

A REVIEW OF SELECTED MULTI-COUNTRY AGRICULTURAL
AND NATURAL RESOURCES MANAGEMENT RESEARCH
PROGRAMMES AND PROJECTS IN AFRICA:
LESSONS FOR THE FUTURE



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The terminology ‘users of knowledge’ is used to designate the many scientists, farmers, NGOs, government extension workers, policy makers, members of the private sector and Africa’s development partners who designed and carried out the various projects that we reviewed.

The team owes a debt of gratitude to the following scientists who were interviewed:

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The FARA concept is rooted in a learning culture. Being able to learn from the past experiences of its stakeholders gives it confidence in its programmes going forward. In this regard FARA is indeed fortunate to have such strength and depth in the diversity of its stakeholders which include the subregional organisations (ASARECA, CORAF/WECARD, NASRO and SADC-FANR), national, regional and international agricultural research institutions, farmers' organisations, universities, private sector, NGOs, and development partners. This is a unique and invaluable resource from which to learn about the successes and failures of multi-country agricultural and natural resources management research programmes and projects in Africa.

Multi-country agricultural research programmes have been supported by a variety of donors and in particular by the members of the Consultative Group on International Agricultural Research (CGIAR) through their 15 international agricultural research centres, four of which are based in Africa. The CGIAR has invested in commodity research as well as in eco-regional and system-wide programmes that span several countries.

Consultations with FARA's stakeholders have led to the FARA Secretariat's involvement in a number of region-wide initiatives including the Sub Saharan Africa Challenge Programme (SSA CP), the Regional Agricultural Information and Learning System (RAILS), the Dissemination of New Agricultural Technologies in Africa (DONATA) and the Strengthening Capacity for Agricultural Research and Development in Africa (SCARDA). These programmes are all committed to learning including about how best to implement programmes that span country and sub-regional boundaries.

FARA's Executive Committee and management is concerned that these lessons should not only be captured and analysed but that the analyses should be augmented by lessons learnt by other multi-country projects. This study was therefore commissioned by the FARA Secretariat to take stock of what worked and what did not in past multi-country agricultural research programmes and to interpret the lessons in the context of the rapid changes happening in African agricultural research and development including the progress of AU-NEPAD's Comprehensive Africa Agriculture Development Programme (CAADP), the Framework for African Agricultural Productivity (FAAP) and the new Strategic Plans of FARA and the SROs. This report is timely in view of the renewed interests of African governments and the international community in investing in African agriculture and the imperative for getting the best possible returns to this rare opportunity. FARA hopes that the best-practices and pitfalls identified in this study of past efforts will be helpful, not only to those involved in FARA's region-wide initiatives, but also to others charged with designing and implementing future multi-country agricultural research programmes and projects.

African agriculture is characterised by a high degree of social, market and environmental diversity which calls for innovations that are adapted to specific contexts. Within any one country there can be many ecozones criss-crossed by communities with different social and market characteristics and, especially in the smaller countries, it is difficult to find sufficient human, physical and financial resources to cater to each of those circumstances.

However, there are opportunities for collaboration and task sharing to make best use of the limited resources because social and ecological circumstances extend well beyond national boundaries. The rationale that a regional approach would best address issues that cut across national boundaries resulted in the establishment, in Africa, of four sub-regional organisations (SROs). These are the Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA), Conseil Ouest et Centrale Africain pour la Recherche et le Développement Agricoles/West and Central African Council for Agricultural Research and Development (CORAF/WECARD), the North Africa Sub-Regional Organisation (NASRO) and the Southern African Development Community Food Agriculture and Natural Resources Directorate (SADC-FANR). This potential value addition to be gained from sharing experiences, lessons and best practices across the continent was also a cardinal justification for establishing the Forum for Agricultural Research in Africa (FARA).

In sub-Saharan Africa, a number of different approaches have been adopted to capture the advantages of multi-country collaboration in agriculture and natural resource management (NRM) research to address common problems. Each new approach promised greater impact in improving and securing livelihoods. However, there is little hard evidence that each new approach did in fact profit from earlier lessons. Although each had its advantages, the expected benefits from the successful planning, the combination of resources, the building of greater critical mass and the ability to test the successful approach under contrasting political, social, economic, technical and environmental circumstances have not materialised.

In order to break out of this mould, FARA commissioned this review of past (and ongoing) multi-country agricultural and NRM programmes and projects to enable lessons to be learnt about what works and what does not work well in promoting agricultural innovation. These lessons can then be applied to the design of future agricultural research for development (AR4D) projects and programmes. This review will enable FARA's stakeholders, who are the promoters and actors in multi-country agricultural and NRM projects, to generate better returns to their investments.

In developing a framework for the review of the projects, the ‘impact pathway’ approach was adopted to see how the research process has resulted in changes in behaviour of the many stakeholders. A questionnaire was designed to cover the various stages involved in the impact pathway approach. These stages included:

- Project conception and planning
- Research inputs
- The research process
- Research outputs
- The innovation process
- Research outcomes and impact

To identify projects that could be included in the study, a letter was sent to key informants requesting information on programmes and projects that fulfilled the multi-country criteria.

Sixty-two (62) questionnaires were sent to organisations operating in the four SROs in Africa. Thirty-two (32) valid responses were received from organisations working in three of the four sub-regions (ASARECA, CORAF/WECARD and SADC). There were no responses from the North Africa sub-region (NASRO). Of these responses, 21 were on NRM and 11 dealt with commodity research. Twenty-two (22) projects were carried out by international agricultural research centres (IARCs). The preliminary analysis of the results, was supplemented by face-to-face interviews and discussions with 15 respondents.

Analysis of the data revealed that for the majority of projects, the innovation systems approach had been adopted. At project conception, farmers, government extension workers, non-governmental organisations (NGOs), policy makers and other researchers who might contribute to the objectives of the project were identified as users of knowledge (UoK) by more than 70% of the projects. The value of a monitoring and evaluation (M&E) plan was acknowledged by the majority of projects (78%) and more than half of the respondents indicated that the M&E plan was designed at the problem definition stage.

It seemed to us that achieving the project’s outputs such as agricultural practices, technologies, methods and tools was equated to achieving the goal of the project. Incidentally, no project referred to poverty reduction as a goal.

All the projects examined had been funded by Africa’s development partners. It would appear that this dependence on external sources of funding affected the timelines for the projects. The majority of projects (58.6%) were planned to last no more than 3 years.

While the scientists within the IARCs and the national agricultural research systems (NARS) worked within a networking mode, quite significantly, farmers and farmers’ organisations were not considered to be important participants in the research process. Scientists at lead and partner institutions dominated the planning, reviewing, approval and monitoring of research plans and activities. In the same vein, the researchers again dominated the planning, reviewing and approval of and access to the details of the financial plans. In spite of this anomaly, almost all respondents (90%) indicated that feedback was obtained from the UoK at least once a year.

While most respondents felt that the project outputs met the needs of farmers, NGOs and other scientists ‘very effectively’ or ‘effectively’, outputs received by the private sector and the policy makers were generally less effective.

A major reason for the face-to-face interviews was to gain some insight into how research can be improved *as a process*. These interviews allowed us to share some of the ‘joys and pains’ of the scientists as they carried out the trials. It became clear that in spite of the complex nature of multi-country projects, their value is immeasurable. The following is a summary of the advantages listed by the scientists:

- Achievement of economies of scale and efficiency in research and development by concentrating scarce human, financial and other resources on key national and regional problems
- Increased bargaining power with external partners
- Helps to minimise duplication
- Promotes exchange of information and the combination of collective experience of professionals in the same field
- Promotes collaborative research through network experiments
- Promotes joint capacity building
- Promotes capture of research and development spill-over/spill-in effects
- Enables rationalisation of human resource development
- Facilitates mobilisation of research efforts on transnational problems that require collaboration between countries
- Promotes exploitation of a larger market for agricultural research technologies through regional collaboration
- Regional collaboration can lead to faster demonstration of impact despite declining investment in agricultural research and development
- Increases the chances of achieving lower transaction costs
- Can facilitate better and more access by all stakeholders to available technologies at regional and international levels

The findings of this review led to the following recommendations:

Recommendation 1: Because of the advantages of multi-country programmes and projects, FARA should promote such projects as a mechanism for carrying out research by African countries. The SROs should be strengthened to play the lead role in this process with the Consultative Group on International Agricultural Research (CGIAR) centres playing a backstopping role.

Recommendation 2: The relationship between the SROs, existing CGIAR research centres with sub-regional mandates and sub-regional economic communities should be strengthened. Inclusion of the sub-regional economic bodies in decision making in regional agricultural research and development might broaden the appeal of agricultural research to both local policy makers and entrepreneurs and increase the local funding base for the regional and national agricultural research institutions.

Recommendation 3: In carrying out multi-country programmes and projects, the number of planning meetings and workshops should be held to a minimum. Tasks and roles of partners should be defined early in the planning process.

Recommendation 4: Donors should be more involved as part of the UoK during the project conception phase. A clear understanding of the nature of the project, the priorities identified by all UoK and the goal (outcomes and impact) of the project would help the donor decide how to fund the project and effectively monitor performance.

Recommendation 5: If multi-country NRM programmes and projects are to generate outcomes and impact, FARA and the SROs should seek longer-term funding for such programmes and projects.

Recommendation 6: In line with the poverty reduction strategy papers (PRSPs) of African governments, the mission and goals of the CGIAR and the Millennium Development Goals (MDGs), poverty reduction should be the goal of multi-country agricultural and NRM programmes and projects.

Recommendation 7: A stronger involvement of policy makers, especially at the local level, at the problem definition and priority setting stage, is highly encouraged. Scientists should learn to use local leaders such as village chiefs as advocates to promote the goals of their projects. This, in addition to stronger partnerships between regional economic communities (RECs), national governments, local government officials and donors, will constitute a formidable base for supporting AR4D. Without local support, the sustainability of NRM research will be hard to attain.

Recommendation 8: In all matters relating to the projects, scientists and their institutions must be transparent and accountable to all UoK. Scientists must attempt to get out of the habit of ascribing failure to generate noticeable impact to unwarranted assumptions concerning the likely adoption of research results. For example, scientists should not assume that there will be an effective extension service to disseminate results or that farmers will invest their scarce capital in new technologies. Developing the right partnerships at project conception and planning will ensure that all decisions relating to the conduct and management of the research enhance the likely adoption of the research results.

Recommendation 9: There should be a shift of emphasis from the farmer to the consumer as end user or ultimate beneficiary of agricultural and NRM research projects, in the value chain context, and further recommend that the design of single or multi-country projects should reflect this fact. FARA is urged to initiate debate and dialogue on this matter.

1.1. Background

African agriculture is characterised by a high degree of social, market and environmental diversity which calls for innovations that are adapted to specific contexts. Within any one country there can be many ecozones criss-crossed by communities with different social and market characteristics and, especially in the smaller countries, it is difficult to find sufficient human, physical and financial resources to cater to each of those circumstances.

However, there are opportunities for collaboration and task sharing to make best use of the limited resources because social and ecological circumstances extend well beyond national boundaries. The subhumid zone, for example, extends from the Casamance in Senegal across to eastern Africa and south to Mozambique. Ethnic groups with similar social structures and norms can similarly be found on both sides of national borders. The agricultural market systems are interlinked by trade routes that can extend across several countries. And diseases, pests and weather patterns have no respect for national boundaries.

In these circumstances there should be much to gain from intra-African collaboration in agricultural and natural resource management (NRM) research. This recognition motivated the establishment of international agricultural research centres (IARCs) with 'ecoregional' mandates. The first of these centres was the International Institute of Tropical Agriculture (IITA) which was established as a regional centre by Ford Foundation and The Rockefeller Foundation in 1967. It subsequently became one of the first four founding centres of the Consultative Group on International Agricultural Research (CGIAR) with a mandate to conduct research on agricultural production systems in the low altitude humid tropics of Africa. Four of these CGIAR centres are today located in sub-Saharan Africa. In addition to promoting collaboration within the centres, the CGIAR system promotes collaboration with stakeholders outside the system such as the national agricultural research systems (NARS). As revealed by this review, these CGIAR centres have played a pivotal role in the design and implementation of multi-country research projects and programmes in sub-Saharan Africa. Advantages from intra-African collaboration also led to the creation of other regional or sub-regional centres such as Centre Internationale de Recherche-Développement sur L'Élevage en zone Subhumide (CIRDES), the International Trypanotolerance Centre (ITC) and the West African Rice Development Association (WARDA) now called the Africa Rice Centre. The International Centre of Insect Physiology and Ecology (ICIPE) has a continental mandate.

In 2000, the CGIAR adopted a new vision and strategy. To implement the new vision, the system endorsed an integrated strategy of seven planks (TAC 2000)¹¹. Plank 4 dealt with a 'Regional approach to research' and called for the adoption by the CGIAR, in collaboration with its regional and national partners, of a regional approach to research planning, priority setting and implementation. This would better address the heterogeneous nature of the causes of poverty and food insecurity in different regions while integrating these priorities with global priorities in international agricultural research. This approach lent credence to the rationale for the establishment of the sub-regional organisations (SROs): the Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA), Conseil Ouest et Centrale Africain pour la Recherche et le Développement Agricoles/West and Central African Council for Agricultural Research and Development (CORAF/WECARD) and the Southern African Development Community Food Agriculture and Natural Resources Directorate (SADC-FANR). These were created to stimulate member country organisations to develop national plans that would form the basis for sub-regional strategic plans. The potential value addition to be gained from sharing experiences, lessons and best practices across the continent that motivated the initiatives indicated above is also a cardinal justification for establishing the Forum for Agricultural Research in Africa (FARA). FARA has responded to the potential benefits by spearheading the development of the Framework for African Agricultural Productivity (FAAP) and five continental programmes: the Sub Saharan Africa Challenge Programme (SSA CP), Dissemination of New Agricultural Technologies in Africa (DONATA), Strengthening Capacity for Agricultural Research and Development in Africa (SCARDA) and Building African Scientific and Institutional Capacity (BASIC), the Regional Agricultural Information and Learning System (RAILS) and the African Biotechnology and Biosafety Platform (ABBP).

1.2. Objectives

There have always been individuals and organisations that instinctively knew that achieving impact requires actions along the entire value chain. The Green Revolution (Borlaug 1970¹²) would not have happened if Dr Norman Borlaug had confined himself to plant breeding. His success at getting support for action at all levels of government, from Heads of State down, for the provision of seeds, fertilisers and other inputs, was key to achieving so much impact. The Pan African Rinderpest Campaign (PARC), which took a vaccine from the research laboratories to the remotest corners of Africa overcoming all manner of policy and logistical hurdles, was another hugely successful innovation. However, the lessons from these successes have not been sufficiently internalised by the wider agricultural research and development community, especially in Africa.

In sub-Saharan Africa, a number of different approaches have been adopted to capture the advantages of multi-country collaboration in agriculture and NRM research to address common problems. Each new approach promised greater impact in improving and securing livelihoods. However, there is little hard evidence that each new approach did in fact profit from earlier lessons. The result is that their impacts have hardly been incremental and remain

11. TAC (Technical Advisory Committee). 2000. *A food secure world for all: Towards a new vision and strategy for the CGIAR*. CGIAR (Consultative Group on International Agricultural Research), Washington, DC, USA.

12. Borlaug, N. 1970. The Green Revolution, Peace and Humanity. Nobel Lecture, 11 December 1970.

disappointing. Although each new approach used in the past has had its advantages, the expected benefits from the successful planning, the combination of resources, the building of greater critical mass and the ability to test the successful approach under contrasting political, social, economic, technical and environmental circumstances have not materialised. The response to the less than satisfactory outcomes has been to try new approaches.

To break out of this mould, FARA wishes to collate the experience gained in various selected past and ongoing (where there are already significant outputs that need to be cited) multi-country programmes and projects to identify best practices and articulate lessons that will be useful to the design and management of sub-regional and continental programmes and projects. The purpose is to enable lessons to be learnt about what works and what does not work well in promoting agricultural innovation. These lessons can then be applied to the design of future agricultural research for development (AR4D) projects and programmes. This review will enable the promoters and actors in multi-country agricultural and NRM projects to generate better returns to their investments. The approach will differ from past reviews in that it will be less concerned with the merits and defects of particular projects and more concerned with drawing on numerous programmes and projects to identify common features that characterise their successes and failures.

FARA hopes to benefit from reviews of past systemwide and ecoregional programmes such as that commissioned by the CGIAR Technical Advisory Committee (TAC; TAC 1999¹³). This effort will provide FARA's stakeholders with information and analyses that will help them achieve greater impact and reduce the transaction costs of multi-country programmes and projects.

1.3. Beneficiaries of the study

This study is an attempt to gather relevant information from as many past African multi-country agricultural research projects as possible on such features as their design, research process, management and funding that enabled or constrained their efforts to achieve high-impact agricultural innovation.

FARA intends for the results of this study to be used by research and funding institutions, steering and management committees, task forces and work groups engaged in multi-country collaborative research in agriculture and NRM.

The ultimate beneficiaries will be the stakeholders of ongoing and future multi-country collaborative research in agriculture and NRM. Hopefully, they will profit from greater impact, lower transaction costs and higher savings from incorporating best practices and not having to re-learn lessons. All the region-wide initiatives or projects of FARA should therefore be the major beneficiaries.

13. TAC (Technical Advisory Committee). 1999. Report of the systemwide programs with an ecoregional approach. CGIAR (Consultative Group on International Agricultural Research), Washington, DC, USA.

In the 1960s and 1970s, the Food and Agriculture Organization of the United Nations (FAO) provided support for fertiliser research in many countries in sub-Saharan Africa as part of the Freedom from Hunger Campaign.⁴ The results obtained in the various environments even for the same crop pointed to the complexity of farming environments in Africa. The establishment of IITA in 1967 was an effort to better understand the complex farming systems of the humid tropics of Africa. In the 1970s, a major step forward in understanding this complexity was the development of ‘farming systems’ research, promoted in sub-Saharan Africa by such scientists as Norman,¹¹ Abalu¹² and researchers at IITA led by Okigbo¹³. Their approach increased scientists’ understanding of the systems which scientific outputs were intended to benefit. However, the farming systems approach failed to realise its early promise and the search for new ways of doing business has since continued.

After establishing ‘ecoregional centres’, the CGIAR recognised that additional efforts were needed to maximise the transfer of knowledge gained in one location to other locations within the same climate and vegetation zone (ecoregion). This led to the establishment of multi-country/systemwide programmes with an ecoregional approach. Ecoregional programmes were established to work at the intersection between NRM and improvement of agricultural production and productivity. When the CGIAR amended its goal and mission to include poverty reduction (TAC 2000), there was an explicit link between the new mission and regional approaches to research. Accordingly, the aim of ecoregional programmes was amended to achieve a balance between better NRM, increased agricultural productivity and greater social equity in research for development. Of the ecoregional programmes set up by the CGIAR, five dealt substantially with conditions in sub-Saharan Africa (Table 1). These programmes have been the subject of several reviews and evaluations.

Henzel and his colleagues undertook the most comprehensive review of all systemwide programmes with an ecoregional approach in 1999 (TAC 1999). The report noted that although the programmes had achieved a lot, ‘the full power of the holistic ecoregional approach to research, especially its human and policy dimension, has not been fully explored.’ In terms of developing

4. Norman, D.W. 1975. Rationalizing mixed cropping under indigenous conditions. The example of Northern Nigeria. *Samaru Agricultural Bulletin* 232.
5. Abalu, G.O. 1976. A note on crop mixtures under indigenous conditions in northern Nigeria. *Journal of Development Studies* 12:212-220.
6. Okigbo, B.N. and Greenland, D.J. 1976. Intercropping in Africa. In: Sanchez, P.A., Papendick, R.I. and Triplett, G.B. (eds), *Multiple cropping*. American Society of Agronomy Special Publications 27. pp 63-101.

Table 1. Systemwide programmes set up by the CGIAR with an ecoregional approach in sub-Saharan Africa.

Ecoregional programme	Countries in sub-Saharan Africa with concentrated activity	Year started
African Highlands Initiative (AHI)	Ethiopia, Kenya, Tanzania and Uganda	1995
Inland Valley Consortium (IVC)	Benin, Burkina Faso, Cameroon, Côte d'Ivoire, Ghana, Guinea, Mali, Nigeria, Sierra Leone and Togo	1993
Desert Margins Initiative (DMI)	Burkina Faso, Mali, Niger, Kenya, Botswana, Republic of South Africa, Senegal, Zimbabwe and Namibia	1997
Alternatives to Slash-and-Burn (ASB)	Cameroon (primary site)	1992
Ecoregional Program for the Humid and Sub-humid Tropics of Sub-Saharan Africa (EPHTA)*	Cameroon, Nigeria, Sierra Leone, Liberia, Democratic Republic of the Congo	1993

* Currently not active.

partnerships with national programmes, the report noted significant progress and urged the CGIAR centres to build on this potential for the future. It is the authors' judgement that the results of this review promoted the establishment of plank 4 of the new CGIAR vision and strategy.

The four key issues raised by the review are:

- The ecoregional approach remains valid for the CGIAR and for many of its partners.
- Such research must be focused on major problems related to the sustainable improvement of productivity which are of international relevance.
- Procedures for monitoring progress and performance indicators were found to be lacking in many programmes. Timetables and 'sunset' clauses were also missing.
- Programme governance was not well defined in most programmes.

In its comments on the report, TAC noted that the ecoregional approach must explicitly take into account the poverty and human dimensions of problems.

In 2002, the Interim Science Council (iSC) (iSC 2002¹⁴) revisited the recommendations of the 1999 report. The iSC emphasised four points raised by TAC. Three of these are:

- Several programmes placed undue emphasis on methodologies (characterisation) rather than on the research results that would themselves lead to impact.
- TAC questioned the usefulness of the original definition of ecoregions based on zones of similar climate and natural vegetation. This approach proved not so useful in most cases. Many programmes successfully used socio-economic and agro-ecological information

14. iSC Secretariat. 2002. *Lessons learned in the implementation of systemwide programmes*. CGIAR (Consultative Group on International Agricultural Research), Washington, DC, USA.

as suggested by the identified problem. It was suggested that the term ‘ecoregion’ be dropped as a technical term.

- While suggesting that the CGIAR should drop the term ‘ecoregion’ as a technical term, TAC suggested that integrated natural resources management (INRM) be applied to circumstances in which biophysical and social/economic dimensions are combined. The term ‘multi-centre’ was suggested as a replacement for ‘systemwide’.

In 2003, Berdegue and Escobar¹⁵ undertook a meta-analysis of the reviews and evaluations of the ecoregional programmes. The analysis pointed out three major challenges facing the programmes:

- Delivery of NRM research outputs that will make a real impact on programme objectives.
- Integration of biophysical and socio-economic and policy research.
- Design and management of effective partnerships.

The meta-review concluded by noting that ecoregional programmes have made major advances in improving interaction between national programmes and CGIAR centres.

The analysis noted that few ecoregional programmes have yet documented evidence of impact. Perhaps this is the result of initial overemphasis on characterisation. The reviewers suggested that most programmes could go further in integrating the biophysical and the social sciences as research on socio-economic and policy issues have remained weak in all programmes.

The results of a desk study commissioned by the Science Council under the title ‘Meta-review of CGIAR systemwide and ecoregional programs’ (SWEPs¹⁶) was presented to the system in November 2006. The positive attributes of SWEPs were that they:

- Operate as innovative inter-institutional, multidisciplinary networks and consortia.
- Facilitate collaboration through partnerships in research for development.
- Develop effective functional linkages among CGIAR centres, national agricultural research and extension systems (NARES), national agricultural research institutes (NARIs) and advanced research institutes (ARIs) that capitalise on the comparative advantages of the partners.
- Successfully apply an INRM approach.
- Help strengthen the capacity and capability of all partners in the research and development (R&D) challenge.
- Engage policy makers at various levels and influence the direction of relevant policy development.
- Are instrumental in fostering more coherent policies in the CGIAR system.
- Seek to be problem driven and outcome and impacts oriented.

15. Berdegue, J. and Escobar, G. 2003. Meta-analysis of reviews and evaluation of ecoregional programs. Report for the Science Council. CGIAR (Consultative Group on International Agricultural Research), Washington, DC, USA.

16. Bevege, I., Egger, P. and Debela, S. 2006. Meta-review of CGIAR systemwide and ecoregional programs. Report for the Science Council. CGIAR (Consultative Group on International Agricultural Research), Washington, DC, USA.

- Strengthen inter-centre collaboration.
- Adopt a balanced approach to research for development involving an appropriate mix of action planning, strategic research, action learning and capacity building.
- Promote uptake and adoption through demonstration and policy dialogue.
- Facilitate the involvement of private sector input and service providers in the technology development and dissemination process.
- Adopt the benchmark site approach, standardised/harmonised methodologies and baseline studies to enable comparative research and analysis across sites and scaling up of technologies to generate global public goods.
- Develop effective and readily accessible information exchange and knowledge systems as public goods.

The panel noted that not all these attributes apply to all programmes. However, it is clear from this report that the goal of SWEPs aligns closely with the new vision, mission and strategy of the CGIAR.

A very comprehensive review of the Alternatives to Slash-and-Burn (ASB) programme was undertaken by a team led by Bill Clark¹⁷ in 2005. In accepting the report, the Science Council noted that the review team had adopted a highly innovative method to document, in both qualitative and quantitative terms, the influence and outcomes from ASB. TAC (1999) had noted that ‘the ASB programme has gone further than the others in relating its research sites to the whole area over which the problem occurs, and in scaling up to the global level its findings on the trade-offs between carbon sequestration and biodiversity on the one hand, and agricultural productivity on the other’. Clark et al. (2005) were in total agreement with this assessment noting that ‘ASB has been highly relevant to the CGIAR’s core mission and is pursuing work well aligned with the Science Council’s recently articulated “System Priorities for 2005–2015”’. In summing up the impact of ASB, the panel noted that ‘the ASB programme has played a significant role in transforming the way that decision makers think about the factors shaping land use at forest–agriculture interfaces in the humid tropics. In so doing, it has created the world’s pre-eminent system for use-driven comparative scientific investigation of human–environment interactions at the forest margin across the pan tropic domain’. In spite of these kudos, the panel noted in Recommendation A that ‘ASB should extend its strategic planning process to include explicit identification of what knowledge outcomes and impacts it most wants to achieve with which audiences and should target its activities and resources accordingly..... It should develop a matrix of the outcomes and impacts actually achieved and regularly compare these with its objectives.’

As the data from this study will show, the majority of multi-country R&D in sub-Saharan Africa has been carried out by the CGIAR system. This review has therefore tended to concentrate on the efforts made by the system to improve the performance of multi-country projects and programmes in sub-Saharan Africa. At the risk of over simplification, the various phases that the CGIAR system has undergone might be summarised as going from involving only the researchers to involving farmers and a wider range of partnerships in

¹⁷ Clark, W. Contreras, A. and Harmsen, K. 2005. Evaluation and impact assessment of the Alternatives to Slash and Burn Programme. Report for the Science Council. CGIAR (Consultative Group for International Agricultural Research), Washington, DC, USA.

national systems including universities and non-governmental organisations (NGOs). The latest evolution is the development of challenge programmes. By means of the challenge programmes, not only are the CGIAR centres working together but the doors of collaboration have opened to the private sector and all potential partners capable of adding value to the collective effort.

Lessons from the reviews of these programmes helped the FARA team to select issues that were examined during the process of drafting the questionnaire.

3.1 Conceptual framework

3.1.1 The innovation systems context

Other industries have paid much more attention to innovation systems theory and practice than agriculture has, especially agriculture in Africa. As was noted in the review of the multi-country (systemwide) agricultural and NRM research undertaken by the CGIAR, various elements of the innovation systems approach were knowingly or unknowingly adopted. Recently, several researchers (e.g. Hall et al. 2000¹¹; Hall et al. 2001¹²; Clark 2002¹³; Hall et al. 2003¹⁴) have applied innovation systems paradigms, including information theory, to agriculture and it is now better understood and is being continuously advanced. This is exemplified by the current application of, for example, policy systems analysis in environmental management (Morriss et al. 2005¹⁵) and foresight techniques (Alan 2006¹⁶).

The SSA CP is possibly the first major agricultural research programme in sub-Saharan Africa to specifically set out to validate innovation systems approaches to AR4D. The SSA CP is addressing productivity, marketing, policies and NRM at the interfaces between these factors. In this respect research on the interactions between the factors has become as or even more important than research on the factors themselves.

11. Hall, A.J., Clark, N.G., Rasheed Sulaiman, V., Sivamohan, M.V.K and Yoganand, B. 2000. New agendas for agricultural research in developing countries: policy analysis and institutional implications. *Knowledge, Policy and Technology* 13(1):70-91.
12. Hall, A.J., Sivamohan, M.V.K., Clark, N., Taylor, S. and Bockett, G. 2001. Why research partnerships really matter: innovation theory, institutional arrangements and implications for developing new technologies for the poor. *World Development* 29(5):70-91.
13. Clark, N.G. 2001. Innovation systems, institutional change and the new knowledge market: implications for Third World agricultural development. United Nations University, Institute of New Technologies Discussion Paper 10. United Nations University, Tokyo, Japan.
14. Hall, A., Rasheed Sulaiman, V., Clark, N. and Yoganand, B. 2003. From measuring impact to learning institutional lessons: an innovation systems perspective on improving the management of international agricultural research. *Agricultural Systems* 78:213-241.
15. Morriss, S, Massey, C., Flett, R., Alpass, F. and Sligo, F. 2005. Mediating technological learning in agricultural innovation systems. *Agricultural Systems* 80:79-120.
16. Alan, N. 2006. National growth and innovation systems—Commercial best bets in agriculture using foresight. Paper presented at 5th Meeting of the Advisory Committee on Science and Technology for the ACP Agricultural & Rural Development. CTA Headquarters, Wageningen, The Netherlands.

A fundamental principle of innovations systems is that their success is correlated with the ease of access to and freedom of exchange of information between all actors along the value chain. Indeed, Clark (2004¹⁷) argues that there is a great deal of information (potential knowledge) in most economic systems but the difficulty lies in being able to identify what is relevant to any specific activity.

3.1.2 The impact pathway approach

In this study, as many multi-country projects in agriculture and NRM as feasible were examined within the context of innovation systems. Innovation is the source and driver of development and great innovators have been recognised in all aspects of agriculture. These innovators include farmers, scientists, trainers and policy makers. Such scientists as Kjeldahl¹⁸, whose work has promoted the use of inorganic fertilisers and Hammond¹⁹, who pioneered commercial artificial insemination for improving livestock productivity, have had inestimable impact.

However, such major breakthroughs, which could be picked up and fitted into the prevailing production and marketing systems, have become increasingly rare and most investment in agricultural R&D, especially in Africa, has been much less rewarding. As more so called 'successful' new technologies have accumulated on research station shelves, pressure has grown to find new ways of doing business that will have greater impact. In sub-Saharan Africa, the beneficial role of investments in agricultural research has come under intense scrutiny. In light of the CGIAR's enlarged mission and goal involving 'poverty reduction', critics have questioned whether scientific solutions developed in agricultural research stations, be they national or international, are really relevant to the rural poor.

Investment in agricultural research is usually justified by analysing its impact in some way and many complex ways have been developed for this process. Springer-Heinze et al. (2005²⁰) noted that too much emphasis on measuring impact and too little on identifying those areas in which the research process is most likely to lead to behavioural changes may partly explain why agricultural research may fail to meet expectations.

To ensure that research results in impact, it is now an accepted principle that in planning agricultural and NRM research, one should take into account such issues as 'who to work with', 'in what role' and 'how to organise interactions necessary for innovation', in the design of the project (Science Council 2005²¹). This process enables one to consider the incremental changes in relationships and behaviour that are essential when the goal of

17. Clark, N.G. 2004. Science policy and agricultural research in Africa: a capacity building needs assessment. Report to the Science and Technology Commission of NEPAD. NEPAD (New Partnership for Africa's Development), Johannesburg, South Africa.
18. Wutzke, K.D. and Heine, W. 1985. A century of Kjeldahl's nitrogen determination. *Z Med Lab Diagn* 26(7):383-388.
19. Hammond, J. 1940. *Farm animals: their breeding, growth and inheritance*. Longmans, Green & Co. New York, USA.
20. Springer-Heinze, A. 2005. *Shaping value chains for development: Practical experiences*. German Agency for International Cooperation (GTZ), Department of Agriculture, Fisheries and Food. 65726, Eschborn, Germany.
21. Science Council. 2005. Status of monitoring and evaluation of the CGIAR systemwide and ecoregional programmes. CGIAR (Consultative Group on International Agricultural Research), Washington, DC, USA.

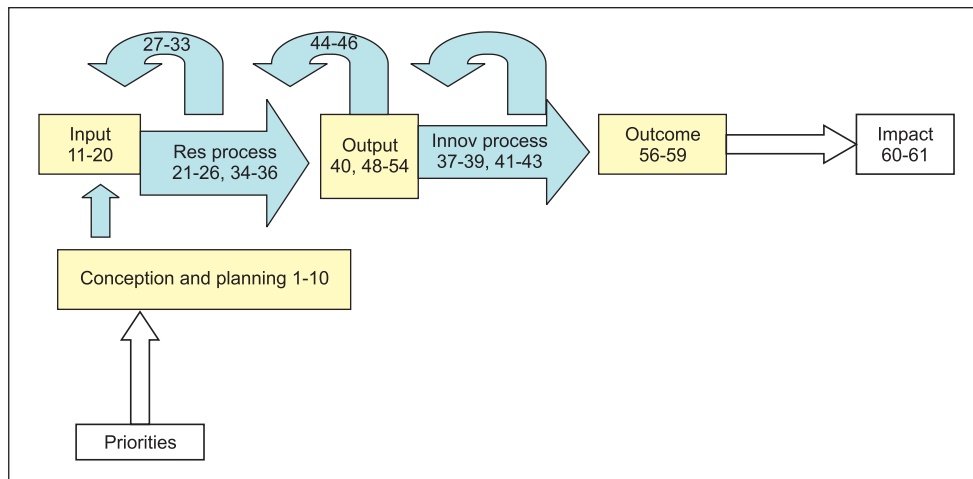


Figure 1. Conceptual framework (Note: The numbers represent questions in the questionnaire). Adapted from Hartwich and Springer-Heinze (2004).

research is ‘poverty reduction’. Under this scheme, projects have to involve the whole landscape of actors (farmers, extension service providers, policy makers, the private sector and other organisations that would disseminate the findings (boundary organisations)). The process must then include how to organise things so that these actors interact in ways that allow new ideas—including those from research—to be brought into the research process so that they address the needs of the poor. In 2000, TAC acknowledged this approach by requesting CGIAR centres to develop impact pathways for their research programmes and projects.

In reviewing past multi-country projects therefore, the ‘impact pathway’ approach was used to determine how the research process has resulted in changes in the behaviour of stakeholders. Many benefits were derived from the ‘results-based framework’ approach developed by the Canadian International Development Agency (CIDA²²) and this review adopted its version of the framework from the generic model of the research impact pathway developed by Hartwich and Springer-Heinze (2004²³).

This model (Figure 1) was agreed upon because:

1. It is widely tested and understood.
2. It can incorporate other models of innovation and agricultural change.
3. It allows ‘success’ to be measured at four levels, namely input, output, outcome and impact.
4. It clarifies the research-development boundary ideas.

22. CIDA (Canadian International Development Agency). 1996. Results-based management in CIDA: Policy Statement. <http://www.acdi-cida.gc.ca/cida>.

23. Hartwich, F. and Springer-Heinze, A. 2004. *Enhancing the impact of agricultural research: An impact pathway perspective*. ISNAR Briefing Paper. ISNAR (International Service for National Agricultural Research), The Hague, The Netherlands.

Adoption of the impact pathway approach means that the first ‘act’ is to define the priorities that would determine the objective of the project. The research process would then involve the use of inputs (e.g. information, research staff and financial resources). The processes leading to impact may be broken into three phases:

- Use of the inputs through a *research process* to generate **outputs** in accordance with the project’s priorities and objectives.
- Developing processes to deliver the outputs to beneficiaries (*innovation process*). This involves out-scaling of the outputs generated by the research process. The innovation process leads to incremental changes in relationships and behaviour of stakeholders. These incremental changes in relationships and behaviour are the **outcomes** which could include the adoption of new technologies/methods or information, (including market information) leading to increased productivity and profitability.
- Up scaling, leading to increased gross domestic product (GDP), food security, welfare and environmental sustainability, i.e. **impact**. The *agricultural development* process determines if impacts are realised. It is recognised that increased impact will depend on the existence of other factors such as good governance.

The success or failure of any agricultural or NRM research project or programme will depend on what happens or does not happen along the impact pathway. Therefore in designing the questionnaire, the emphasis was placed on actions and actors during all phases of the projects. The numbers in Figure 1 represent the questions in the questionnaire that would provide the needed information for each action and interaction. As noted by Hartwich and Springer-Heinze (2004), the impact pathway builds on a set of logical relationships that are interlinked in a chainlike manner. However, it does not imply a linear cause-and-effect contribution to impact. Therefore, questions related to the feedback loops are also designated in Figure 1.

3.2 Project selection

To determine which projects to include in the review, letters were sent to key informants requesting information on programmes and projects (either completed or ongoing but mature) that fulfilled the multi-country agricultural and NRM criteria of the review. A list of projects was drawn from the suggestions provided by the key informants. Key informants included individuals in research management positions in the four SROs in Africa, IARCs, regional agricultural institutions, international development agencies and private foundations, regional economic communities (RECs) and NGOs. Conscious efforts were made to cover all regions of Africa (East, West, Central, Southern and North Africa). The projects chosen had a commodity or NRM focus.

3.3 Survey methods

The aim of the review is to draw on as many programmes and projects as possible to identify common features in their success or failure. To this end, data collection relied on both quantitative and qualitative methods using questionnaires and key informant interviews respectively.

The questionnaire was designed to cover all the steps of the research project following the impact pathway approach: problem definition and project conception, research inputs, the

research process, the innovation process, outputs, outcomes and impact. Responses from key informants revealed that some organisations such as the NGOs and RECs were not in a position to participate since their work was developmental rather than research in nature. This knowledge determined the number of questionnaires eventually sent out. Information from the respondents formed the basis of the analysis and qualitative follow-up.

3.4 Definitions

It is essential, in the authors' view, to provide the reader with the definitions of some of the terminology used in this study:

- **Research project** is a project with an identifiable lead institute, a group of stakeholders ('users of knowledge'), outputs and outcomes.
- **Users of knowledge (UoK)** are any project stakeholders who may use or benefit from the results/information generated by the research project. UoK include farmers, NGOs and extension organisations, other researchers in the area, the private sector and policy makers and eventually the consumer.
- **Outputs** are the tangible knowledge products of research— e.g., new varieties, products, practices, policy recommendations, tools and methods. They can be packaged in many ways: in scientific papers, guides, websites, models etc.
- **Outcomes** are changes in behaviour by anyone as a result of using an output. Examples include farmers changing varieties or management practices, extension staff giving out new messages, changed policies at local, national or international level, marketers trading in new products etc.
- **Private sector** (as defined by the respondents): There was a regional difference in the way respondents defined the term 'private sector'. In East and Southern Africa where there are large estate farms owned either by individuals or corporations, the terminology was used largely to identify owners of the large commercial farms and their commercial partners. In West and Central Africa where private commercial farms are a rarity, private sector meant fertiliser and seed dealers. The scientists in East and Southern Africa felt that the commercial farms had their own research capability and therefore the urge to collaborate with scientists to help the limited resource farmers was minimal. Conversely, scientists in West and Central Africa felt that partnership with the seed and fertiliser dealers was required to achieve the desired impact from their research.

3.5 Questionnaire validation exercise

After a quick analysis of the results of the questionnaire and in line with the original terms of reference, face-to-face meetings with some of the respondents were undertaken to ascertain the validity of the responses. It was also necessary to examine such issues as the 'policy environment' under which the projects were conducted. A second questionnaire was drafted for this exercise.²⁴ To choose the respondents to visit, it was decided that a 'success' score for projects would be useful for comparing the projects. To develop this score, the factors (and questions) that were considered were:

²⁴ See Appendix 3.

Table 2. Score for measuring 'success' index .

Score	1	2	3	4	5
Question					
40	Not at all	Slightly	OK	Effective	Very effective
41	Not at all	Slightly	OK	Effective	Very effective
57	No increase	Slight increase	Moderate	Large change	Now has very high profile
58	No change	Small change	Moderate change	Large change	Completely changed

NB. For Q40, Q41 and Q58 each project was given an average score across all UoK.
 The 'success' index is: Q40 average score + Q41 average score + Q57 average score + Q58 average score = maximum 20.¹

1. Projects that did not complete one or more of the questions could not be included in the 'success' score as it could not be assumed that no answer = score of 0.

- Q40—Effectiveness of outputs (outcome measure)
- Q41—Effectiveness of modes of distribution of outputs (outcome measure)
- Q57—Increase in levels of debate about the research (outcome measure)
- Q58—Change that the project has influenced (outcome factor)

The scores for the scales for each question are given in Table 2. The 'success' index was visually compared alongside all other question responses (not including the questions in the index) to verify if any patterns/trends could be observed.

²⁵ Projects that did not complete one or more of the questions could not be included in the 'success' score as it could not be assumed that no answer = score of 0.

4.1 General features of the projects

The multi-country nature of the study dictated that only institutions with the capability to conduct trials in more than one country would lead such projects and programmes. As a result, the majority of the projects and programmes were led by the IARCs. Even projects that were recommended to the team by funding agencies, SROs and RECs were implemented by the IARCs. Of the 62 questionnaires sent out, 32 (52%) respondents completed their questionnaires in full (Table 3).

Unfortunately, there were no responses from North Africa. Therefore the data presented and the conclusions to be drawn are specific for sub-Saharan Africa. In all, 13 (41%) projects were initiated before the year 2000 while 19 (59%) were started after 2000. Of the 14 projects that were carried out mainly in East and Southern Africa, 12 (86%) were started after 2000. Eleven (11) projects were identified where most of the work was done in West and Central Africa. Of these, 5 projects (45%) began after 2000 and 6 projects (55%) began before. Eight (8) of the projects started more than 10 years ago. Respondents classified most of the projects as 'ongoing' (71%) while 4 of the projects were completed more than 4 years ago. The projects were truly multi-country (Figure 2). A total of 37 different African countries were mentioned as countries where the projects were carried out. The average number of countries covered per project was seven.

Twenty-one (21) of the 32 projects (66%) were classified as NRM projects while 11 projects (34%) were classified as agricultural or crop improvement projects.

Table 3. Distribution of institutions returning completed questionnaires.

Type of institution	Number of projects
CGIAR centres	20
Regional organisations	10
Others	2

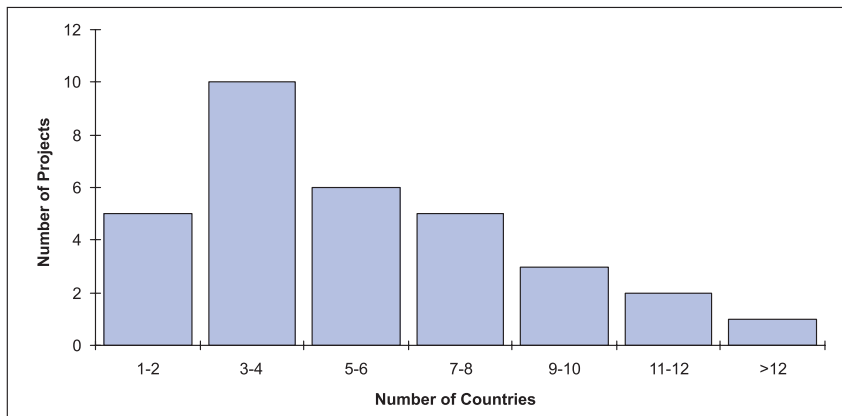


Figure 2. Number of countries in which projects operated.

4.2. Observed features at various stages of the projects

4.2.1. Project conception and problem definition

At project conception, farmers, government extension workers, NGOs, policy makers and other researchers who might contribute to the objectives of the project were identified as UoK by more than 70% of the projects. Planning meetings and workshops were the primary vehicle for involving all UoK in the project. However, after data analysis, it emerged that only 50% of farmers, NGOs and government extension workers were actually involved in decision making at project conception stage. The situation was worse with respect to the private sector. Although 21 projects identified the private sector as UoK, only 5 involved this sector in making decisions at project conception.

An analysis was made on the extent to which each of the following factors was considered during project inception:

- Scale of the problem
- Importance to the UoK
- Size of potential impact
- Probability of success
- Objectives/aims for dissemination
- How UoK will use the findings
- Channels for dissemination
- Who will disseminate the findings

Over 80% of the returns reported that they ‘mostly’ or ‘fully’ considered the following factors: the scale of the problem, its importance to the UoK, the size of the potential impact of the project, probability of success for the project and the objectives/aims for dissemination. For the remaining factors, more than 70% of the projects scored their consideration ‘mostly’ or ‘fully’.

The value of a monitoring and evaluation (M&E) plan was acknowledged by most of the projects (78%). When asked at what stage in the development and implementation of the project the M&E plan was developed, over half of the projects (57%) with M&E plans

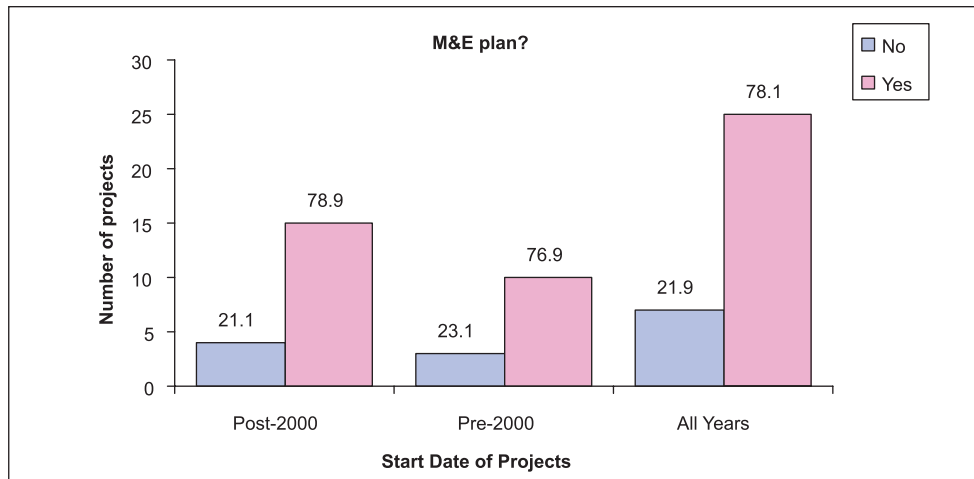


Figure 3. Number of projects with a monitoring and evaluation (M&E) plan (% of projects for time period shown at top of column).

reported that these were designed at the problem definition stage (Figure 3). Only three projects reported that they did not design the M&E plan until the project implementation stage; another three indicated that they did not implement the M&E plan until the ‘output’ stage of the projects. Most of the projects (79%) reported that the M&E plan was implemented during the project implementation phase.

Only one project reported not having measurable goals and targets. The main goals were focused on improving ‘products’, such as increased productivity, greater adoption of technologies, and improving regional and/or farmer capacity (increased knowledge/awareness). Incidentally, no project specifically referred to poverty reduction as a goal. In the main, the word ‘target’ was misinterpreted. Some respondents took the term to mean the ‘target population’ while others interpreted it in terms of quantitative targets.

4.2.2. Research inputs

The scientists involved in the projects came from three kinds of institutions: the lead institution (30), institutions that had previously worked with the lead institution (28) and institutions that had not previously worked with the lead institution (24). Eighty per cent (80%) of the respondents reported that the projects involved researchers they had not previously worked with; 22 projects indicated that all three categories of scientists were involved.

Choice of partnerships was dictated by the need to use expertise that was lacking in the lead institutions and by the geographic location of the project (Table 4).

The primary sources of funding for the projects, the percentage of the funding that came from the primary source and the percentage of the funding that was secured at the start of the project were important considerations in this study. Not unexpectedly, the primary source of funding for all the projects was the donor community. The countries where the projects were implemented did not provide measurable sources of funding. Funding agencies included the African Development Bank, the Asian Development Bank, the Federal

Table 4. Reasons for composition of project team.

Reason for involving others	No. of projects	% of projects
Expertise otherwise not available	25	89.3
Geographical location	23	82.1
Costs	8	28.6
Capacity building	5	17.9
Donor requirement	2	7.1
Synergies and economies of scale	2	7.1
Widen participation	2	7.1
Promote ownership of results	1	3.6
Regionality	1	3.6

Ministry of Economic Cooperation of the Federal Republic of Germany (BMZ), CIDA, Department for International Development (DFID), Netherlands Development Cooperation (DGIS), the European Union, the Global Environmental Facility (GEF), International Fund for Agricultural Development (IFAD), International Development Research Centre (IDRC), the Organization of Petroleum Exporting Countries (OPEC) Development Fund, The Rockefeller Foundation, Swiss Agency for Development and Cooperation (SDC), Swedish International Development Agency (SIDA), United Nations Development Programme (UNDP), United States Agency for International Development (USAID) and the World Bank. Some of these donors channelled their funding through the challenge programmes and the SROs. The financial ‘security index’ was defined as the percentage of the funding from the primary source multiplied by the percentage of the funding that was secured at the start of the project. The security index was rated as ‘high’ if the multiplication of these two elements was equivalent to at least 75% for both. Measured this way, of the 26 projects where all the required data were available, most (86%) were rated as either ‘high’ or medium’ (Figure 4).

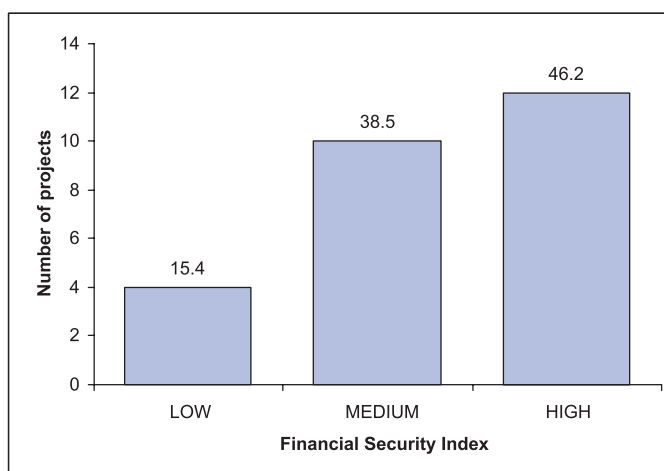


Figure 4. Financial security index of the project funding (% of projects in each category shown at top of column).

Approximately half of the projects (48%) reported that they experienced funding problems during the life of the project. Late payments from donors and lateness in accounting for funds spent in collaborating institutions were the major sources of the problems.

The time that a project is planned to run and the type of project are factors that affect the project's outcome and impact. It is usually thought that NRM projects require more time for the outcome and/or impact to be felt. With this in mind, the study wanted to determine, at the time of project conception, how many years they were expected to run. The majority of projects (58.6%) were planned to last no more than 3 years, although two projects reported that they were planned to last for more than 15 years. Fifty-one per cent (51%) of the projects reported that the time frame was not changed during the implementation of the projects.

4.2.3 The research process

The majority of projects involved NARS, IARCs, NGOs and universities. The nature of the interaction between the various participants varied according to participating institutions. NARS and IARCs carried out research activities together mostly through research networks while NGOs and universities thought of themselves as working in partnership with the scientists in the IARCs. Quite significantly, farmers and farmers' organisations were not considered to be important participants in the research process.

Researchers at lead and partner institutions dominated the planning, reviewing, approval and monitoring of research plans and activities. But UoK also significantly participated in the planning and monitoring of research components (63.3% of the projects). The interactions between the different organisations involved in the projects are given in Table 5.

Organisation type	Alliance	Linkages to market	Linkages to policy process	Networks	Partnership	Paternalistic	Purchasing
Donor						1	1
IARC	5	5	2	10	14		
International partner (other)	1	1	1	1	4		
NARS	2	5	2	25	32		1
NGO	2	8	1	6	14		
Private	2	8		5	6		
Regional network			1	2	2		
Regulatory agency			3				
University	1	1	1	6	12	1	

Researchers again dominated the planning, reviewing and approval of and access to the details of the financial plans. The UoK were less involved and less responsible for aspects of financial arrangements during the research process. Monitoring of financial arrangements was more the responsibility of researchers of the lead institutions than it was of researchers at partner institutions. UoK played an insignificant role in monitoring financial arrangements and in only 37% of the projects did they have access to details of financial arrangements.

Almost all respondents (90%) indicated that feedback was obtained from the UoK at least once a year. In seventy-one per cent (71%) of the projects, feedback on the progress of the project was obtained from researchers at partner institutions more than once a year. The main mechanisms for obtaining feedback from researchers were meetings (77%) and reports (71%); the main mechanism for obtaining feedback from UoK was meetings (86%). During the research process, a large proportion of the projects (83%) reported that the demands of the UoK were re-assessed at project implementation and 67% of the projects reported that this re-assessment influenced the design process. A significant number of projects (79%) reported that they re-assessed the needs of the UoK at production of outputs/publications.

Researchers in most of the projects stated that they were accountable primarily to their own institute (96%) and to donors (83%). Almost half (46%) of the respondents reported that they were also accountable to farmers. However, researchers did not think they were accountable to policy makers or to NGOs. It is also significant to note that half of the respondents reported that there were no built-in incentives for good performance. The half who reported that there were incentives consciously built into their projects mentioned: recognition by peers and supervisors, per diems and other monetary benefits and training opportunities.

4.2.4 The innovation process

The innovation process defines the process that was utilised to transform the outputs into outcomes. Since many UoK were involved at project planning, it was pertinent to know which of the UoK the project aimed directly to deliver the outputs to (Table 6).

Table 6. Targeting the UoK.

UoK type	Number of projects	% of projects
Researchers (not project team)	21	84
Farmers	20	80
Policy makers	20	80
NGOs	17	68
Government extension	16	64
Private sector	13	52
Health sector	2	8
Regulatory agencies	2	8
Development agencies	1	4
Donors	1	4
Universities	1	4

UoK type	No. of outputs 'effective' or 'very effective'
Development agencies	1
Farmers	21
Researchers (not project team)	2
NGOs	19
Government extension agents	17
Policy makers	11
Private sector	6

In spite of this long list, 66% of the respondents felt that there were additional UoK that should have been involved. Prominent among these are input suppliers, output buyers, credit institutions, secondary and primary schools, pesticide dealers and organisations that serve the national extension service.

In response to the question 'How well did the output meet the UoK needs?' the respondents considered the majority of outputs to farmers, extension agents, NGOs and other researchers to be 'effective' or 'very effective' (Table 7).

Outputs received by the private sector and the policy makers were generally less effective.

When considering the effectiveness of the delivery method of outputs to the various UoK, a high proportion of projects considered their output delivery methods for farmers (82%), other researchers (82%) and NGOs (70%) to be 'effective' or 'very effective'. Half the projects indicated that the delivery methods of outputs to government extension workers were 'effective'. However, several projects observed that their method of delivery of outputs to policy makers and the private sector were 'less effective'.

Results were analyzed to learn if feedback on the outputs was obtained from the various UoK. The summary of the results is presented in Table 8.

Two-thirds of the projects (63%) received feedback on the outputs when the outputs were being prepared. In nine of these projects, there was a follow-up after the outputs had been completed. Surveys and meetings were the most common mechanisms used by the projects to obtain feedback from the UoK.

Feedback?	Number of projects	% of projects
No	1	3.7
Yes	26	96.3

Table 9. Completion of project output within project timeline.

Extent of completion	Number of projects	% of projects
All on time	2	12.5
Most on time	12	75.0
Some on time	2	12.5

4.2.5 Research outputs

The time factor was taken into account in the analysis of the implementation of the projects and therefore sought to know if, within the planned period, all ‘planned outputs’ were completed. Over half (55%) of the projects stated that all planned outputs were completed. Since 71% of the projects were reported to be ‘continuing’, the data on completed planned outputs was interpreted to mean ‘all planned outputs have been completed so far’. This interpretation is validated by the data in Table 9 in response to the question ‘If yes, to what extent were these completed according to the project timeline?’

Not surprisingly, agricultural practices, technologies, methods and tools were the major outputs mentioned by the various projects. Various modes of distribution were used by scientists to distribute the different output types. Demonstrations and journal articles/publications were the main modes of distribution for agricultural practices and technologies. Journals/publications, training and demonstrations were used to distribute methods and tools. Recognising that most projects are still ongoing, most of them reported that there were no un-planned outputs produced.

Having earlier developed a financial security index, a concern was to find out how the outputs would have changed if the projects had: a) double the funds to spend in the same time and b) half the funds to spend in the same time. Most projects indicated that they would have produced additional outputs had the funding been doubled. In the same vein, reducing the funding by half would have adversely affected the completion of the outputs during the project’s timeline. Some projects indicated that not only would the outputs have increased with increased funding, but, to a greater degree, there would have been greater impact on the livelihoods of the rural communities; fewer funds would mean fewer families would be reached.

4.2.6 Research outcomes and impact

Almost all the projects (92%) indicated that there had been increased awareness of the project research findings in journals, libraries and/or the public domain. Forty-three per cent (43%) of the respondents observed moderate increases in the levels of debate around the research theme; 29% of the respondents indicated that as a result of the project, the research issue had a large increase in profile while 25% reported a very high increase in profile.

Each project was requested to state, for each major UoK, the level of change (adaptation or incorporation of the research findings/results/information, feedback) (Table 10).

The results indicate that significant increases in the ‘level of change’ were made by farmers, extension agents, NGOs and researchers that were not part of the team. Earlier, 80% and

UoK	None or small change	Moderate change	Large change	Completely changed	Total (n)
Farmers	2 (8)	9 (36)	12 (48)	2 (8)	25
Govt. Ext. agents	7 (28)	11 (44)	7 (28)		25
NGOs	4 (16.7)	7 (29.2)	12 (50)	1 (4.2)	24
Policy makers	13 (50)	9 (34.6)	4 (15.4)	–	26
Private sector	7 (35)	7 (35)	6 (30)		20
Researchers (not project team)	3 (10.7)	11 (39.3)	11 (39.3)	3 (10.7)	28

Note: numbers in brackets are percentages.

52% of the project had stated that the outputs had been targeted at the policy makers and the private sector respectively. This investment seemed to have paid off. The level of change for policy makers was moderate to large for 50% of the projects; while for the private sector, the level of change was rated moderate to large for 65% of the projects.

A surprising 32% of the projects reported that a formal impact assessment has been carried out. This figure was strongly questioned since more than 70% of the projects are ongoing. Of the 32% that indicated that a formal impact assessment has been done, 7 were ongoing projects. When asked to describe the impact made by the project, most respondents highlighted increases in capacity, and demand for and interest in new technologies. Only one project mentioned its impact on influencing science and policy. However, several projects referred to improving livelihoods through increased farmer income. This raised the question of whether there was sufficient time for the scientists to make this observation.

A ‘success’ index was established to choose the candidates for the face-to-face meetings (Table 11).

Score categories	Number of projects
10–<12 (50–60%)	3
12–<14 (60–70%)	6
14–<16 (70–80%)	9
16–18 (80–90%)	7
Missing	7
Total	32

The average score was 14.4, the minimum score was 10.5 while the maximum score was 17.2.

Some projects were started before 2000 while others were started after. For each of the regions (West and Central Africa, and East and Southern Africa), at least three projects that started before or after 2000 with a score below the average and three projects from the same periods with scores above the average were selected.

4.2.7. Face-to-face interviews

A summary of the results of the face-to-face interviews (questions in Annex 3) with the selected scientists is presented below:

The interviews elicited many responses on the characteristics of a successful project:

- Good, visionary and accommodating leadership
- Clear vision
- Client driven
- Complementarities between disciplines and team spirit
- Clear definition of roles, responsibilities and expectations during project formulation
- Presence of a Memorandum of Understanding (MoU) between participating institutions and other partners
- Outcome/impact oriented rather than emphasising outputs
- Flexibility in the roles of participants: new partners can join the project as necessary while old ones can leave as necessity dictates
- Transparency (management and finance)
- Effective communication
- Mutual trust and commitment of all stakeholders
- Assured funding that is received and accounted for on time

Respondents indicated that if they were to repeat the project, they would place more emphasis, from the beginning of the project, on empowering farm communities rather than on process research.

On characteristics of unsuccessful projects, most scientists indicated that many of the projects they had participated in were generally excellent in both knowledge generation and capacity building of scientists from all the institutions involved. These projects had achieved the stated outputs. However, in terms of impact at the farm level, very little has been achieved. This is especially true for NRM projects.

Failure to recognise when a project is not meeting the goals of the UoK and taking timely remedial action is one of the characteristics of an unsuccessful project cited by the respondents. However, some scientists felt that an unsuccessful project does not necessarily mean that the technology has failed. Very often, the failure stems from the failure of the donor to allow more time for the farmers to work with the technologies, master them and then adopt them.

The respondents described the roles of the various players (farmers, extension agents, local policy makers, NGOs, the private sector and scientists) in multi-stakeholder projects:

- Farmers should be allowed to express the specific problem that they want to be prioritised in the project, i.e. they should set the broad research agenda. Farmers are able to make simple observations and keep simple records. They must be compensated for their time, labour and land but must be made to recognise that the scientist is not a ‘donor’. The farmer’s contributions become more prominent if scientists recognise that s/he is an entrepreneur and that the relationship between them should be one of knowledge sharing (technology exchange).
- The extension agent/NGOs should use various tools of knowledge dissemination to increase the ‘levels of change’ (outcome) for the UoK. Increasing the level of change requires the participation of strong farmer groups. NGOs and extension workers have a comparative advantage when developing or organising these groups.
- Policy makers should create an enabling environment for the farmer to benefit from the adoption of new technologies. Local officials can foster and facilitate farmer-to-farmer knowledge exchange. The policy makers can also facilitate observance of by-laws.
- In terms of the commodity chain approach, the private sector should facilitate the development of input/output markets. The private sector is accused of being opportunistic. Private companies are conscious of, and value their time. Scientists in sub-Saharan Africa have found partnership with the private sector fickle because they lack an institutional framework. Owners and operators of large-scale farms and multinational companies engaged in agriculture in East and Southern Africa do not show much interest in the problems of small-scale farmers (the domain of public sector research) and have little time for partnering with public sector researchers and stakeholders.
- Scientists should make sure that they are accountable to the society for the products of research. They should ensure that the goal of research is not to produce outputs. Technologies generated must be environment friendly. In general, all stakeholders should work together right from problem identification, testing, scaling up to impact evaluation.

Respondents had different ideas on what constituted the ‘private sector’ depending on which region they were from. The private sector includes people dealing in the input/output market, providing credit facilities and carrying out product processing in West and Central Africa. It also includes large-scale farmers and corporations in East and Southern Africa.

Respondents agreed that the African (small-scale) farmer, like farmers elsewhere in the world, is driven primarily by a profit motive and responds significantly to price incentives. Therefore, the farmer is part of the ‘private sector’. Very few African farmers (if any) farm solely to subsist. Appreciating this fact could greatly change the present paradigm of a romanticised African farmer rooted in the soil of his ancestors and unwilling or reluctant to adopt new technologies to a new and futuristic paradigm of an African *entrepreneur* out to create wealth using his/her skills, knowledge and labour.

Every scientist interviewed agreed that team leadership determines the success or failure of research projects. A project without a good leader is like a car being driven by a drunk driver.

Proof that dedicated visionary leadership leads to success of projects is seen from the outcome of the project on ‘participatory tree domestication’ in the humid regions of West and Central Africa. The ‘success index’ was 16.3 which was considered high. A formal

impact assessment has not been carried out. During the visit, it was found that the project has used various schemes to extend the life of the project after every three years. Success with the farmers has been achieved by embedding staff from IARCs within national research organisations thereby promoting cross-fertilisation of ideas. Over 1000 farmers are currently practising the participatory tree domestication. These farmers have their own nurseries and train other farmers. In terms of capacity building, five people, three of them women, have been trained at PhD level while 57 students have received their MS degrees, 20 of whom are women.

Many scientists had something to say about the policies of donors:

- Not in alignment with farmers' priorities
- Donors' policies generate unhealthy competition
- Insufficient and unreliable funding, e.g. the ASARECA competitive grant scheme (CGS) programme funded by the European Union where funds dried out in mid-course
- Rapid change in donor priorities

The review was also focused on learning what the respondents thought about how the gender or poverty focus affected the success or failure of research projects. In many parts of Africa most farm activities are carried out by women. Projects that do not take into account the low investment power of the farmers and the gender issue fail.

Both gender and poverty issues are considered politically correct and therefore many project participants take them into account at the planning stage. However, these issues are ignored (overtly or covertly) during implementation. For these issues to remain relevant, measurable outputs must be assigned to the activities.

Poverty should not always be seen in terms of food insufficiency. Inability to earn the cash with which to produce or purchase food should be the determining factor.

Judging by the answers to Q37 of the main questionnaire (Annex 2), there appeared to be the perception that the end user (ultimate beneficiary) of knowledge is the farmer. Many respondents said that they had always considered the farmer the end user of their products. During discussions of the value chain concept, it dawned on the respondents that the farmer is not an 'end user'. Most agreed that scientists have traditionally developed projects with the goal of achieving the outputs. Measurement of performance for both the institutes and scientists is based on achieving the outputs as stated in project documents. Farmers were decidedly in the front row in receiving the products of research but this would not make them the 'ultimate beneficiaries' of research. All the scientists agreed that an increase in the level of change among UoK should be the goal of projects and that the farmer is just one class of UoK. Others include scientists, policy makers, input/output dealers, processors, vendors and consumers. Consumers have increasingly become the driving force in the commodity value chain.

Some of the interviewees said (and it is agreed) that the focus on the farmer as the ultimate end user and beneficiary of agricultural research has, in a large measure, contributed (unwittingly) to the absence of a significant impact of agricultural research in Africa. There are factors under the control of other players such as market development, policies and infrastructure which limit the expression of the farmer's ingenuity, resourcefulness and

entrepreneurship. Effective action by other UoK could be the key to the agricultural (green) revolution in Africa.

On the time frame of their projects and whether this was realistic to achieve impact, respondents contended that in terms of the stated outputs, their projects have succeeded to generate knowledge, publications and capacity building of scientists.

It is impossible and unrealistic to expect to achieve impact from NRM type projects in less than 5 years. Therefore NRM projects in Africa (e.g. AHI) have not had the anticipated impact at either the community or livelihood level. Respondents said NRM projects should be given a span of 10 to 20 years.

In general, the scientists did not agree with the statement ‘multi-stakeholder multi-country research projects are time and resource intensive and the benefits do not justify the time and resource investment’. The advantages of such projects include networking, capacity strengthening and more effective and efficient use of resources. The respondents cited several additional advantages (summarised below):

- Achievement of economies of scale and efficiency in research and development by concentrating scarce human, financial and other resources on key national and regional problems
- Increased bargaining power with external partners
- Helps to minimise duplication
- Promotes exchange of information and the combination of collective experience of professionals in the same field
- Promotes collaborative research through network experiments
- Promotes joint capacity building
- Promotes capture of research and development spill-over/spill-in effects
- Enables rationalisation of human resource development
- Facilitates mobilisation of research efforts on transnational problems that require collaboration between countries
- Promotes exploitation of a larger market for agricultural research technologies through regional collaboration
- Regional collaboration can lead to faster demonstration of impact despite declining investment in agricultural research and development
- Increases the chances of achieving lower transaction costs
- Can facilitate better and more access by all stakeholders to available technologies at regional and international levels

A few disadvantages of these projects were also noted. Chief among these were:

- Complex projects consume time and money to prepare and to coordinate activities. In some CGIAR centres project hunting and coordinating has become a full time occupation leaving researchers with little time to do research. Some have suggested that project coordination should become a full-time job and no scientist should be required to combine this task with that of doing research.

- Some respondents felt that multi-country projects should be led by countries rather than by IARCs. The CGIAR centres should backstop the projects but should not lead them. This would be a faster way to build not only scientific capacity but also project management capacity.

According to the interviewees the questionnaire, as a methodology of obtaining information, was relevant. It enabled the respondent to reflect on the questions and to provide an honest and unbiased answer. However, there were some concerns:

- Potential respondents should have been fully sensitised as to the usefulness of the study.
- Some respondents said that the questionnaire was too long and too time consuming. Others said that if they were not familiar with the consultants they might not have taken the time to complete it.
- Some suggested that initially there should have been a short questionnaire of about 10 general questions involving 10 respondents. The responses should have then been analysed and on the basis of that analysis, the review could then have come up with a detailed questionnaire for distribution to a wider audience. This could have been followed by focused group discussions, small workshops, or expert consultations in a country or group of countries from which selected paid sub-consultants would have collected the information in a much shorter time.
- Respondents suggested that they should be compensated by being acknowledged and recognised for their participation and by receiving the final outcome (report) of the study.

Not surprisingly, the majority of the programmes and projects were led by NIARCs, especially, the CGIAR centres. However, the non-participation of existing regional agricultural institutions was disappointing. For example, that was the existence of the Comité permanent Inter-Etats de Lutte contre la Sécheresse dans le Sahel (CILSS) with its strong agricultural division Institut du Sahel (INSAH) in the CORAF/WECARD region. In the ASARECA sub-region, there is ICIPE. Thus a concern addressed by the review was to determine the relationship between these ‘old’ establishments and the ‘new’ SROs.

In West and Central Africa, CORAF/WECARD has an MoU with INSAH and is considering a wider MoU with CILSS. CORAF/WECARD also has an MoU with the Economic Community of West African States (ECOWAS), the Communauté Economique et Monétaire de l’Afrique Centrale (CEMAC), and Union Economique et Monétaire Ouest Africaine (UEMOA). It is currently in negotiations with the Communauté Economique des Etats de l’Afrique Centrale (CEEAC). At the last General Assembly of CORAF/WECARD, the Secretariat was authorised to plan for the inclusion of some of these regional organisations in CORAF/WECARD’s Governing Board. Such developments are encouraged. As noted earlier, no measurable funding was provided by the 37 African countries where the 32 projects reviewed were carried out. Inclusion of the sub-regional economic communities (RECs) in decision making in regional agricultural research and development might broaden the appeal of agricultural research to both local policy makers and entrepreneurs and increase the local funding base for the regional and national agricultural research institutions.

Proof of the statement above to the effect that the CGIAR has gone from ‘involving only the researchers to involving farmers and a wider range of partnerships in national systems including the universities and the NGOs’ is provided by the wide array of UoK that were involved at project conception in this review. The identification of the policy makers and the private sector as UoK is noteworthy. Unfortunately, while decrying the fact that fewer than 50% of the farmers, extension workers and NGOs were involved in decision making, policy makers and the private sector fared much worse. This anomaly might be explained by the fact that the main strategies for involving the UoK were meetings and workshops. The number of planning meetings may not dampen the enthusiasm of scientists but the same does not hold true for policy makers and the private sector. It is therefore recommended that the number of planning meetings and workshops be held to a minimum. Tasks and roles of partners should be defined early in the planning process.

Very few projects identified donors as UoK. It is believed that donors should identify with the projects that they are supporting. Therefore, they should be regarded as partners and benefit from the impact generated by a successful project. By excluding donors from UoK, scientists may be limiting their ability to obtain more resources for research. As the saying goes, 'success is everybody's child; failure is an orphan'.

Note was taken of the growing importance of NGOs. Many scientists would indicate that the NGOs were forced on them by the donors and the Science Council anxious for impact since the extension systems in most countries are very weak. The involvement of NGOs should be welcome as they are one of the primary agents for transforming the products of research into outcomes (see comments below).

With regards to M&E, almost all projects (78%) acknowledged the value of an M&E plan and of having this plan designed at the project conception stage. The impact pathway framework adopted for this review emphasises this procedure.

All but one project had measurable goals and targets. It was noted, however, that poverty reduction was not a goal for any project including those projects designed after 2000 when the CGIAR amended its goal and mission to include poverty reduction. The goals focused on 'products' which, in reality, were the 'outputs' designed for the projects. Thus, while 100% of the projects considered achieving research outputs as the goal of the project, only 14% considered a *favourable outcome* such as policy change as a goal. In line with the mission and goal of the CGIAR and the MDGs, it is recommended that the primary goal of agricultural research projects in sub-Saharan Africa should be poverty reduction. Most of the projects involved partnership with scientists that the lead institution had not worked with before. Sharing of expertise not available in the lead institution and geographic location of projects were the main reasons. It is believed that this process of partnering with this wide array of scientists has the potential to increase regional institutional capacity. This is a marked advantage of multi-country projects. The financial security index was highest when institutions obtained most of the pledged funding at the start of the project. The correlation between the two indices became apparent when determining the success index. Problems with funding also affected the time that projects were expected to run. As noted earlier, the average planned period for projects was 3 years. It has been noted above that a majority of the projects (66%) were classified as NRM projects. Was it any wonder that scientists emphasised project outputs as their goals? Transforming the products of NRM research into outcomes takes more than 3 years! During the validation exercise, the scientists confirmed the observations. If the goal of NRM research in sub-Saharan Africa is to reduce poverty, the donor community has a responsibility to change the way it funds such projects and programmes. It is emphasised again that the donor as UoK should be involved during the project conception phase. A clear understanding of the nature of the project, the priorities identified by all UoK and the goal (outcomes and impact) of the project would help the donor decide how to fund the project and effectively monitor performance. Similarly, encouragement is given to having a stronger involvement of policy makers, especially those at the local level, at the problem definition and priority setting stage. Scientists should learn to use the local leaders such as the village chiefs as advocates to promote the goals of their projects. Partnerships between RECs, national governments, local government officials and donors will constitute a formidable base for supporting AR4D. Without local support, the sustainability of NRM research will be hard to attain.

The framework that was used to review these projects was successful in enabling us to state categorically that multi-country projects promoted partnerships and networking among NARS, IARCs, universities and NGOs. Partnerships lead to strengthening of capacities. What was also striking was that the private sector was used primarily to promote market linkages (38%). This is vital if a commodity-chain approach is to be used to strengthen AR4D in sub-Saharan Africa.

Once the inception phase was over, researchers at the lead and partner institutions took over responsibility for planning, reviewing and approving research components to the exclusion of the other UoK. Approval of plans for research components was done almost exclusively by the lead institution. With respect to planning of financial arrangements, scientists at both the lead institution and partner institutions made all the financial arrangements, reviewed the plans for financial arrangements, approved plans for financial arrangements and had access to the details of financial arrangements. Among those not involved in decision making were scientists from the NARIs, farmers, NGOs and government extension workers. The objective of this apparent lack of transparency was to minimise the transaction costs. It is believed, however, that true partnership involves building trust and transparency. Scientists from the IARCs have always pointed to the reluctance, and indeed, unwillingness of research managers in the NARS to share the resources they received from donors; it is now time to eliminate the blame game. The well-being of the community should be the driving force behind the utilisation of the resources for research that affects that community. In the sub-Saharan African context where national governments provide very limited support to agricultural research and where capacity within the NARS is weak, the donors who supply funds to both the IARCs and the NARS must insist on greater transparency and accountability to all UoK. Lead institutions must begin by finding ways to provide adequate feedback to all partners. The beneficial greater involvement of all UoK in monitoring research components (63%) and viewing the results of monitoring of research activities (63%) was appreciated.

The progress made in receiving feedback from all UoK at least once a year was also noted. Such feedback ensured that there was regular re-assessment of the needs and demands of the UoK. Such re-assessment, which occurred during the project implementation phase, usually led to a re-design of the projects.

For most projects, scientists were accountable to the donors and to their own institutions. Several reasons were deduced as to why this was the case. First, the timeline for the projects was too short resulting in project outputs becoming the project goals. Second, for the scientists, achieving the stated outputs was the main yardstick for performance measurement. It is believed that, had achieving project outcome and impact been the goal of the projects, accountability would be distributed among all stakeholders who are in a position to achieve, the desired goal. It is strongly believed that if progress is to be made in AR4D, there must be accountability to all UoK. Scientists must stop the habit of ascribing failure to transform outputs into outcomes to 'constraints' that could have been eliminated during project planning and inception if the right partnerships had been formed. These 'constraints' are nothing but unwarranted assumptions concerning the likely adoption of research results. In planning research projects, researchers should not take for granted that (a) there will be an effective extension service to disseminate research results, (b) farmers will willingly invest in new technology and (c) markets will be able to accommodate increased supplies of the agricultural produce. Involving key partners who would ensure the success of the projects would eliminate these assumptions. It is suggested that the ability to create a productive

partnership that enhances the chances of transforming project outputs into outcomes and impact should be rewarded by the research institutes. Project managers must recognise that incentives and accountability are strongly linked.

From the responses it was apparent that the perception of the scientists was that the farmer was the end user for the projects. This perception was confirmed during the face-to-face validation exercise. The farmer is the immediate beneficiary of the *project outputs*. As long as the goal of the project is to achieve the stated outputs, this perception of the farmer being the end user of the products of AR4D will persist. It is believed that when the commodity chain approach is applied, the farmer is only part of the system of UoK. If the goal in planning and implementing research is poverty reduction, society at large (and especially the *consumer*) must be considered the ultimate beneficiary of research. No matter how good the 'research products' (improved varieties, water and nutrient management technologies etc.) are, the farmer will derive little benefit if there are no customers to buy her/his farm produce. Targeting these consumers so that the products of research, when transformed into goods and services, can enable the consumers to share their wealth with the farmer, should be the goal of AR4D. Over 80% of the projects reported that they aimed to deliver the outputs to researchers (84%), farmers (80%), policy makers (80%), NGOs (68%) and government extension workers (64%). The need for a paradigm shift is obvious. For a project to achieve impact, the outputs must be *delivered* to the targeted UoK. In the innovation systems approach, the innovation process involves increasing the 'level of change' in those to whom the project's outputs have been delivered. In the AR4D system in sub-Saharan Africa, the agents who deliver the outputs are mainly NGOs and the government extension workers. It is recommended that the NGOs and the government extension workers be recognised as the necessary 'boundary organisations' whose roles would be to transform research outputs into outcomes and eventually impact. Enabling these agencies to increase their capacity must be a primary responsibility of any AR4D programme.

Several tests were run to determine the effectiveness of the outputs and outcomes. Several hypotheses were developed for these tests. They included:

- Outputs and outcomes for UoK will be more effective if these UoK were involved at project conception.
- Projects with a high security index at the start of the project (i.e. high percentage of funding secured and higher percentage from the primary donor) would produce more effective outputs and outcomes.
- If a project suffers from funding problems, these will affect the effectiveness of outputs and outcomes.
- Projects that were originally designed to last for less than 3 years may be less able to produce highly effective outputs and levels of change.

The results can be summed up as follows:

- Policy makers who were either not very involved at project conception or were not identified as UoK at project conception received less effective outputs. In addition, projects that 'fully' considered how UoK would use the project findings observed high levels of change for policy makers as compared to projects that only 'partially' considered how UoK would use the project findings. This finding reconfirms the earlier recommendation in this report that policy makers be 'fully' involved at project planning and priority setting to ensure sustainability of the projects.

- Projects that considered the channels of dissemination ‘fully’ at project conception observed a higher level of change for government extension workers. Those that ‘fully’ considered who would disseminate the research findings observed high levels of change for policy makers. The term ‘level of change’ is used as a measure of outcome. Therefore, this observation strengthens the recommendation that government extension workers and NGOs be strengthened to transform outputs into outcomes.
- There was an indication that projects with ‘high’ financial security produced more effective outputs.
- For effective outputs, a smaller proportion of projects originally planned for more than 3 years produced effective outputs, especially for the extension workers. A higher proportion of projects planned for less than 3 years produced non-effective outputs for policy makers but a higher proportion of projects planned for more than 3 years produced effective outputs. One possible explanation is that projects that run for less than 3 years do not have enough time to reach a stage when they can begin to affect policy. It is recommended that donors keep this in mind if the outputs of the research they support are to be transformed into outcomes. High levels of change are needed for home-grown political support and sustainability of AR4D programmes.
- There was a pattern to suggest that outputs to the private sector were more effective if the private sector interacted on the project. In addition, a slight pattern was observed that suggested that there were higher levels of change for the private sector if they interacted on the project.

In choosing the respondents for the face-to-face meeting, it was decided that a success score for projects would be useful to compare them. This study paid greater attention to project outcomes rather than to project impact. For one thing, most of the projects were ongoing and would ordinarily not be expected to have impact. More significantly, as observed by Hall et al. (2003) economic impact assessment (which tends to be the model favoured by the CGIAR) as a research management tool does not give insight into how research can be improved as a process. Hall et al. (2003) assert that economic impact assessment excludes the research process and its institutional context from the analysis. They therefore recommended that this assessment should be complemented with innovation systems perspectives, an approach where an appreciation of institutional context and institutional learning is central to the analysis and research management procedures. In the one-to-one interactions, the goal was to ascertain the institutional context of the research, the influences of the institutional context on the research process and the implications this has on the social and economic outcomes.

1. The analysis of the responses clearly demonstrated that multi-country projects promoted partnerships and networking among NARS, IARCs, universities and NGOs. It was also observed that these partnerships had the potential to increase regional institutional capacity. The results of the face-to-face interviews indicated that these were but a few of the advantages of multi-country projects. **Based on these advantages, it is recommended that FARA promotes multi-country projects as a mechanism of carrying out research by African countries. The SROs should be strengthened to play the lead role in this process with the CGIAR centres playing a backstopping role. Multi-country projects are complex and complex projects consume much time and money. Coordination of these projects should be a full-time assignment.**
2. The SROs were established to promote collaboration and sharing of tasks between research centres in neighbouring countries and to host sub-regional networks. **It is recommended that the relationship between the SROs, existing CGIAR research centres with sub-regional mandates and sub-regional economic communities be strengthened. Inclusion of the sub-regional economic bodies in decision making in regional agricultural R&D might broaden the appeal of agricultural research to both local policy makers and entrepreneurs and increase the local funding base for the regional and national agricultural research institutions.**
3. While scientists have recognised the need to involve both policy makers and the private sector as UoK in multi-country agricultural research and NRM projects and programmes, the researchers appear to be groping for ways to maintain the interest of these 'non-traditional' partners throughout the project's lifetime. Scientists may be less conscious of the high opportunity and transaction costs involved in the numerous planning meetings and workshops which policy makers and the private sector cannot afford. It is therefore recommended that the number of planning meetings and workshops be held to a minimum. Tasks and roles of partners should be defined early in the planning process.
4. In a region where funds for both national and multi-country programmes and projects are secured from donors, it was not surprising to find that there was a strong correlation between a project's success index and its (financial) security index. The security index was highest when the multiplication of the primary source of funding per cent and the per cent of funding secured at the start of the project was equivalent to at least 75% for both. At the same time, results indicated that funding issues affected the time projects were expected to run. As some scientists indicated during the face-to-face interviews 'when a project fails, it is not the technology that failed. Very often, the failure stems from the failure of the donor to allow more time for the farmers to work with the technologies, master

them and then adopt them'. It is recommended that donors be more involved as part of the UoK during the project conception phase. A clear understanding of the nature of the project, the priorities identified by all UoK and the goal (outcomes and impact) of the project would help the donor to decide how to fund the project and effectively monitor performance.

5. The results of this study show that most projects had a life span of just over 3 years. This time was sufficient to achieve the project outputs. However, there was no time to translate these outputs to outcomes and impact. Most respondents believe that to demonstrate outcomes and impact, funding should cover periods of 10–15 years. This is particularly important for NRM projects. **It is therefore recommended that FARA and the SROs should seek longer-term funding for multi-country research projects.**
6. African governments have recognised that overall economic performance in their countries depends on how well the agricultural sector performs. Poverty reduction through improved agricultural growth is the pillar of the Poverty reduction strategy papers (PRSPs) of African governments. Unfortunately, poverty reduction was not an explicit goal of any of the projects that were reviewed. **It is recommended that, in line with the PRSPs and the mission and goals of the CGIAR and the MDGs, poverty reduction should be the goal of multi-country agricultural and NRM programmes and projects.**
7. Considering policy makers and the private sector as UoK is fast becoming the norm in planning and implementing multi-country projects. **A stronger involvement of policy makers, especially at the local level at the problem definition and priority setting stage, is highly encouraged. Scientists should learn to use local leaders such as village chiefs as advocates to promote the goals of their projects. This, in addition to the strengthened partnerships between RECs, national governments, local government officials and donors, will constitute a formidable base for supporting AR4D. Without local support, the sustainability of NRM research will be hard to attain.**
8. It was observed that once the research process was under way, the scientists assumed total control of planning, reviewing and approving the research components. Scientists also made all the financial arrangements, approved plans for financial arrangements and had access to details of these arrangements. **It is recommended that in all matters relating to the projects, scientists and their institutions must be transparent and accountable to all UoK. Scientists must attempt to stop the habit of ascribing failure to generate noticeable impact to unwarranted assumptions that could have been eliminated during project planning and inception where the right partnerships should have been formed.**
9. There is a strong perception (sometimes sub-consciously) on the part of funding agencies and scientists that the farmer is the end user or the ultimate beneficiary of agricultural and NRM research projects. While this may have been so in a purely or largely subsistence agricultural economy where achieving the research outputs is a primary goal, this is no longer the case in present day Africa. Today, African farming is increasingly being driven by local, regional and international markets and will be more so in the future. From the discussions during the face-to-face interviews, it was concluded that the farmer is 'only one' of the intermediate beneficiaries and that the consumer, rarely mentioned in project documents, is arguably the end user or ultimate beneficiary of agricultural and NRM research projects. It is therefore recommended that there be a shift of emphasis from the farmer to the consumer as end user or ultimate beneficiary of agricultural and NRM research projects, in the value chain context, and that the design of single or multi-country projects should reflect this fact. FARA should initiate debate on this matter.

CGIAR respondents

CIMMYT

1. The East and Central Africa Maize and Wheat Network (ECAWAN) (ASARECA Network) made up of three projects:
 - a. Africa Maize Stress Project
 - c. Striga ProjectContact person for all three: z.mduruma@cgiar.org
2. Soil and Water Management Research Network (SWMnet) (ASARECA)
Contact person: n.hatibu@cgiar.org
3. Soil Fertility Management Network for Maize-Based Farming Systems in Southern Africa
Contact person: m.mekuria@cgiar.org

ICRISAT

4. Desert Margins Program (DMP)
Contact person: s.koala@cgiar.org
5. Improvement of Pigeon Pea in Eastern and Southern Africa
Contact person: s.silim@cgiar.org
6. SADC Sorghum and Millet Improvement Project (SMIP)
Contact person: m.mgonja@cgiar.org

ILRI

7. Nutrient Management in Small Scale Crop-Livestock Farms in the Sahel and Dry Savannah of West Africa
Contact person: s.fernandez-rivera@cgiar.org
8. Crop-Livestock Systems in the Dry Savannahs of West and Central Africa (part of the Systemwide Livestock Programme)
Contact person: s.tarawali@cgiar.org and i.okike@cgiar.org
9. Balancing Livestock Needs and Soil Conservation: Assessment of Opportunities in Intensifying Cereal-Legume-Livestock Systems in West Africa
Contact person: r.abaidoo@cgiar.org

CIFOR

10. Adaptive Collaborative Management

Contact person: c.colfer@cgiar.org

11. Non-timber Forest Products: Global Comparison of Marketed NTFPs

Contact person: b.belcher@cgiar.org

IRRI

12. International Network for Genetic Evaluation of Rice (INGER)

Contact person: e.redona@cgiar.org

WARDA

13. Phosphorus Nutrition of Rice Combined with Effect on Nitrogen Fixation by Leguminous Species on Acid Soils

Contact person: l.nartey@cgiar.org/e.somado@cgiar.org

14. IVC: The Platform for Inland Valley Research in Sub-Saharan Africa.

Contact person: p.kiepe@cgiar.org

CIAT

15. African Network for Soil Biology and Fertility

Contact person: a.bationo@cgiar.org

IWMI

16. Wetlands-based Livelihoods in the Limpopo Basin: Balancing Social Welfare and Environmental Security

Contact person: m.masiyandima@cgiar.org

17. Sustainable Management of Inland Wetlands in Southern Africa: A Livelihoods and Ecosystems Approach

Contact person: m.masiyandima@cgair.org

IPGRI

18. Empowering Sahelian Farmers to Leverage their Crop Diversity Assets for Enhanced Livelihoods

Contact person: r.vodouhe@cgiar.org

19. East African Plant Genetic Resources Network (ASARECA)

Contact person: a.demissie@asareca.org

World Fish

20. Famine Mitigation through Integrated Agriculture Aquaculture

Contact person: j.nagoli@cgiar.org

Non-CGIAR respondents

SADC

1. Initiative for Development and Equity in African Agriculture
Contact person: mblackie@netcom.co.uk

Prof W. Alhassan

2. Integrated Natural Resource Management in West African Crop-Livestock Systems
Contact person: nkarbo@ghana.com

IFAD

3. Program for Combating Soil Fertility Decline to Implement Smallholder Agricultural Intensification (IFDC)
Contact person: amando@ifdc.org
4. Diversification of Smallholder Farming Systems in West and Central Africa through Cultivation of Indigenous Trees (ICRAF)
Contact person: z.tchouredjeu@cgiar.org

CORAF

5. Combining Water Harvesting Techniques and Nutrient Management to Sustain Food Production in the Drylands of West Africa
Contact person: r.tabo@cgiar.org

FANR

6. African Transboundary Institutions (IWMI and IFPRI)
Contact person: a.sullivan@cgiar.org

West Africa

7. Systemwide Program on Integrated Pest management (IPM): Pilot sites on Parasitic Weed IPM in Africa. (with IITA)
Contact person: j.braima@cgiar.org

ASARECA

8. Regional Potato and Sweet potato improvement Programme for Eastern and Central Africa (PRAPACE)
Contact: berga@prpace.co.ug or prpace@prpace.co.ug
9. East and Central Africa Programme for Agricultural Policy Analysis (ECAPAPA)
Contact: m.waithaka@asareca.org or ecapapa@asareca.org
10. ASARECA Competitive Grant System
Contact: c.tizikara@asareca.org

Friederike Knabe

11. ProLinnova Programme in Uganda
Contact: R. Lutalo/F. Kafeero rlutalo@envalert.org/fkafeero@envalert.org

FARA multi-country programme and project review study questionnaire

Introduction

This questionnaire is not designed to evaluate projects, but to extract experiences across a wide range of projects that may help us understand the research process and identify characteristics of successful projects.

The following questions are designed to cover all steps of the research project: problem definition and project conception, research inputs, the research process, the innovation process, outputs, outcomes and impact.

The range of projects we are looking at is diverse and therefore the majority of questions are quite general. Some questions enable you to be more specific to your project but if you would like to include any additional information at the end of the questionnaire this would be very useful to us.

We define a **research project** as a project with an identifiable lead institute, a group of 'users of knowledge', outputs and outcomes. For the purposes of this questionnaire we are looking at either finished or ongoing (but mature) projects.

Users of knowledge (UoK) we consider to be any project stakeholder who may use or benefit from the results/information generated by the research project. UoK include: farmers, NGOs and extension organisations, other researchers in the area, the private sector and policy makers.

Outputs are the tangible knowledge products of research—new varieties, products, practices, policy recommendations, tools and methods. They can be packaged in many ways—in scientific papers, guides, websites, models, etc.

Outcomes are changes in behaviour by anyone as a result of using an output. Examples include farmers changing varieties or management practices, extension staff giving out new messages, changed policies at local, national or international level, marketers trading in new products, etc.

All responses will be treated confidentially and summaries of results in the final review report will not individually identify any specific project.

Instructions

Please answer all questions in relation to the same one named project.

For Yes/No questions please circle appropriate answers.

Name of person completing questionnaire:	
Email address:	
Current institution:	
Name/title of project:	
Host or lead institution for the project:	
Countries in which project operated:	
Start year:	
End year (or 'ongoing'):	

1. Were potential users of knowledge (UoK) identified during project conception? Yes / No
2. If Yes, which specific UoK were identified?

Type of UoK	Which ones (Name/Location)
Farmers	
Researchers (not project team)	
Policy makers	
Private sector	
Government extension services	
NGOs	
Other	

3. To what extent were these UoK involved during project conception?
(tick score that applies)

UoK	Not at all [#]	A little	Partially ⁺	Mostly [^]	Fully [*]
Farmers					
Researchers (not project team)					
Policy makers					
Private sector					
Government ex- tension services					
NGOs					
Other					

Not at all—not consulted or involved in decisions on problem identification

+ Partially—consulted but not involved in decisions

^ Consulted and involved in some decisions

* Fully—involved in all decisions

4. What strategies were used to involve UoKs in any/all aspects of the project?

UoK	Strategy
Farmers	
Researchers (not project team)	
Policy makers	
Private sector	
Government extension services	
NGOs	
Other	

5. Score the extent to which each of the following factors was considering during project conception. (tick score that applies)

Factor	Not at all	A little	Partially	Mostly	Fully
Scale of the problem (e.g. no. of people/ area affected)					
Importance to the UoKs					
Size of potential impact					
Probability of success					
How UoKs will use the findings					
Objectives/aims for dissemination					
Channels for dissemination					
Who will disseminate the findings					
(add any additional factors you considered)					

6. For factors with a score of 'partially' or higher describe who (e.g., researchers, UoKs, funders) assessed these factors and what method was used.

Factor: _____ Who: _____
How/method: _____

Factor: _____ Who: _____
How/method: _____

Factor: _____ Who: _____
How/method: _____

Factor: _____ Who: _____
How/method: _____

Factor: _____ Who: _____
How/method: _____

7. Was there a plan for project Monitoring and evaluation (M&E)? Yes/No

8. If yes, at what stage of the project was the M&E process a) designed and b) implemented? [tick stage(s) that apply]

Stage	a) Designed	b) Implemented
Problem definition		
Proposal writing—defining objectives/hypotheses		
Project implementation		
Production of outputs/publications		
After the end of the project		

9. Did the project have measurable goals and targets? Yes/No

10. If yes, please list the major goals and targets

Goal	Target

11. Who were the researchers (scientists) involved in the project? (tick those that apply)

1. Researchers from the lead institute	2. Researchers from other institutes who had previously worked with the lead institute.	3. Researchers from other institutes who had not previously worked with the lead institute.

12. If answering 2 or 3 to Q 11 then which institutes did they come from?
(list them)

Institute

13. What were the reasons for involving scientists from other institutions
(tick those that apply)

Geographical location	
Expertise otherwise not available	
Costs	
Other	

14. What was the primary source of funding for the project (i.e. the source contributing most funds)? (name donor/organisation) _____

15. What per cent of the total funding came from this primary source? _____

16. What percentage of the total funding was secured at the start of the project?

17. Did any problems occur with the funding? Yes/No

18. If yes, which? (tick those that apply)

Transfers between countries	
Late payment from donor	
Transfer of funds to other institutions	
Accounting for funds spent in other institutions	
Other	

19. When the project was planned, for how many years was it expected to run?

20. Was the time frame for the project changed while it was running? Yes/No

21. Which organisations (apart from your own) interacted on this project?

	Name of organisation	Type of organisation (e.g. NARS, university etc.)
A		
B		
C		
D		
E		
F		

22. What was the nature of your interaction with these organisations?
(tick those that apply)

	Partnership	Paternalistic	Purchasing	Networks	Alliance	Linkages to policy process	Linkages to market
A							
B							
C							
D							
E							
F							

Definitions:

Partnership—joint problem solving, learning and innovation, formal (e.g. MoU) or informal

Paternalistic—delivery of goods, services and knowledge to organisation

Purchasing—of technology or knowledge services from organisation

Networks—information flows between organisations. Formal or informal

Alliance—collaboration in marketing of products, sharing customer bases and infrastructure

Linkages to policy process—specific link to inform and influence policy

Linkages to market—connection to raw materials, inputs and output market 1.

23. Planning of research components (design of research activities such as surveys and experiments) (tick those that apply)

	Research-ers at lead institution	Researchers at partner institutions	UoK	If UoK, list them
Who planned research components?				
Who reviewed plans for research components?				
Who approved plans for research components?				
Who had access to the details of research component plans?				

24. Monitoring research components (monitoring the implementation and performance of research activities) (tick those that apply)

	Researchers at lead institution	Researchers at partner institutions	UoK	If UoK, list them
Who monitored re-search components?				
Who saw the results of monitoring of research activities?				

25. Planning of financial arrangements (annual budgets and expenditure procedures) (tick those that apply)

	Researchers at lead institution	Researchers at partner institutions	UoK	If UoK, list them
Who planned financial arrangements?				
Who reviewed plans for financial arrangements?				
Who approved plans for financial arrangements?				
Who had access to the details of financial arrangements?				

26. Monitoring financial arrangements—monitoring the implementation and performance of financial arrangements (tick those that apply)

	Research- ers at lead institution	Researchers at partner institutions	UoK	If UoK, list them
Who monitored financial arrangements?				
Who saw the results of monitoring of financial arrangements?				

27. Was feedback on the progress of the project obtained from researchers at partner institutions? Yes/No

28. If yes, how frequently? (tick score that applies)

More than once a year	About once a year	Less than once a year

29. What mechanisms were used to obtain feedback from researchers?

30. Was feedback on the progress of the project obtained from UoK Yes/No

31. If yes, how frequently? (tick score that applies)

More than once a year	About once a year	Less than once a year

32. What mechanisms were used to obtain feedback from UoK?

33. At which stage(s) of the research process was the importance/demand of the UoKs re-assessed and did it influence the research design/process?
(tick stage(s) that apply)

Stage	Assessed?	Influence on design/process?
Problem definition		
Proposal writing—defining Objectives/Hypotheses		
Project implementation		
Production of outputs/ publications		
After the end of project		

34. To whom were researchers accountable for progress in the project (for example, own institute, donor, farmers, extension agents, other UoK)? What mechanism was in place for ensuring the accountability?

Researchers accountable to...	Mechanism for accountability

35. Were there incentives built into the project for good performance by researchers? Yes/No

36. If Yes, describe them

37. Which UoK did the project aim to directly deliver outputs to?

UoK	Output (e.g., germ-plasm, agricultural practice, policy brief)	Method of delivery to UoK (e.g. paper publication, training course, policy discussion...)
Farmers		
Researchers (not project team)		
Policy makers		
Private sector		
Government extension services		
NGOs		
Other		

38. Were there other groups of UoK which should have been involved? Yes/No

39. If yes, which ones?

40. How well did the output meet UoK needs? (tick score that applies)

UoK	Not at all	Slightly	OK	Effective	Very effective
Farmers					
Researchers (not project team)					
Policy makers					
Private sector					
Government extension services					
NGOs					
Other					

41. How effective was the method of delivery? (Tick score that applies)

UoK	Not at all	Slightly	OK	Effective	Very effective
Farmers					
Researchers (not project team)					
Policy makers					
Private sector					
Government extension services					
NGOs					
Other					

42. Give one example of an output and effective means of delivery.

43. Give one example of an output and ineffective means of delivery.

44. Was feedback on the outputs of the project obtained from UoK? Yes/No

45. If yes, when? (Tick score that applies)

During preparation of output	On output completion	At end of project

46. What mechanisms were used to obtain feedback on the outputs from UoK?

47. Characterise your institutional learning from this project. To what extent did the following habits and practices **restrict** or **support** the innovation process. (Tick score that applies)

		Restrictive		Supportive
Habits & practices	Scoring scale	1	2	3
Trust	1=mistrust among org 3=high level of trust			
Openness	1=closed to ideas from org 3=complete openness			
Transparency	1=secretiveness among org 3=high transparency			
Confidence	1=lack of confidence in other org 3=high confidence			
Respect	1=lack of respect among org 3=high mutual respect			
Management structure	1=professional hierarchies 3= flat structure among org			
Reflection / learning	1=lack of recognition of failures, 3=learning from both success and failures			
Networking	1=limited interaction in sector networks 3=pro-active networking			
Consultation / participation	1=hierarchies/top-down cultures 3=consultative/participatory habits			
Risk taking	1=conservative 3=professional incentives/confidence			

Abbreviation of 'participating organisations' to 'org'

48. Were all planned project outputs completed? Yes/No

49. If yes, to what extent were these completed according to the project timeline? (Tick score that applies)

None on time	A few on time	Some on time	Most on time	All on time

50. Identify the number of **planned** major project outputs by type.

Project output type	Number
Methods & tools	
Agricultural practices & technologies	
Policy recommendations	
Marketable products	
Germplasm	
Databases & maps	
Other	

51. For each major **planned** output type produced by the project describe the mode of distribution (e.g. journal articles, demonstrations, training courses, policy briefs)

Output	Mode
Methods and tools	
Agricultural practices and technologies	
Policy recommendations	
Marketable products	
Germplasm	
Databases and maps	
Other	

52. Were there also additional **unplanned** outputs produced? Yes/No

53. If yes, identify the number of **'unplanned'** project outputs by type

Project output type	Number
Methods and tools	
Agricultural practices and technologies	
Policy recommendations	
Marketable products	
Germplasm	
Databases and maps	
Other	

54. For each major **unplanned** output type produced by the project describe the mode of distribution (e.g. journal articles, demonstrations, training courses, policy briefs)

Output	Mode
Methods and tools	
Agricultural practices and technologies	
Policy recommendations	
Marketable products	
Germplasm	
Databases and maps	
Other	

55. How would the outputs have changed if the project had

a) double the funds to spend in the same time?

b) half the funds to spend in the same time?

a) _____

b) _____

56. Has there been increased awareness of research findings in media, journals, libraries, public?
 Yes/No

57. To what extent has the project increased levels of debate around its research issues (e.g. in professional journals, requests for information, feedback)?
(Tick score that applies)

No change	Small increase	Moderate increase	Large increase	Now has very high profile

58. For each of the major UoK score the change (adaptation or incorporation of the research findings/results/information) that the project has influenced.
(Tick score that applies)

User of knowledge	No change	Small change	Moderate change	Large change	Completely changed
Farmers					
Researchers (not project team)					
Policy makers					
Private sector					
Government extension services					
NGOs					
Other					

Farmers: Change = acceptance/uptake of new technologies and practices

Researchers: Change = using/adapting new information in their own projects, citing project findings

Policy makers: Change = their policies are based on new information

Private sector: Change = changes in the market chain

NGOs: Change = their activities are based on new information

59. For each of the UoK above with a score of 'moderate change' or higher describe the evidence for this change.

User of knowledge	Nature and evidence of change
Farmers	
Researchers (not project team)	
Policy makers	
Private sector	
Government extension services	
NGOs & extension organisations	
Other	

(e.g. Policy makers—policy changes; Researchers—invitations to project team to attend workshops/for joint work)

60. Describe the impacts of the project that you have observed.

61. Has a formal impact assessment been carried out?

Yes/No

Annex 3. Face-to-face questions

1. What are the characteristics of a successful multi-disciplinary/ multi-stakeholder agricultural or NRM research project? Would it matter if it was a single or multi-country project? Did your project have these characteristics? If you had to repeat this project what would you do differently?
2. What are the characteristics of an unsuccessful project (simply the opposite of A)? Do any of these apply to your project? Do you have an example of an unsuccessful/failed project? Have you ever participated in a failed project?
3. In a multi-stakeholder project, what should be the contribution/ role of: the farmer, extension agent, local policy maker (e.g. leader/chief), NGO, private sector, scientist? What should any of these not do?
4. In the context of your project, who/what did you consider as 'private sector'?
5. Team leadership determines the success or failure of (well planned or poorly planned) research projects. Do you agree, why? Did this affect your project?
6. How do policies of the: donor, organisation (e.g. CGIAR, RECs, SROs, FARA), participating countries, host country; influence the success or failure of a multi-country research projects? Give examples.
7. How can gender or poverty focus affect the success or failure of research projects? Were these important for your specific project?
8. Judging by the answers to Q37, there is a perception that the end user (ultimate beneficiary) of knowledge is the farmer. Is this really true in a commodity chain approach to innovation systems? How about the consumer?
9. In the time frame context of your project or similar projects, is it realistic to expect to achieve impact? If not, what do you think would be a realistic expectation?
10. Multi-stakeholder multi-country research projects are time and resource intensive and the benefits do not justify the time and resource investment. Do you or do you not agree? Why?
11. What were the merits and demerits of our questionnaire? Was there an easier method of obtaining the information the questionnaire was seeking?

ABBI	African Biotechnology and Biosafety Initiative
AHI	African Highlands Initiative
AR4D	Agricultural research for development
ARI	Advanced research institute
ASARECA	Association for Strengthening Agricultural Research in Eastern and Central Africa
ASB	Alternatives to Slash and Burn
BMZ	Federal Ministry of Economic Cooperation of the Federal Republic of Germany
CEEAC	Communauté Economique des Etats de l'Afrique Centrale
CEMAC	Communauté Economique et Monétaire de l'Afrique Centrale
CGIAR	Consultative Group on International Agricultural Research
CGS	Competitive Grant Scheme (ASARECA)
CIAT	International Center for Tropical Agriculture
CIDA	Canadian International Development Agency
CIFOR	Center for International Forestry Research
CILSS	Comite permanent Inter-etats de Lutte Contre la Sécheresse dans le Sahel
CIMMYT	International Maize and Wheat Improvement Center
CIRDES	Centre Internationale de Recherche-Développement sur l'Élevage en zone Subhumide
CORAF/WECARD	Conseil Ouest et Centrale Africain pour la Recherche et le Développement Agricoles/West and Central African Council for Agricultural Research and Development
DANIDA	Danish International Development Agency
DFID	UK Department for International Development
DGIS	Netherlands Development Cooperation
DMI	Desert Margins Initiative
DONATA	Dissemination of New Agricultural Technologies in Africa
ECOWAS	Economic Community of West African States
EPHTA	Ecoregional Program for the Humid and sub-humid Tropics of sub-Saharan Africa
FAAP	Framework for African Agricultural Productivity
FANR	Food, Agriculture and Natural Resources Directorate, SADC
FAO	Food and Agricultural Organization of the United Nations
FARA	Forum for Agricultural Research in Africa
GDP	Gross domestic product
GEF	Global Environmental Facility
IARC	International agricultural research institute
ICIPE	International Centre of Insect Physiology and Ecology
ICRAF	World Agroforestry Centre

ICRISAT	International Research Institute for the Semi-Arid Tropics
IDRC	International Development Research Centre
IFAD	International Fund for Agricultural Development
IFDC	International Fertilizer Development Center
IITA	International Institute of Tropical Agriculture
ILRI	International Livestock Research Institute
INRM	Integrated natural resources management
INSAH	Institut du Sahel
IPGRI	International Plant Genetics Research Institute (now Bioversity International)
IRRI	International Rice Research Institute
iSC	Interim Science Council
ITC	International Trypanotolerance Centre
IVC	Inland Valley Consortium
IWMI	International Water Management Institute
M&E	Monitoring and evaluation
MDG	Millennium Development Goal
MoU	Memorandum of Understanding
NARES	National agricultural research and extension systems
NARI	National agricultural research institute
NARS	National agricultural research systems
NASRO	North African Sub-Regional Organisation
NGOs	Non-governmental organisations
NRM	Natural resource management
OPEC	Organization of Petroleum Exporting Countries
PARC	Pan African Rinderpest Campaign
PRSP	Poverty reduction strategy paper
R&D	Research and Development
RAILS	Regional Agricultural Information and Learning Systems
RECs	Regional economic communities
SADC	Southern African Development Community
SC	Science Council
SCARDA/BASIC	Strengthening Capacity for Agricultural Research and Development in Africa/Building African Scientific and Institutional Capacity
SDC	Swiss Agency for Development and Cooperation
SIDA	Swedish International Development Agency
SRO	Sub-regional organisation
SSA-CP	Sub-Saharan Africa Challenge Program
SWEPs	Systemwide and ecoregional programmes
TAC	Technical Advisory Committee of the CGIAR
TSBF	Tropical Soil Biology and Fertility Programme
UEMOA	Union Economique et Monitaire Ouest Africaine
UNDP	United Nations Development Programme
UoK	Users of knowledge
USAID	United States Agency for International Development
WARDA	Africa Rice Center