress in these strategies. Another dimension of this will be to explore wider landscape of donor-supported activities that are contributing to these strategies and the way the partnership program complements these or suggests where synergy could be better achieved. (Howard Elliot with Steve Ashley and Ian Kershaw)

Robustness of Research into Use and Impact Pathways
A key approach of the partnership program in West Africa is the development and use of IAR4D. IAR4D covers a flexible suite of principles and practices that include but are not restricted to: the development of innovation platforms, use of partnerships between research and development and private sector actors; links between research and policy, innovative financing mechanisms; results-based and learning-orientated management approaches. The approach often suffers from attempts to use the key tools as best practice rather than to take inspiration from these to guide a range of best fit arrangements that can help research lead to innovation and impact under different technological, market, social and policy conditions. The review will approach the robustness of research into use and impact pathways by first exploring the way projects have interpreted IAR4D (and allied approaches). It will then explore whether this interpretation of IAR4D is appropriate for the types of research into use tasks that are associated with the partnership program's portfolio of research projects and the results ambitions of these projects and the program as a whole. (Andy Hall with Steve Ashley and Howard Elliot)

Quality of Science and Capacity Building
The rationale for the collaborative advantage of partnerships with CSIRO is that it offers the potential to transfer high performing research methods and approaches from Australian researchers to African partners. Farming systems research and systems approaches more generally are highlighted as a particular strength. The review will explore this by looking for new research approaches that are a direct result of the CSIRO partnership. This will also be explored by judging the extent to which CSIRO scientists are actively involved in research projects rather than in a research management role. (Andy Hall and Howard Elliot with advice from Tristan Armstrong)

Gender and Environment Mainstreaming
Aid best practice demands that all development programs tackle gender and environmental issues in a cross-cutting fashion. The review will explore this by investigating the extent that these issues have been addressed in the selection of projects, choice of research partners, staffing and other management protocols and the extent to which these issues are considered in M&E arrangements. (Ian Kershaw with others)

Review Questions
AusAID provided a set of review questions in the Terms of Reference for the review, including a series of key questions that address the OECD DAC evaluation criteria. These questions were discussed by the review team with AusAID and have been adjusted to take into account the 6 criteria of partnership performance discussed above.

Effectiveness
Partnership performance/ value added
- How well is the AusAID-CSIRO partnership working and what is its value addition over and above direct funding regional organisations or other international research partners?

Partnership scope
- In the future, what should be the balance of emphasis between support for CORAF and support for BecA?
- Is there adequate interaction between the BecA and CORAF partnerships?
- What is the niche that the partnership program occupies? Is this adequate in scope to achieve overall program objectives?

Program logic
- Is the original theory of change still relevant?
- Are current M&E arrangements adequate to address this?
- Are the assumptions about links between program outputs and expected outcomes realistic?
- What mid-course corrections are necessary in the current program and in future strategies?

Impact
Capacity development
- Quality of the biological science methods underpinning the program
- Extent and quality of IAR4D/ research into use arrangements
- Institutional change in partner organisations
- What impact has there been on partners in the program (i.e., CORAF and BecA) as a result of AusAID funding and their engagement with CSIRO?

Evidence of research uptake and use

- Is there any evidence of technology dissemination/ uptake?
- What are the necessary conditions for this to take place?

Evidence of higher-level development impacts

- Are the partnership activities designed to ensure maximum potential impact at scale, in line with partnership objectives?
- Are there any impacts on food security and agricultural productivity?
- When are these likely to emerge and under what conditions?

Relevance

Alignment

- Is the program aligned with national, sub-regional and regional agricultural research and development frameworks (CAAPD, FAAP, AU-NEPAD)?
- Is overall program-level M&E working adequately and well enough linked into AusAID's food security strategy for Africa?
- Is the program logic sufficiently clear and robust and does the monitoring and evaluation system provide a credible basis for reporting on progress and results?
- Does the program represent international best practice in agricultural research for development; if not, how could it be improved?
- Is the program aligned with relevant African government and institutional policies, priorities and strategic goals?
- Is the program aligned and complementary to similar donor initiatives to improve food security in Africa?

Sustainability

- Is the partnership activity strengthening the institutional capacity of CORAF or BecA, in line with its strategic objectives, in a way that allows for the sustainability of the program?
- What wider set of implementation issues and contextual issues affect sustainability?
- How does the wider landscape of donor and national and sub regional and regional support/ funding affect sustainability?

Efficiency

- Are the program outcomes on track to be achieved and to what extent are those outcomes able to contribute to AusAID's higher-level food security development objectives in Africa?
- What changes need to be made to maximise the chance of linking the activity outcomes to higher-level outcomes?
- How do African partners view the Australian technical assistance provided to date, and how would they like to see Australia's engagement evolve?
- Is CSIRO and the partnership program an effective vehicle to help build capacity for high impact research/ IAR4D?
- Are there rigidities that are preventing CSIRO taking on a role beyond farming systems/ scientific focus?
- Do they need additional support in exploring new methods, training staff, etc.?

Cross cutting

- How well are the partnerships dealing with gender equality issues and is adequate attention being given to environmental impact and climate change issues?

Review Approach

The review will use the questions outlined above to guide its analysis of program documentation and discussion with partners and stakeholders in impact pathways. In-country missions will use a combination of informal participatory workshops and one-to-one meetings to both develop an analysis of the performance of the CSIRO-Africa partnership and to share and develop and recommendations for ways forward.

The CSIRO-CORAF Partnership will be reviewed through an in country mission in June–July 2012 and reported in August 2012. The CSIRO-BecA Partnership will be reviewed through an in-country mission in September 2012. An overall review report will be prepared based on these two partnership reviews.

Annex 3

PERSONS AND ORGANISATIONS CONTACTED

AusAID

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Deputy Director of INERA

Annex 4

GENDER ASSESSMENT

One of the 'extra dimensions' required to enable research to become an effective engine for development is the need to consider the social and cultural factors that could enable or constrain the innovation process. In particular, careful attention needs to be given to the important influence of gender roles in agricultural production and rural development. Consideration of gender is also important to ensure that women have equitable opportunities to benefit from program investments and that Australian support helps to reduce gender disparities.

The review team used the following guiding questions in order to assess the degree to which the Partnership has been able to integrate gender considerations into its work to date.

1. Are gender equity objectives and processes adequately reflected in CORAF/WECARD's policies and strategies and is it encouraging implementing partners to consider gender in research activities?

At the time the CSIRO-CORAF/WECARD Partnership was initiated, CORAF/WECARD did not have a formal policy or strategy for integrating gender considerations into its work. With support from DFID and other partners, CORAF/WECARD developed a Gender Policy and Strategy[8] in 2010, which includes the following objectives:

- Inculcate a long-term institutional gender expertise in CORAF/WECARD to enable staff to systematically incorporate gender issues into all programs.
- Ensure that research programs of CORAF/WECARD affect women and men equitably and gives consideration to their specific needs and concerns during planning, implementation and evaluation.
- Include gender analysis, particularly the collection and analysis of disaggregated data by sex, in methodologies of research programs of CORAF/WECARD.
- Assist the institutions of the NARS of member countries of CORAF/WECARD to formulate national strategies to reduce gender disparities in agricultural research programs.

The Policy and Strategy is therefore consistent with CORAF/WECARD's mandate to help build the quality of agricultural science in the region by demonstrating best practice and building capacity to conduct research guided by the principles of Integrated Agricultural Research for Development (IAR4D). These objectives are also consistent with AusAID's own gender equity strategy.[9]

The Policy and Strategy therefore provides a strong policy basis for gender integration into CORAF/WECARD's programs. Following consultations with CORAF/WECARD region stakeholders, the Policy and Strategy was approved by the CORAF Board in November 2010.

[8] *Gender Policy and Strategy of CORAF/WECARD*, November 2010
[9] *Gender Equality in Australia's Aid Program – Why and How*. AusAID, 2007

The Policy and Strategy proposed activities to build CORAF/WECARD staff capacity, assist NARS to implement gender policies and facilitate gender analysis in research programs. In July 2011, CORAF/WECARD also held a two-day workshop in Conakry to develop a Gender Plan of Action that could assist in operationalising the policy and strategy.

Is CORAF/WECARD actively encouraging and supporting the NARS to incorporate gender considerations into their research programs? CORAF/WECARD did host a Learning Workshop on Mainstreaming Gender in Agricultural Research and Development Programmes for a number of NARS members and convened stakeholder consultations on the development of the Gender Policy and Strategy, and the Action Plan. Overall though, these are tentative steps. A more active program would be required in order for CORAF/WECARD to take a leadership role in the region.

2. Do project designs and the prioritisation of research investments recognise gender roles in the agricultural systems of the region and the particular needs, priorities and preferences of men and women?

Although the selection and design of the Australian partnership projects commenced before these CORAF/WECARD policy and strategy documents were endorsed, the two processes proceeded in parallel. The design document for the Partnership recognised these developments and committed to supporting the operationalisation of the policy, once endorsed by the Board:

> "…the partnership will consider its implementation within the Partnership activities where appropriate, and will specifically support CORAF/ WECARD in ensuring that monitoring and evaluation approaches on each research project includes gender-based M&E."

The review team found that CORAF/WECARD and CSIRO sought to reflect some of these emerging principles and considerations into the Partnership project designs, but a more consistent or structured approach would have yielded better results.

Although the intention had been to undertake a gender analysis for each of the partnership projects, none have actually been undertaken. The various baseline studies have sought to address some gender issues, but none of the projects have undertaken any structured analysis of how gender roles might be taken into account in the design or implementation of the projects. Although the Review Team was not able to undertake detailed analyses of the projects, this gap risks undermining the quality of the science upon which the research is based.

The choice of projects and their designs do reflect efforts by the program partners to ensure a reasonable balance in focus between areas of enquiry likely to benefit men and those likely to benefit women.

3. Does the composition of project research teams reflect appropriate gender balance?

Although project partners reportedly aimed to seek a reasonable gender balance in the research teams, this has proven difficult to achieve. Only three of the 1seventeen CSIRO research scientists involved in the program are female and this includes none of the senior CSIRO scientists. All the CORAF/WECARD scientists involved are male. Some projects do include women scientists in leadership positions, but all of these are from national level research partners. On this measure, neither

CORAF/WECARD nor CSIRO have been able to demonstrate leadership to their NARS partners.

4. Do women have opportunities to participate in project activities (e.g., in innovation platforms, on-farm trials, training and demonstration events) proportionate to their roles in the target production and marketing systems?

The partnership has had some success against this measure. For example:

- The Small Ruminants project explicitly aims to have a 50:50 representation of women and men on its innovation platforms, and early data (for example from The Gambia) indicate that this aim has been met.
- The Seed Systems project includes a similar commitment, with disaggregated data collected to monitor progress (e.g., 35% of baby trials are on women's plots (82/132) and 48% of those attending field days are women (530/1100)).

Such examples are welcome signs that efforts are being made to mainstream gender considerations into the research program. However, by and large the projects lack the kind of analysis of gender roles that might underpin a more rigorous approach to the issue. 50% female participation may be appropriate if 50% of end-users or decision-makers are female. If, however, 80% of decision-making on seed choice were undertaken by women, then 50% would still be missing the mark. Similarly, if 80% of decision-making is by men, then 50% would be similarly inappropriate, unless the approach had been part of a carefully considered program aimed at empowering women in such decision-making.

Overall, the review team concluded that a more sophisticated and more rigorous approach to research method is required with respect to gender participation.

5. Do strategies for extension/dissemination/communication of innovations arising from the research recognise the likely roles of female producers/end users in adoption and address the particular barriers which women face?

By and large, it is too early to assess how well gender is being considered in communication and dissemination strategies, since that stage of the program is yet to commence. It is important nevertheless that adequate attention is given (e.g., in baseline studies and gender analyses) to the constraints women face in embracing innovations, so that appropriate strategies can be devised when suitable innovations are identified through the research. For the same reason it is essential that women's participation in the research program is carefully calibrated to their likely roles in the adoption of innovations being studied.

6. Are appropriate indicators of gender equity included in the M&E framework?

Some have been included, but more could be done.

7. Does the partnership have adequate access to gender expertise for project design, implementation and monitoring?

No. Recognising that a lack of internal expertise is holding back progress on this agenda, CORAF/WECARD is currently in the process of recruiting a gender specialist, to lead the implementation of the Gender Action Plan.

This has been a gap in Australia's support to the program to date (why didn't CSIRO engage a gender expert?). If required by CORAF/WECARD, additional support should be provided from the Australian side in future.

Overall Assessment

Although there have been some moves towards integrating gender considerations into the research partnership, progress has been limited to date. CORAF/WECARD has over recent years made considerable progress at the central level by establishing its gender policy, strategy and action plan. The challenging process of putting that strategy into effect through its partnerships and programs is now commencing. To do this effectively, CORAF/WECARD and the CSIRO partnership must move beyond gender training, arbitrary participation targets and disaggregated monitoring indicators. Gender needs to be established as an integral part of the research method if it is to have real meaning for participants and real outcomes for beneficiaries.

Australia should seek to ensure that in its partnership with CORAF/WECARD, it effectively supports and reinforces that process of integrating gender as a core element of the IAR4D approach. Australia should stand ready to provide specialist support to this process, if and when required by CORAF/WECARD and its implementing partners. The suggestion in the Annual Partnership Report that a gender specialist be engaged to "undertake a brief gender assessment of each project, and the overall Partnership, and to identify practical actions that could strengthen the ways they are incorporating gender equity" would be a good first step.

Annex 5

ENVIRONMENT AND CLIMATE CHANGE ASSESSMENT

1. Was an assessment made by AusAID at the design stage of the potential for the partnership program to have a significant negative impact on the environment?

We assume the program was subject to AusAID's normal (basic) environmental screening, in accordance with the Environmental Protection and Biological Conservation Act.

2. What policies and procedures does CORAF/WECARD have to ensure that activities supported through the CSIRO partnership are screened for potential negative environmental impacts?

CORAF/WECARD has considerable experience with environmental management processes, since many of its programs are subject to the environmental safeguards assessments required by other donors, in particular, USAID and the World Bank. In essence these include much the same steps as required by AusAID's environmental management system: identifying key environmental risks; assessing those risks; adjusting investment strategies to avoid high risk activities; and devising measures to manage and mitigate risks in those activities which are implemented.

In 2008, CORAF/WECARD developed its own Environmental Management Framework (EMF) to clarify its requirements. The EMF includes the following key elements:

vi. **Negative list** – list of activities, or characteristics of activities, that cannot be supported
vii. **Policies** – minimum environmental management policies and standards to be incorporated, based on World Bank safeguard policy requirements. This includes strict requirements related to physical construction works, resettlement, critical natural habitats, forest developments and the use of pesticides products and genetically modified organisms
viii. **Processes and responsibilities** – description of the processes to be followed in implementing the EMF, and assignment of responsibilities for these processes
ix. **Capacity building** – training and technical assistance that will be provided to build capacity so that EMF responsibilities may be successfully fulfilled;
x. **Monitoring** measures that will be taken to monitor, report and strengthen implementation of the EMF

All project proposals for funding through CORAF/WECARD must include a declaration that none of the proposed activities infringe the requirements of the EMF. All proposals are subject to environmental screening by CORAF/WECARD before they can be submitted to the Board for approval. Where potential conflicts with the EMF arise, the proponents are required to propose mitigation measures or commission an environmental impact assessment.

A 2011 mid-term review of CORAF/WECARD's Operational Plan pointed out that the organisation's focal point for environment does not have training in environmental assessment, and recommended he be supported by external specialist expertise. This is primarily an internal management issue for CORAF/WECARD, but there may

be a role for additional CSIRO support, given its deep expertise in ecological systems and environmental science.

3. In designing the program and in prioritising research investments, to what extent was consideration given to seeking a positive environmental impact from activities funded under the program?

All of the projects supported under the Partnerships reflect in some way or another the aim of supporting environmentally sustainable agricultural development:

- The farming systems projects are all exploring viable approaches to 'sustainable intensification' of local farming systems. That is, seeking innovations that will increase agricultural productivity, while strengthening the resilience of the natural resource base underpinning the agricultural systems.
- The WECATIC project is exploring tick control measures that can deal with the inappropriate use of pest control chemicals, and the problems this causes, including the build-up of resistance by ticks to such treatments.
- The seed systems project includes in its trials, improved varieties that offer the prospect of improved drought resistance.

4. In designing the program and in prioritising research investments, to what extent was/is consideration given to climate change mitigation or adaptation benefits from activities funded under the program?

In recent years, CORAF/WECARD has been engaged in several activities exploring the potential for programs related to climate change. In 2010 a Climate Change Strategy was drafted which explored the vulnerability of West and Central Africa to climate change and its likely impact on farming communities, ecosystems and agricultural production. It outlined adaptation and mitigation options and established principles and recommendations to guide CORAF/WECARD's research programs, particularly in the Natural Resource Management theme.

Clearly there are many intersections with the current portfolio of partnership projects, including:

- CORAF/WECARD looking at climate change and is investing in several programs
- Also developing a CC strategy
- CSIRO has supported a climate study and soils study
- Several of the projects include a climate change resilience focus

Annex 6

Unpacking IAR4D and a Framework for Developing a Portfolio of IAR4D Projects

Introduction
Integrated Agricultural Research for Development (IAR4D) is an emerging research practice that seeks to improve the impact of agricultural research. It has been adopted by the CSIRO-CORAF/WECARD Partnership projects. This is in line with CORAF/WECARD's strategic plan, which highlights IAR4D as an approach that drives its key result areas, and 'constitutes the nucleus of the paradigm shift away from conventional research focusing on the technology packages' (CORAF, 2007). For the purpose of this review and its recommendations on ways forward for the Partnership, it is important to unpack what the reviewers understand by this approach. This is particularly important because ideas around IA4RD have only started to emerge in recent years and different stakeholders understand its practice in different ways.

The elaboration of IAR4D in this Annex is used to develop a framework to help revise the existing Partnership projects into a portfolio that will provide opportunities for quicker impact and which will support the IAR4D agenda of learning-driven capacity development in the region.

Why IAR4D?
Before explaining what IAR4D is, it is useful to explain why it is necessary to reframe agricultural research. At the heart of this reframing is the ambition to make better use of agricultural research investments in the development process. This is not to say that research has not been valuable in the past. Rather, increasingly, there is recognition that good research doesn't necessarily lead to development. Similarly, there is also recognition that development is now understood as a highly complex process of change that involves many organisations and processes and where change involves technological changes as well as capacity changes — the latter of which, itself, has organisational, institutional and policy dimensions.

Is this new?
These sorts of ideas are not entirely new to the international development community. For example, the research community has different sorts of research projects — some looking at biophysical issues, some looking at institutional and policy issues. Development projects tackle different aspects of capacity development — strengthening organisations, introducing new approaches and making resources available for new sorts of activity. Other drivers of the development process include entrepreneurs pursuing market-led opportunities. These are becoming more prominent in the last decade and are only just being factored into the design of development assistance programs.

Putting the pieces together
The problem with all this is that while this range of activities is being recognised as important, these are all organised and conducted independently, with separate bureaucracies and institutional arrangements. So, on the one hand, we have an understanding of development as an integrated, multifaceted and complex process, but, on the other hand, in practice we have the artificial separation of different parts of the puzzle — even the separation of different types of research. This is increasingly problematic for agricultural research because there is now growing

consensus that research becomes valuable when it is married up with developmental and entrepreneurial activities and when other forms of supporting change allow ideas from research to be used for development: for example, alliances between research and development organisations or entrepreneurs or the market and changes that support technical change (World Bank, 2006; Hall, 2011).

This suggests that in order for agricultural research to effectively contribute to development it needs to be reframed as an activity that bundles together different sorts of research and bundles together research with entrepreneurial activity and activities that build capacity by stimulating organisational, institutional and policy change.

How do we know how to do it?

There is one further dimension of reframing that needs to be considered along with the need to integrate or bundle together activities and actors. It concerns the question of how one organises these different activities, organisations and processes in such a way that research plays a valuable role in development. Surely it can't be the same in different countries or subsectors or under different stages of social and market development? The answer is we don't know how to organise this, at least not in a specific sense, and this has to be learnt. The implication of this is that there is a need to have an approach that frames this learning.

If this sounds rather abstract, it is useful to start by thinking about the more familiar form of learning — the technology development process. A new technology is developed through both a structured learning process (scientific research) and through a learning-by-doing process (adaptation and practice) — the latter often generates questions for the former to address. The power of scientific research is that over time its practice has learnt increasingly effective ways of problem solving and discovery. This is backed up by communities of research scientists sharing both analyses and — of equal importance — methodological breakthroughs. In other words there is a continuous process of learning how to do scientific research better.

To take the argument further, just as we don't know how to organise for development, we never know the technological answer to a problem in advance. However, we know how to produce this answer because we have a learning tool called scientific research. And this has a third learning loop that builds the capacity of scientific research as it goes along — the first loop solves the problem, the second loop improves methods to solve problems and the third loops improves how science is organised to develop and share improved methods and hence solve problems.

Learning how to use research for development

This same argument holds true for the question of how we organise so that scientific research can play a valuable role in development. We don't know how to do it, so what is required is a process that involves these three loops of learning. In practice this is completely analogous to the way scientific research works. It requires communities of researchers and development practitioners (in the widest sense) sharing analyses and methodological breakthroughs from both research and practice and continuously learning how to do research for development better. The only difference is that because we are bundling together research (of different sorts) and development and entrepreneurial activity, it is much more complicated. For example, the learning community (or communities) will involve researchers, technology users (from farmers to policy makers), development organisations and market players and unlike the scientific research community there are no traditions, rules or structures that frame how this learning should take place in this landscape.

What is therefore required is an approach that frames this sort of triple loop learning and capacity building. This learning is, therefore, a critical dimension of helping address the issue of making better use of research for development. What might this look like in practice?

Loop 1: Communities or networks of researchers, research users and development organisations **engaging** in the resolution of technical, institutional and policy dimensions of a particular problem set or opportunities
Main activities: Market and development interventions supported by research and learning by doing
Operational focus: Projects

Loops 2: Communities or networks of researchers, research users and development organisations **developing and sharing lessons on how to engage** in the resolution of technical, institutional and policy dimensions of particular problem sets or opportunities
Main activities: Reflective learning supported by research, monitoring and evaluation and knowledge management
Operational focus: Portfolios of programs or projects

Loop 3: Apex bodies of communities or networks of researchers, research users and development organisations developing and sharing lessons on how to strengthen the process through which Loop 2 lessons are developed and shared
Main activities: Research on learning management and knowledge management
Operational focus: National, regional or international coordinating bodies

Integrating Different Types of Research and Action and Integrating Different Types of Learning
To summarise the above, the ambition to use research for development better requires a framework that helps with two types of integration. The first concerns the integration of research (of different types) with market and capacity development/ development activities. The second concerns integrating different forms of learning so that there is a continuous process of strengthening the capacity to use research for development. Is this what we mean by IAR4D?

A Definition of IAR4D?
Different organisations have adopted different definitions of IAR4D. These vary in terms of the emphasis given to different dimensions of the IAR4D approach outlined above.

For example, a recent FARA publication (A.A. Adekunle et al., 2011) defines IAR4D as follows:

> "The (IAR4D) approach is based on an innovation systems framework. This brings together multiple actors along a commodity value chain to address challenges and identify opportunities to generate innovation. The approach creates a network of stakeholders or partners who are able to consider the technical, economic, social, institutional, and policy constraints in an environment. The network facilitates research and learning that not only generates new knowledge, products or technologies, but also ensures the use of research products."

The CORAF/WECARD strategic plan (CORAF, 2007) provides the following definition:

> "The new paradigm of the Strategic Plan places great emphasis on an innovation systems approach typically referred to as IAR4D. The paradigm puts farmers and users at the centre of innovative practices, but also encourages learning through the interchange of ideas, successes, and failures between stakeholders."

Both these definitions point to innovation systems as a founding concept, but give different emphasis to value chains and learning and capacity building as the key operational focus. Hawkins et al. (2009) present a comprehensive review of the IAR4D concept. They define it in the widest possible terms to encompass much of current thinking about agricultural innovation and development. However, they finally give most emphasis to the institutional and behavioural changes required among researchers and other development stakeholders in order to operationalise the concept.

Yet another interpretation of the related idea of AR4D by Mbabu and Ochieng (2006) gives centrestage to a cascading logic that links research with a wider set of actions and policies that together stimulate innovation and the achievement of higher order development goals such as food security and poverty reduction. This implies links between researchers and market and development actors and between research and policymakers. It also gives emphasis to a results and learning-based approach to capacity development at the individual, organisational, institutional and policy levels (*ibid*).

Unpacking the Partnership Definition of IAR4D

There are a number of key elements that seem to be generally agreed upon. The CSIRO/ CORAF/WECARD Partnership design document cites these elements as follows:

> "Engagement and partnership with a full range of stakeholders, targeting change and adoption of new practices at various scales from on- farm to policy, and an embedded capacity building and learning focus for all stakeholders". (emphasis added by the author)

It is useful to unpack these elements so as to better understand what the Partnership's interpretation of IAR4D might imply in practice. But to unpack these elements it is necessary to do so from the perspective of the conceptual origins of IAR4D and this conceptual origin is generally recognised to be the idea of an innovation system. Much has been written in recent years on the use of innovation system ideas as a way of planning agricultural development (World Bank, 2006; 2012). Box 1 below distills out the main insights from this perspective. (Note that these state the same ideas as those expressed in the rationale for reframing agricultural research, but only in a more formal and generic way).

BOX 1. Main Insights of an Innovation System Perspective

- It shifts/ expands attention away from technology as the main driver of social and economic change and instead focuses on behaviour and capacity of systems to support learning and change around specific problem sets or opportunities.
- It recognises that change/ innovation requires different types of learning — technological learning (developing and using more effective technology), organisational and institutional learning (doing things in a more effective

way) and policy learning (more effective incentives, regulations and investments).
- It recognises that learning involves accumulating, accessing and assimilating information in different ways and from different sources through research and practice and through search and interaction.
- It recognises that since interaction of different information sources is so critical in supporting learning, innovation normally emerges from an architecture that looks like a network with multidirectional information flows rather than like a delivery pipeline driven by research.

Change and adoption of new practices. Implies an approach that goes beyond research and which links research towards the wider process of innovation.

Partnership: Implies an approach that makes use of a variety of multistakeholder mechanisms (innovation platforms, consortia, learning alliances, network, marriages of convenience, etc.).

Multiple scales, farm-to-policy: Implies an approach that addresses issues at these multiple scales. It combines biophysical research with institutional and policy research and it involves deploying different mechanisms to develop links and facilitate learning with stakeholders at these different scales — farm groups, development coalitions, public-private sector consortia, policy forums, etc.

Capacity building and learning: Implies an approach with an explicit capacity building agenda that covers the full range of dimensions of capacity: skills, organisational structures, institutional arrangements and policies needed to respond to an evolving environment though learning, innovation and change.

What will IAR4D projects look like?
These principles of innovation systems in Box 1 may sound rather esoteric, but these have very practical implications for IAR4D as an approach based on this concept. It suggests that projects need to have the following features:

i. Expanded scope of research and learning: Projects are both multidisciplinary (combining different skills) and interdisciplinary (combining concepts from different disciplines) in order to investigate biophysical systems and phenomena as part of the wider innovation system of institutions, markets, and policy and development processes. Projects use diagnostic tools to define systems research questions and activities and identify partners and stakeholders.

ii. In-built impact pathways: Projects combine research and development activities through partnerships and networking to develop links to users of research, other sources of information and learning and complementary investments and activities. Projects use multi-stakeholder approaches, including innovation platforms to define and address objectives in ways that encourage wider stakeholder collaboration at different levels — farmer, research community, development community, market actors and policy-makers.

iii. Capacity building on organising for learning: Projects and programs experiment with ways of organising learning to improve the effectiveness of using research for development. Projects and programs use research, process monitoring,

knowledge management/ innovation communication and training to improve and share lessons on the effectiveness of multi-stakeholder and other approaches that support technical, organisational, institutional and policy learning.

A Framework for Developing a Portfolio of IAR4D Projects

One of the implications of an IAR4D approach is that it needs to take a program or portfolio approach to learning. The reason for this is that the approach implies both learning more effective methods for using research as well as learning how to organise learning more effectively — so called triple loop learning. This is a very important aspect of CORAF/WECARD's use of IAR4D, because it is being used as a way of building capacity in the region to use research for development. One of the implications of this is that learning about how to use research for development needs to be undertaken systematically at both the project level and at the program level, with clear links between the two.

At the same it also needs to be recognised that research is used in different ways in different projects as it has multiple roles in the innovation and development process: discovery, adaptation, problem-solving, validation of practices, explanation, troubleshooting, and training and capacity building. Therefore, to learn how to do research for development, an understanding of the different role of research and the links between research and development in these different roles is required. This suggests that a portfolio of projects is needed: some nearer to innovation with research as a service provider to development and with clear impact pathways; and some nearer to discovery, with research presenting opportunities for development activities. Organisational grouping and institutional arrangements will be different in these contrasting circumstances and need to be understood and shared to fulfill the wider capacity development agenda of IAR4D.

A useful heuristic to help visualise this is the idea of an innovation trajectory.

An innovation trajectory is the process where, over time, knowledge and practices from different sources, including research, but also from development agencies, entrepreneurs, etc., lead to outcomes with social and economic significance (this is the definition of innovation). This illustrated by Figure 1, and explained by Table 1.

Figure 1. Innovation Trajectory

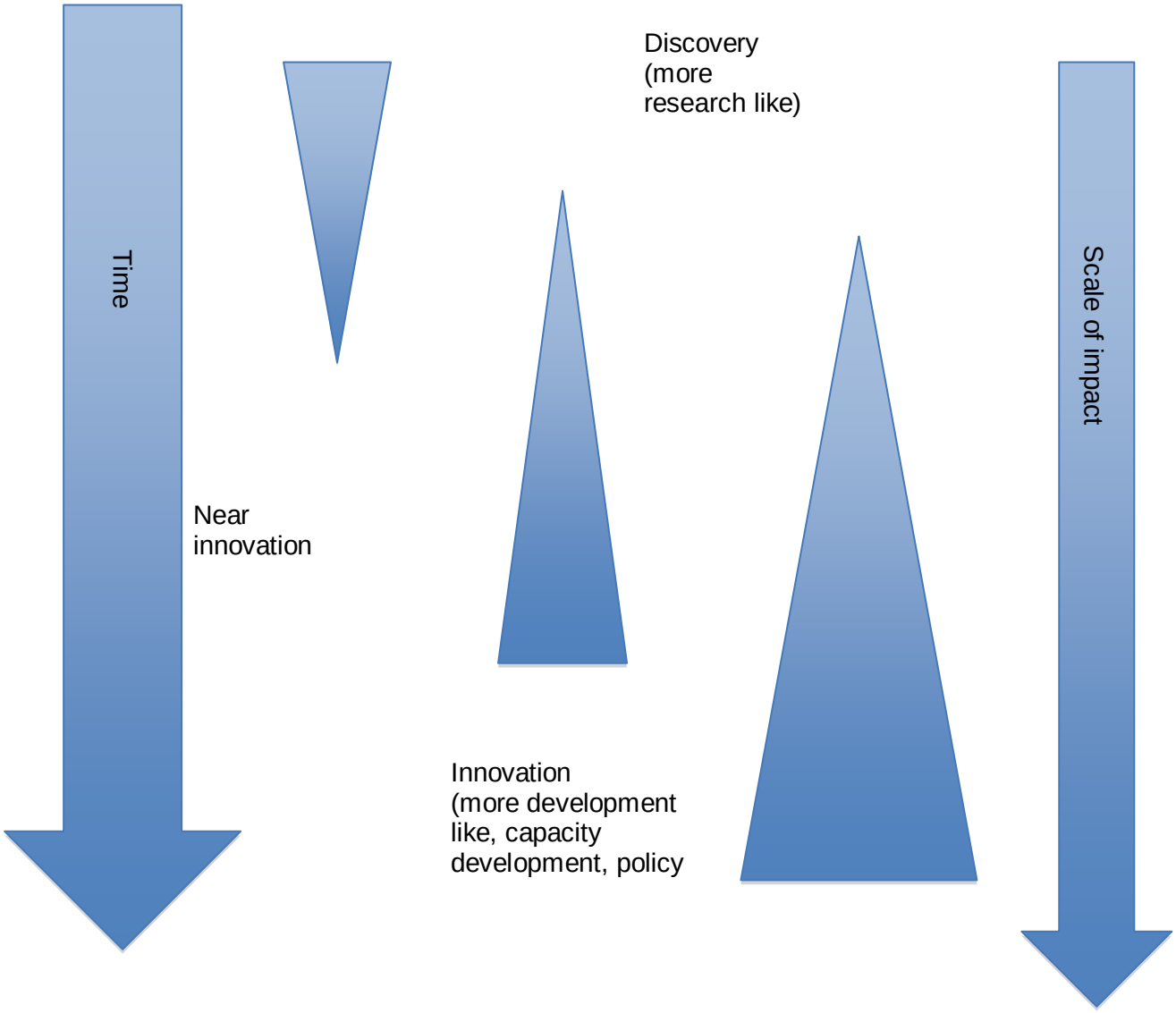

Table 2

Stages in the innovation trajectory	Main Activity	Outcomes	Risk and Scale of Impact of Research	Role of and Form of Multi stakeholder Platforms	What Success Looks Like
Open-ended discovery	Scientific research	New knowledge	High risk low scale	Organising learning with farmers	**Research projects** addressing identified regional research priorities
Near innovation	Use of research and communication to support market-based or development interventions and policies	Technical, institutional and policy innovations at a pilot scale	Medium risk/ medium scale	Organising learning to address market and social opportunities and problem sets	**Portfolios of innovation projects** structuring learning on regional themes
Innovation	Knowledge and learning management, communication for innovation	Technical institutional and policy innovations at national and regional scale	Low risk/ large scale	Organising communities of practice on national and regional themes	**A continuously evolving capacity** to use agricultural research for development at the regional level

While Figure 1 shows three distinct phases of the innovation trajectory, in actual fact there is a continuum between the three. For planning purposes Table 1 makes this continuum more evident.

Applying the Framework

Currently many of the Partnership's projects are at or towards the discovery end of the innovation trajectory. This framework helps in the following ways:

- It identifies opportunities to move different projects (or aspects of individual projects) closer to innovation and, by doing so, helps develop a diversified portfolio of projects that can support learning about how to use research for development.
- It clarifies impact pathways and the nature and scale of impacts at different stages of the innovation trajectory. In doing so it helps identify opportunities for quick wins in projects that feasibly address issues further down the innovation trajectory.
- It clarifies the role of research in each project and the balance between biophysical discovery and learning that leads to capacity development. In doing so it helps identify which sorts of organisations lead or champion projects and related initiatives.
- It highlights the innovation platform as the key multi-stakeholder facilitation device of current projects, which will assume different forms in projects at different stages of the innovation trajectory.
- It highlights the need for a wider set of activities and skills beyond research at different points in the innovation trajectory.

Annotated Bibliography

Where possible links to full downloads of the works listed below are provided at http://innovationstudies.org/index.php?option=com_content&task=view&id=309

A.A. Adekunle, J. Ellis-Jones, I. Ajibefun, R.A. Nyikal, S. Bangali, O. Fatunbi and A. Ange (2012). Agricultural Innovation in Sub-Saharan Africa: Experiences from Multistakeholder Approaches. Forum for Agricultural Research in Africa (FARA): Accra, Ghana.
This paper reviews 21 case studies from Africa to illustrate multistakeholder approaches to agricultural innovation. Given that "there have been few success stories in the agricultural sector across SSA, where multiple stakeholders have worked closely together to foster agricultural innovation", this paper feels it is useful to document success stories and identify reasons for their success.

Hall, A. (2011). Putting Agricultural Research into Use. Lessons from Contested Visions of Innovation. UNU-MERIT Working Paper 2011-76. Maastricht: United Nations University-Maastricht Economic and Social Research and Training Centre on Innovation and Technology.
This paper summarises the experiences of the Research Into Use (RIU) program. It has three key messages. First, research into use is not a two-stage process of research, then research into use. Research has a valuable (although differing) role at all stages of the innovation process and this suggests that research-like and development-like activities need to be blended in projects. Second, there are a number of different starting points for projects seeking to enable innovation — technology, markets, policy, capacity (the establishment of innovation platforms, for example). All of these are valid as long as they explore and tackle the second generation challenges that inevitably emerge. And this almost always means tackling policy and institutional issues. Third, leadership of such projects needs clear vision of the range of actions that support innovation and not get stuck either in business as usual or in cherry picking fashionable tools (innovation platforms, private sector-led development, etc.). Enabling diversity in pragmatic, horses-for-courses sorts of ways is key.

Hall, A. (2009). Better Research Communication: Will it Enhance Innovation and Impact. LINK Look Feb-March 2009. Learning Innovation and KNowledge (LINK): Hyderabad.
This editorial explains that communication of research results will not necessarily help impact, particularly in the context of policy research. It argues that research needs to be better embedded in the policy process, responding to demands and taking advantage of windows of opportunity. It gives an example of this from Nepal. This might be useful in starting to think more widely about the notion of communication in relation to innovation.

Andy Hall (2007). "The origins and implications of using innovation systems perspectives in the design and implementation of agricultural research projects: Some personal observations." UNU-MERIT Working Paper Series #2007-013, United Nations University-Maastricht Economic and social Research and training centre on Innovation and Technology: Maastricht, The Netherlands.
This paper examines systems thinking in the design of research projects. It documents the experiences of a group of researchers in who experimented with this framework and tried to operationalise its principles in project design. The paper comments on some of the implications of using this approach and the challenges it presents for implementers of agricultural research projects in developing countries.

Hall, A., Rasheed Sulaiman, V. and Peter Bezkorowajnyj (2007). Reframing Technical Change: Livestock Fodder Scarcity Revisited as Innovation Capacity Scarcity. ILRI and UNU-MERIT.
This is the conceptual framework of a project that had many parallels with the NRM projects of the CSIRO/ CORAF partnership program. It sets out the rationale for approaching systems upgrading not as a technological issue per se, but as a capacity issue looking at the types of clusters of organisations and policies needed to make innovation happen. The researchable question was about how to facilitate this to take place. It has case studies that give evidence of how such processes of innovation take place in the livestock sector. It focuses on India and Nigeria. It also has some discussion about the implications of a project like this for M&E arrangements.

Hawkins, R., Heemskerk, W., Booth, R., Daane, J., Maatman, A. and A.A. Adekunle (2009) (with contributions from Nederlof., S., Defoer, T., Sellamna, N., Gildemacher, P. and Enserink, D.). Integrated Research for Development (IAR4D): A Concept Paper for the Forum for Agricultural Research in Africa (FARA) Sub-Saharan Africa Challenge Programme (SSA CP). 92 pp., FARA: Accra, Ghana.
This paper, written for FARA as a working document on the IAR4D concept, attempts a description of IAR4D, traces its evolution and enumerates and explains some of its key (four) descriptive principles. The authors attempt to illustrate how each principle could be incorporated in development practice, illustrating this through 13 case studies — essentially IAR4D as a set of 'good practices or actions'.

Laurens Klerkx, Andy Hall and Cees Leeuwis (2009). Strengthening Agricultural Innovation Capacity: Are Innovation Brokers the Answer? International Journal of Agricultural Resources, Governance and Ecology, **vol. 8(5), pp. 409-438.**
This paper examines the role of innovation brokers in stimulating innovation system interaction and innovation capacity building. It reflects on the potential role of innovation brokers in developing country agriculture.

A. Maatman, Clottey, V.A., Diallo, A., Djagni, K., Duplessis, Y., Gyasi, K.O., Kabore, M., Keita, F., Kondo, K., Konlambigue, A., Kpogan, E., Rudiger, U. and A.S. Traore (2011). Competitive Agricultural Systems and Enterprises (CASE): A Grassroots Approach to Agribusiness Development in Sub-Saharan Africa. Volume 1: Reference Framework and Early Experiences. IFDC and CTA: The Netherlands.
Documents IFDC's experience of linking together soil fertility and productivity enhancement with market development. Doesn't use the innovation platform language but is using these sort of ideas pragmatically to achieve similar ends to the CSIRO/ CORAF partnership in West Africa. The country case studies are all West Africa.

Mbabu, A. and C. Ochieng (2006). Building an Agricultural Research for Development System in Africa. ISNAR Division Discussion Paper 8. International Food Policy Research Institute (IFPRI): Washington, D.C.
This paper discusses how impact-oriented agricultural research for development systems in Africa can be better organised and managed. This involves carefully linking the agricultural research agenda with national development priorities; improving coordination, interaction, interlinkages, partnerships, and networks among system agents-that is, agricultural research institutes, extension systems, higher education institutions, farmer organizations, civil society, and the private sector-and finding innovative financing and resourcing mechanisms to support the numerous

components of the system. The paper gives centrestage to a cascading logic that links research with a wider set of actions and policies that together stimulate innovation and the achievement of higher order development goals such as food security and poverty reduction.

Mur, R. and Nederlof, E.S. (In preparation). Research, Platforms and Innovation. Royal Tropical Institute (KIT): the Netherlands.
Based on an institutional history of RIU's experience of innovation platforms. Good practical details of what innovation platforms look like in practice, including challenges and limitations. Case studies are all from Africa.

Nederlof, E.S. and Pyburn, R. (eds.) (2012). One finger cannot lift a rock: Facilitating innovation platforms to trigger institutional change in West Africa. Royal Tropical Institute (KIT): the Netherlands.
A practical guide to using innovation platform-type arrangments. The intro to the book states…….
"The research programme Convergence of Sciences – Strengthening Agricultural Innovation Systems in Ghana, Mali and Benin (CoS-SIS) explores and experiments with new pathways for agricultural innovation. It has put in place innovation platforms – referred to as "Concertation and Innovation Groups" (CIGs) – for a variety of sectors: water management and rice, oil palm and cotton in Benin; oil palm, cocoa and food security in Ghana; and crops and livestock, water management and shea in Mali. The programme aims to enhance institutional change through these CIGs. In this book, West African research associates from the CoS-SIS programme describe how they initiated innovation platforms and facilitated the different steps in a CIG cycle."

Nederlof, S., Wongtschowski, M and van der Lee, F. (eds.) (2012). Putting Heads Together: Agricultural Innovation Platforms in Practice. Royal Tropical Institute (KIT): the Netherlands.
Based on a writeshop with innovation platform practitioners. Provides firsthand accounts of the practice of establishing and using innovation platforms. Has a good summary table of the dos and don'ts of innovation platforms. Case studies are all from Africa.

T.S. Vamsidhar Reddy, Andy Hall and Rasheed Sulaiman V. (Forthcoming 2012). Locating Research in Agricultural Innovation Trajectories: Evidence and Implications from Empirical Cases from South Asia. Science and Public Policy**.**
This paper sets out the idea of innovation trajectories as a way of understanding the different roles of research on the path to innovation. It makes the argument that the composition of project teams will differ at different points along the trajectory and that this has implications for the types of organisations that take a leadership role at different points in time.

World Bank (2006). Enhancing Agricultural Innovation: How to go beyond the Strengthening of Research Systems**. Economic Sector Work Report. The World Bank: Washington, DC, pp. 149.**
The book explains how innovation systems ideas can be used to identify a range of interventions beyond research that can help stimulate and enable innovation. Its purpose is to show what things can be done to add value to research for innovation. A key section of the book presents a diagram that contrasts orchestrated innovation trajectories led by research and opportunity-driven innovation trajectories led by entrepreneurs. One of the book's key messages is about the way research (and other interventions) can be used to help opportunity-driven innovation trajectories that get stuck.

Annex 7

CSIRO-CORAF/WECARD PORTFOLIO REVIEW

A portfolio review looks at the expected performance of a set of investments over various time periods. The balance of assets in a portfolio is often diversified to balance goals of growth, security of assets, and the trade-off short-term versus long-term income gains. The analogical reasoning can be applied to the CSIRO-CORAF/WECARD Partnership, as long as it is adapted properly to the case of an investment that includes the establishment of a partnership with the intention to do research for development. In this case, CSIRO (AusAID) is investing in both a partnership with a regional organisation and six specific projects negotiated with CORAF/WECARD. This early review provides an opportunity for CSIRO and CORAF/WECARD to review and revise (if needed) their investment portfolio. This section looks at the six program investments and the balance with respect to the goals of the Partnership. Since the Partnership is aligned with CORAF/WECARD's goals, its goals may be aligned with important "results" or "intermediate outcomes" of CORAF/WECARD. [The program logic is discussed in Section 2.2.

The Program consists of two commissioned projects and four competitively funded projects as follows:

1. "WECATIC": Assessment of emerging livestock ticks and tick-borne disease threats and integrated control strategies in West and Central Africa (commissioned)
2. "Seed systems": Strengthening seed systems research and development (commissioned)
3. CerLiveTrees: An integrated cereal-livestock-Tree system for the sustainable use of land and improved living conditions of small farmers in the Sahel (competitively funded)
4. "APESS": Sustainable intensification of integrated crop-livestock systems to increase agro-pastoral productivity and food security in West and Central Africa (competitively funded)
5. "Ecological Intensification": Options for ecological intensification and management of risk in integrated agro-sylvo-pastoral systems in West Africa to increase food security (competitively funded)
6. "Small ruminants": Intensification of Integrated Crop-Small Ruminant production Systems in West Africa (competitively funded)

Even in programs that make extensive use of competitive funding for transparency and quality assurance, it is often desirable to have some commissioned projects to fill gaps in coverage, start new initiatives or ensure long-term support to high priority areas. CORAF/WECARD documents[10] demonstrate that commissioned projects were strongly reviewed and some desired components were not approved because of lack of clarity on several points and lack of advancement in bringing a concept note to the stage where it could be sent back for a full proposal. This indicates that rigour has been applied in approving commissioned proposals. It may, however, be necessary to commission future work that builds synergies in the program as a whole in a way that cannot be met most efficiently through competitive calls.

[10] CORAF/WECARD. (2010) AusAID/CSIRO-CORAF/WECARD Partnership Report, April-October 2010: Phase 1 Achievements.

During the course of the review, the Team became aware of the many, and sometimes conflicting, expectations that existed on the parts of stakeholders: 1) a strengthened partnership, 2) good science, 3) salient research, 4) participatory processes, 5) operationalisation of IAR4D, 6) new knowledge, and 7) application of knowledge (i.e., innovations) that have an impact on food security. Some of these are inputs; some are application of principles; some are intermediate outcomes of IAR4D; and others may demonstrate impact on food security on an experimental group or invite scaling up and scaling out.

We have attempted to provide a succinct statement about each of the projects and its attributes that contribute to its saliency, quality of research, contribution to partnership objectives and medium term challenges and opportunities. Of particular interest is the potential to contribute to food security objectives in the near term and at a scale that is important.

SEED SYSTEMS: Lead Organisation IER, Mali

The project has the ambitious goal of finding the ways and means of establishing efficient and sustainable seed systems of staple crops — a goal that has been attempted by every major aid donor and international organisation during the last 40 years. The principles of IAR4D are applied as a port of entry to develop a "prospectus for effective seed, input and knowledge delivery". A diagnostic survey questionnaire to identify constraints and opportunities for farmers' access to improved seeds was designed with CSIRO input and results are coming out. Mother and baby trials are an effective method of participatory research (Snapp)[11] and project research has "confirmed the value of HYV and expect that best bet intercropping systems and rotations will be rapidly discovered". CSIRO also helped national teams and NARS researchers to understand the research protocols, soil sampling methods and data type needed to be collected for crop modeling purposes. From their initial experiences, the project team has identified the pathways to impact lie in enhanced knowledge: technical, economic, farmer management and capacity to choose and manage varieties. They have noted gender differences in cropping choices but not come to any major conclusions. In a more systemic vein, they observed that systems needs a "driver"…some value chain that leads to a profitable final market that will remunerate farmers who buy improved seed and thus ensure the production, processing, marketing and distribution of such seed.

The broad title may have been chosen with a view to launching a program of studies with a number of coordinated projects. Every NARS has a seed program, the international centres are active and AGRA is contributing to staple crops across the whole value chain. Recognising that for staple crops the largest share of the seed system is based in social networks, the IER (Bamako) has carried out interesting research on modelling the farmer seed system for *in situ* conservation of sorghum varieties[12]. The international centres have developed methodologies for studying seed deployment in their mandated crops (e.g., Tahiou et al of IITA with respect to maize[13] and the ICRISAT groundnut study). There is room for CSIRO and CORAF/WECARD to decide jointly how to link this project to ongoing efforts and, through applying IAR4D to seed systems more generally, add value to the research of the region.

[1111] Snapp. S. Quantifying Farmer Evaluation of Technologies: the Mother and Baby Trial Design.
[12] Bazille, D et al. (2005) Perspectives of modelling the farmer seed system for *in situ* conservation of sorghum varieties in Mali.
[13] Tahirou, Abdouaye, Danial Sanogo, A. Langyintuo, S. A Bamire and A. Olanrewaju. Assessing the constraints affecting production and deployment of maize and o seed in DTMA countries of West Africa.

WECATIC: Lead Organisation: CIRDES

The project aims to improve the control of the two most important tick species affecting animal production in West Africa, Boophilus microplus (Bm) and Amblyomma variegatum. The first is an invasive species imported from Brazil and moving upward from Cote d'Ivoire and Benin. The contribution of livestock to the economy is generally undervalued and the damage caused by ticks to productivity and livelihoods is in need of study. WECATIC, therefore, addresses an important problem of regional dimensions that causes direct losses to poor livestock producers. It is a highly salient problem with food security and livelihood implications at both the micro and macro level. The project aims to "find an integrated tick control approach to give answers to farmers' needs" (trip handout). The expected results are: 1) establishing the distribution and risk of Rhipicephalus microplus (Bm) in WCA; 2) controlling and managing tick acaricide resistance and acaricide quality control; 3) identifying factors of footbath acceptability in farming systems; and 4) capitalising on popularising tick control strategies.

CIRDES uses up-to-date LI-COR[14] technology for identifying Bm through genotyping (which reduces errors common in microscopic identification). All samples are sent to CIRDES. Other researchers in the region are pioneering the use of smart phone applications to facilitate geo-referenced data reporting and processing. This innovative use of technology accurately and quickly establishes the spread of the vector[15]. The second logical step is to verify if there is indeed acaricide resistance in Bm or merely poor application by pastoralists. CIRDES has facilities for this as well. An innovation platform brings in the private sector (pesticide dealers), veterinary services, and stakeholder groups. An integrated tick control strategy could involve action on several fronts: controls on transhumance, the search for new acaricides (or supplements to be added), better application practices by herders. Its innovation platform at Niangoloko exists for "information sharing" but could play more significant roles when knowledge passes into action.

The project is led by CIRDES (a regional centre) and, therefore, consistent with CSIRO's strategy of engaging WCA through its regional organisations. It brings collaboration with France (particularly on the Cote d'Ivoire- Burkina Faso axis) and with programs in supported by Belgium and Switzerland in other countries. The Review Team will want to examine, during the BecA review, the possible synergies between CSIRO's partnership with BecA and CORAF/WECARD's West and Central African activities as discussed in the April 2010 partnership report.

CerLiveTrees: Lead Organisation: INRAN

CerLiveTrees involves five countries (Burkina Faso, Cameroon, Mali, Niger and Senegal and three international centres (ICRAF, ILRI and ICRISAT) in the search for "an integrated cereals-livestock-trees system for sustainable land use and improvement of smallholder farmers in West and Central Africa". The search is for intensification and diversification "options" that meet the livelihood strategies and available resources of farmers in a period of climate change. Both the problem and a spontaneous re-greening of the Sahel have been going on for some time.

Activities are on track. Sensitisation workshops at the community level prepared people for the PRA and household survey. The annual report admits that IAR4D has

[14] LI-COR automated DNA sequencers were the primary systems used by Genoscope, the French National Sequencing Center to sequence chromosome 14 of the Human Genome Project.

[15] Belgian Earth Observation Platform. Assessing ecological suitability for the spread of Rhipicephalus microplus in West Africa (http://eo.belspo.be)

not yet been a major factor in structuring the research. “As we have not yet installed the IPs, we are not able to report on this aspect yet” is an indication that IAR4D remains poorly understood. Activities in all countries began with participatory rural appraisal to help guide activities while data analysis was in progress. The PRA was stratified across rainfall gradients and levels of wealth of farmers.

Various modeling approaches were put forward to predict improvement: WaNuLCAS (Water, Nutrient and Light Capture in Agroforestry Systems, from ICRAF) and APSIM (**A**gricultural **P**roduction **S**ystem S**IM**ulator)[16], from CSIRO. In Niger, project implementation sites were characterised and selected. Innovation platform members were identified who would collect data to be used for modeling purposes.

Through innovation platforms, the project may enhance the capacity of farmers to organise and to participate in decisions about technologies to be tested. The Review Team did not examine the survey instruments so it was not able to verify the statement that “all activities are based on sound social analysis”, which suggests a level of analysis and discussion that is not evident from documents provided. The re-greening of the Sahel is going on and this project offers the chance to understand the physical, social and institutional dimensions of it. Intensification also involves social differentiation that may escape the eye of the modeller[17]. The IP will be one place where such things as tree ownership, “a driving force in the success” of intensification, can be discussed. However, policy action will depend on a higher order platform — and a forum for sharing issues regionally may be an opportunity for CORAF/WECARD to raise its profile.

The project should generate valuable information for the understanding of the processes that are underway in the region. The project will want to turn this new knowledge and information into guidance for policy makers while working

Sustainable Intensification: Lead Organisation: APESS[18]

The subject matter is salient. Sustainable intensification of integrated agriculture-livestock systems addresses a key issue in managing the transition of the Sahel and the co-existence of mixed farming models with transhumance in a time of climate change. The Project estimates that 60% of households are food insecure. Its premise is that livestock makes ecological sense and that transhumance has its place alongside mixed farming.

The project identifies an increase in biomass as the entry point and lever to achieve sustainable intensification of integrated agriculture-livestock production, increase in agricultural productivity and food security. It identifies the well-known sources of increased biomass: crop residue, pastures and rangelands, forage crops, seeding under canopy, soil and water conservation, and animals. The project has some long-term targets in mind, of which one is the universal practice of zero or minimum tillage.

APESS, as an association of livestock producers, brings both policy savvy and contacts to translate the results of the research into action. It is effectively an “innovation platform” that operates at the policy level. APESS works with ECOWAS on a charter of rights for nomadic pastoralists and cooperates with ROPPA, its

[16] Keating, B et al. 2003. An Overview of APSI, a model designed for farming systems integration. European J. Agronomy.
[17] Gray, Leslie C. 2004 What kind of intensification? Agricultural practice, soil fertility, and socioeconomic differentiation in rural Burkina Faso. The Geographical Journal.
[18] Association for the Promotion of Livestock in the Sahel and Savannah (APESS)

equivalent organisation of Farmers in the region. Participants in the program have nominally committed to IAR4D but the notion of innovation platforms as learning platforms at multiple levels still has to be understood.

Like the other farming systems projects its approach has been to establish the baseline information on production systems. The diagnostic study is mostly completed. Its activities have concentrated on workshops, sensitisation and training in project methodology. In the medium term, the project expects to demonstrate the ability to regenerate degraded lands through practices that reflect livelihood strategies of mixed crop-livestock farmers.

The baseline studies have noted that women have low participation in value chains with high value-added. While the sample is too limited to support policy recommendations, it can heighten awareness of gender issues for future research planning. Their publications to date (Annual Report, Annex 1) are informative but there are no major innovations or breakthrough discoveries. Development is a long-term business.

APESS seems to have its way forward under control: With co-financing from the Swiss Agency for Development and Cooperation (SDC), it will establish the food security situation of family farms and create a Scientific Council to monitor them. In addition, it will set up animal feeding tests and tests of corn growth promoters with the private sector. It is thus practicing some of the partnership themes of IAR4D with concrete productivity goals in mind.

This is one of two projects that consider the production of an input (biomass or fodder) as the lever that can be pulled to promote sustainable innovation. Neither project has highlighted the "driver" that creates the "effective demand" for this biomass (input)[19]. In many parts of the region, cotton is the driver that creates the demand for animal traction, fodder, and increased productivity in staple foods so that farmers can devote more land and labor to cotton.

"Ecological Intensification": Lead Organisation: INERA, Burkina Faso
The project seeks improved food security through sustainable productivity increases in agro-sylvo-pastoral systems in Burkina Faso, Mali, Niger and Senegal. The three elements of its approach are: 1) modeling options for sustainable intensification, 2) applying IAR4D, and 3) value chain analysis. It sees multi- stakeholder partnerships in innovation platforms as a means of generating knowledge in technical areas of soil fertility, improving crop and livestock production, and efficient management of natural resources. The "innovation platform" basically organises actors in a value chain. Stakeholder workshops, selection of country teams and training in IAR4D, M&E and modeling was carried out by CORAF/WECARD. The database structure was prepared by CIRAD.

Key findings relating to the methodology are: 1) implementing IPs is a complex business and needs more skill; 2) obtaining comparable data across sites requires clear procedures, 3) women operate on marginal land and it is necessary to have them specially represented in IPs, 4) land tenure is a major problem, and 5) some problems can be solved by interacting with other projects. IAR4D seems to be conflated with "innovation platforms" that operate along individual commodity chains. This indicates that IAR4D still needs to be clarified and made operational.

[19] "Effective demand" means that someone is willing to pay for that product. In the case of "biomass", there may be a need for it but unless someone will pay for it, there will be no supply.

The training in simulation models (IAT, APSIM and LIVESIM) allows researchers to simulate and evaluate the impact of intensification options. The next step is to link such information to decision-making. The trend everywhere is towards increased use of crop residues. Unlike the other "farming systems" projects, which see increased biomass or fodder as a lever, this one has recognised that to "increase production without a market is madness" and, therefore, looks for a "driver" that increases the effective demand for use of biomass. There is a large body of CIRAD literature (in French) that needs to be assimilated to understand their use of "ecological intensification" based on modeling.[20] CIRAD values the CSIRO model and recognises that each model has its advantages and disadvantages.

The issue of land tenure is ubiquitous and it has the link to gender that needs to be addressed. The other land issue is that of access to common resources by adjacent villages of semi-sedentary herders and settled farmers. CIRAD researchers have worked on "chartes de territoire" and "conventions locales" which are part of the decentralisation of governance and an effective way of dealing with local disputes[21]. Bechir (2009) has described "A collaborative management platform for land and resources: lessons drawn from methods used in the savannah region of Central Africa". His conclusion needs to be highlighted: "It takes time to implement a project for the participatory management of a resource used by various users, if lasting positive results are to be achieved."[22]

Crops/Small Ruminants: Lead Organisation: CSIR, Ghana

The full title of this project is "Sustainable intensification of Integrated Crop-Small Ruminant Production Systems in West Africa". It operates in Ghana, Gambia, Benin and Mali. The project identifies two pervasive problems in the crop-small ruminant value chain: low soil fertility for crops and poor feed quality for animals. It argues that introduction of dual purpose (seed/forage) legumes into farming system will address both problems within the constraints experienced by smallholder farmers and, in particular, women farmers.

The project is highly relevant and has the potential to improve the incomes of small holders. Its stated concern for women and search for natural solutions to the soil fertility and fodder problems is well targeted. From the written accounts the decision to focus on dual purpose legumes was taken after consultation. This may be an unfortunate place to start. FAO studies have concluded that the cultivation of legumes may be hindered by the limited quantity of affordable seed. The demand for improved legume forage is limited by the demand for small ruminants — and the small scale, ad hoc sales of sheep and goals limit the demand. Work is needed on the processing and marketing end of the value chain[23]. There has been difficulty experienced with the production and purchase of legume seed (Result 3).

The project (or associated Australian support) contributes to more basic capacity development and strategic research. Result 4 includes an experiment in soil water

[20] Vall, E., Mahamadou KOUTOU et al (2012). Partenariat, modelisation, experimentation : quelles lecons pour la conception de l'innovation et l'intensification ecologique. Actes du seminaire ASAP. Nov 2011, Bobo-Dioulasso.
[21] Bonnet, B. 2003. Chartes de territoire et conventions locales: vers un renforcement de la gouvernance locale des ressources naturelles.
[22] Bechir, Ali Brahim, Moussa Aboubakar et al. .2009. Une plate forme de gestion concertee de l'espace et des ressources. In Actes du colloque : Savanes africaines en developpement : innover pour durer. Garoua, Cameroun.
[23] R.M. Nnwe. Strategies for matching feed resources to small ruminant needs: A review. (http://www.fao.wairdocs/ilri/x5520b/x5520b0y.htm)

and nitrate monitoring. A local scientist is being trained to carry out such basic studies that are increasingly affordable with new technology. The knowledge gained may in future feed into models useful for crop selection on soils of different types. The research is methodological and designed to show the utility of the technique. This is an investment with a long run vision. The training of a PhD student in Australia is another long-run investment that will bring returns after the conclusion of the project.
The Review Team is aware of the need to demonstrate "impact" on food security but comes back to the point that we are reviewing a research partnership that joins a research organisation with a regional research coordinating body. The ability to move research from the knowledge generation end to the innovation end of the continuum is a researchable topic in its own right.

An Overview of the Portfolio
Although there was no standardised information collection that compares the six projects in the Partnership portfolio, the review team has tried to capture some essential differences among them. In doing so, it may highlight the differing contributions in nature of work, potential breadth of impact and time frame for food security outcomes.

All projects address important problems. One of those problems, seed systems, has been around for a long time and has been addressed by many other donors; the tick problem is emerging rapidly throughout the region; while the natural resources problems are evolving at varying speeds due to different drivers.

The potential for the Partnership Program to bring about innovation and impacts on food security depends on whether its attack on the problem is significant, was planned in an IAR4D framework and entered at the right point. The generation of new knowledge about a problem may save time, money and prevent losses while applying old knowledge may exacerbate a problem. Some of the projects generate local solutions with few regional spillovers; others may generate solutions at multiple levels. Table 1 in the main report is at best a heuristic device to initiate discussion of problems, research responses, systems solutions and time frames.

Annex 8

FIGURE 2: CORAF/WECARD-CSIRO PARTNERSHIP LOGIC