



Report of the
Second External Review
of the Sub-Saharan Africa
Challenge Program (SSA-CP)

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Commentary on the 2nd External Review of the Sub-Saharan Africa Challenge Program

January 2011

A review of the Sub-Saharan Africa Challenge Program was conducted by a panel chaired by Dr John Lynam between September-December, 2010. This 2nd Sub-Saharan Africa Challenge Program (SSA-CP) External Review report was submitted to the interim Independent Science and Partnership Council (iSPC) and the Fund Office on December 21st, 2010. The Council thanks Dr. Lynam and the review panel for a rich, intellectual analysis of the Program, the Integrated Agricultural Research for Development (IAR4D) approach, and the progress of the program to-date. The report makes only one recommendation: *The panel recommends an extension of the research phase of the SSA-CP for at least another two years but within the context of some key revisions to the research plan.* **The iSPC endorses this recommendation.** It is pleased to note that the Program management has found the Panel's assessment accurate and is prepared to revise Program implementation if further funding is forthcoming. The iSPC has prepared the following commentary with input from the Fund Office on matters concerning management, governance and finance of the CP.

An important caveat for the review, which also affects the iSPC's ability to comment comprehensively on the success of the CP is that the Program has not yet completed its experimental phase. Due to reasons explained in detail in the report, the inception phase was extended *de facto* to include initial institutional development; the identification of project(s) through a competitive grants process; and subsequent planning of how to test the approach through the use of a randomized control trial (RCT) design. The Review Panel considers that three years (2008-2010) was too short a time to design and implement the methodology of the use of "Innovation Platforms" that are the organizational structure for stakeholder participation, and to adequately test the approach (including a Monitoring and Evaluation system and complete data gathering for "before and after treatment") under variable and complex African conditions. The Panel has, however, been able to evaluate progress to-date, the appropriateness of the research design and the Program's management and governance arrangements.

The iSPC appreciates the complexities of setting up this kind of a Program, with the new institutional arrangements that it requires, and agrees with the Panel's judgement that it was not reasonable to expect the completion of the RCT experiment by the end of 2010. However, the iSPC is pleased to learn from the report that the SSA-CP has succeeded in putting scientific rigor into the concept of IAR4D. The iSPC agrees with the Panel's assessment of the probability of deriving high value from the results and experiences from the Program's research phase once completed. It appears certain that if the Program were terminated now, this would negate most benefits from investments made so far. Such a move would prevent the CGIAR from gaining understanding of the research/development interface in the SSA context. This knowledge is potentially of great relevance for the design and conduct of the CGIAR's future Research Programs (CRPs) and other programs that aspire to take integrated approaches to natural resource management problems in relation to productivity research. Abrupt disengagement could also hurt the partnerships that have emerged and damage the CGIAR's reputation. For these reasons the iSPC considers that it is essential to complete the current research phase and it encourages donors to find suitable funding modalities. The iSPC also recommends that the results and lessons from the Program need to be properly documented, assessed and shared in

order to reap the full benefit from this experiment for the CGIAR and others. We stress that the implications of this experiment with the IAR4D approach go far beyond the SSA-CP itself and have relevance for a number of initiatives within the CGIAR and beyond which are attempting to use analogous integrated action learning approaches but are struggling with the problem of “proof of concept”.

The report covers the history of the Program in considerable detail in order to support its assessment of what has been achieved and also what remains undone or is yet to be assessed. The SSA-CP is of a rather different character from the other CPs developed so far and the history provides a necessary context for understanding the Program’s development. An important step had been the recommendation by the 1st external review to give only conditional approval to the research phase of the CP. The current iISPC considers that, despite the delays in implementing the Program, the earlier commentaries by the former Science Council (SC) and Executive Council of the CGIAR (ExCo) on the Program’s medium-term planning and CP management were important in order for the CP to gain validity as a CGIAR research program. They provided impetus to focus on the central research hypothesis, so that CP results would have broader applicability than simply institutional building and related activities limited to specific sites. To be justified as a CGIAR Challenge Program, the Program needed to address issues and approaches of international significance - particularly for Africa. The Panel has argued that the relative effectiveness of the IAR4D approach could have been an emergent property of the implementation of the SSA-CP, but in the iISPC’s view it was more strategic to use the CGIAR’s limited funds for a time-bound program with clearly defined scientific content. The Panel’s description and analysis of progress so far confirm that the International Public Goods orientation of this Program. Testing a pilot approach is what makes it particularly interesting and relevant for the CGIAR which is going through a reform and reorganizing new programs that aim at effectiveness in generating development outcomes. If the IAR4D approach could be shown to work then it would clearly have very wide application in the CGIAR and in development assistance more generally.

The iISPC acknowledges the critique that emerges from the Panel’s assessment about the validity of the research questions that were initially proposed by the Science Council over and above the main question posed by the 2006 External Review (*Does the IAR4D concept work and can it generate International Public Goods (IPGs) and Regional Public Goods (RPGs) to end users*)¹ and that they be tested through a statistically rigorous methodology within the given time frame. It appears that thorough consultations on the necessary conditions (in terms of experimental design, scientific and financial resource and time, necessary for running such a complex RCT) were not held and that the feasibility of the design given the time and resources was not properly debated by the Program, the SC and the donors. The SC’s expectation of a clear “Yes, IAR4D works”; or “No IAR4D does not work” from this research seems oversimplified but was likely intended to draw focus onto key issues where the Program could add scientific value.

The report suggests that the RCT design has limitations for assessment of the comparative effectiveness between the IAR4D approach and what were termed “conventional approaches” linking new technologies with development purposes. These limitations are partly due to shortcomings in the SSA-CP experimental design where the pre-existing institutional set up,

¹ SC suggested two additional questions: *Does the IAR4D framework deliver more benefits to the end users than conventional approaches (at same level of resources)?; How sustainable and usable is the approach outside the test environment?*

limited number of sites and prohibitive costs, affected randomization. But they are also due to inherent difficulties in selecting control villages subjected to the conventional approaches that are similar to villages receiving IAR4D treatment. An assessment of the RCT methodology is provided in a consultants' report annexed to the Panel's Report, and the analysis benefits from careful discussion in the Report. The consultants' report assesses the way in which the three research questions are being addressed and it is very useful for understanding the feasibility of the research, the results that might be generated and the adjustments that could be made. The iSPC thinks that despite the limitations, the Program should be pursued to provide as good an analysis as possible and to document lessons to address all these questions. The iSPC also thinks that the analysis of the experiment provides a useful contribution to the current intense debate about the use and value of RCTs in development contexts. It may also result in a much more balanced view of how to evaluate results and what methodological improvements are possible. That would help the upgrading of the IAR4D approach considerably.

Notwithstanding these issues of providing a definitive assessment of the IAR4D approach, the Panel has satisfactorily covered the Terms of Reference of the review. The Panel's analysis and assessment of the partnerships in the Innovation Platforms is particularly informative. The achievements of the CP so far are discussed in the Report although largely at the level of the institutional processes and implementation of the experiment. The iSPC finds little quantitative analysis of specific outcomes in each of the 36 IPs, and yet it is on the anecdotal evidence of successful outcomes that the Panel has assessed the potential utility of the approach. Annex 5 lists achievements from all the 36 IPs to-date, most of which are process outputs but which also include benefits, for instance, in market access, access to inputs, enhanced capacity and adoption of some NRM practices. Other than the annex, there is little assessment of the nature of the innovations and products accruing from the IPs and how they indicate the value added from the IPs, although this is alluded to. The Panel concludes on the basis of its visits to the IPs and interactions with the program stakeholders that the IAR4D is a significant institutional innovation and that the SSA-CP is implementing the IAR4D through a coherent methodology. The final conclusions on the benefits from the approach are pending and dependent upon the completion of the experiment.

The report is somewhat lacking in its discussion of the likely cost effectiveness of IPs although, as mentioned, so far there is only limited information of the realised benefits from the IP structures. Whilst the Review Report provides an appealing analysis of several of the issues that might influence the scaling up of IAR4D, the iSPC would have liked more specific discussion of scaling up, in relation to predictions on costs and sustainability of the approach and platforms that could be made on the basis of the pilot experiment. Some expansion of the activities within the current Pilot Learning Sites is apparently taking place. The iSPC thinks that it will be important to understand the sources and full extent of transactions costs for a proper consideration of the feasibility of scaling up. It is clear from the report, that significant capacity building is required for establishing IPs and that this is an important factor in their sustainability. The iSPC agrees with the Panel that assessment of factors that would affect scaling-up strategically could be added to the Program's agenda for completing the research phase. These could include issues of the temporal trade-off between production, market and natural resource cycles. The iSPC also agrees with the Panel's view that the CGIAR's role is important in this piloting experiment of the IAR4D. It is noteworthy that the SSA-CP has been the only CP led by an organization outside the CGIAR (FARA) having its partnerships span a wide range of primarily African organizations of different kind and at all levels but with a relatively minor part played by the CGIAR Centers. It may be wise to see how the approach can be further developed with regional institutional

support, for instance connecting with intermediate organizations such as AGRA. It is interesting to learn from the FARA/SSA-CP response about the discussions on using the IPs established by the Program as a complementary framework to facilitate implementation of the CAADP Investment Plans.

The Fund Office welcomes the Panel's assessment of the governance, management and finance aspects of the SSA-CP. The issues related to the financial relationship between SSA-CP and FARA, the risks imposed by the narrow funding base and irregularities found and corrected in order to adhere to good accounting practice and transparency of decision making, have been well covered in the report and in the consultant's report on finances. The Panel saw no need to make structural modifications to the Program's oversight arrangement at the regional level. In two of the other CP reviews, major changes were recommended particularly to resolve conflict-of-interest issues related to the membership of the governing bodies. It is assumed that such issues were not identified with the SSA-CP. The Fund Office supports the Panel's suggestion that FARA monitor the fiduciary framework that the Consortium may adopt in the future and adopt into its financial management systems any best practices that might emerge.

It was not possible for the Panel to evaluate the SSA-CP's exit strategy as the research phase is in mid-course and the Program management has given little consideration to what would happen after the current funding runs out. The iISPC would have expected the Program to prepare itself in the face of CGIAR transition where bilateral funding through the formal CGIAR arrangement of the Fund is not possible. Without any strategy, the program faces abrupt closure unless it can at this stage rapidly secure further funding. The Program should develop an exit or expansion strategy (to respond to the results of the research) before the extension of the research phase comes to an end.

The Panel's interesting discussion of the Program's potential future, including an exit or transition strategy from being a CGIAR CP, contains two quite different trajectories; namely using the IP structure either for further research on specific development issues or for the scaling out of the IAR4D approach. The CGIAR's role in both is discussed. The iISPC agrees that the scaling out would take place through transition to national frameworks. A critique by the Panel is that insufficient preparation has been exercised by the CP in developing cross site learning and synthesis of results. The CP management response suggests that this will be addressed. The CGIAR Centers have played a significant but relatively minor role in coordinating and implementing large parts of the SSA-CP activities, but transfer of coordinating responsibilities to regional organizations has already happened. However, the research trajectory, as discussed, could offer interesting opportunities for the CGIAR, particularly if some of the CRPs will focus on integrated systems issues and involve research on the research-development interface and partnerships. In any case, it will be important for the CGIAR to engage in the debates of integrated research for development and scaling out as part of its impact pathway discussions in the design of all new CRPs.

In summary, the iISPC supports continuation of the Program to enable the collection of the planned final data and the completion of a rigorous analysis of the potential of the IAR4D approach. The iISPC also encourages the use of the existing opportunity, and the human capacity that has been developed, to expand this analysis to look at factors that limit development and affect scaling-up of research and development interventions. Understanding these limitations will be crucial for paving the way to new technologies and research results that impact local welfare. Issues such as insufficient guarantees of local and regional markets are central to the

focus of this program. Experiences are emerging, (for example from AGRA and IFDC) that show how science and knowledge can be mobilized for developing successful entrepreneurial-based initiatives. It is important for the CGIAR and others engaged in research for development particularly in sub-Saharan Africa to gain from the different experiences, and the investments already made by the CP and other initiatives for improving the effectiveness of their work.



**Sub Saharan Africa
Challenge Programme**

Securing the future for Africa's Children

**Response from FARA and SSA CP to the report of the
Second External Review of the Sub-Saharan Africa
Challenge Program**

January 2011

Second External Review of the Sub-Saharan Africa Challenge Program: Response from the Sub-Saharan Africa Challenge Program

Opening

The Forum for Agricultural Research in Africa and the whole of the Sub-Saharan Africa Challenge Program Team acknowledge with thanks the receipt of the final report of the Second External Review of the Sub-Saharan Africa Challenge Program (SSA CP) undertaken by Dr John Lynam (Chair) Dr Karl Harmsen and Dr Paramjit Sachdeva with additional inputs from Professors Alain de Janvry and Elizabeth Sadoulet and Mr. Emmanuel Burnley.

We are thankful to the Science Council of the CGIAR for giving us the go-ahead to proceed into the proof of concept research phase with dedicated questions to be answered. We are equally grateful to the Interim Independent Science and Partnership Council of the CGIAR for commissioning the second review the report of which is the subject of our commentary.

In our own opinion, the whole review team is eminently qualified and they have put together a good methodology for the review which combined desk review with use of structured questionnaire, observation, focus group discussions, and key informant interviews. The Program Coordinating Unit was not invited to undertake the field visit with the team. But this, rather than reduce the validity and thoroughness of the review has actually increased it.

The SSA CP is a complex Program which is looking at the concept of IAR4D which in itself is not any less complex. We have taken the report as the team's interpretation of the Program and that of IAR4D methodology which was used in the work following the short visit during which the review was undertaken. Given the short period at the disposal of the team, and the complexity of the program and the IAR4D methodology, we consider their interpretation to be impressive. The commentaries that we have made will fill the gaps and improve the understanding of the program and that of IAR4D.

Factual Corrections

To begin with, we would like to make some factual corrections which in any case are not a criticism of the review but a good reflection of the complexity of the work undertaken by the panel. Most of the corrections however do not affect the validity of the more fundamental recommendations that have been made by this eminent panel.

1. In giving an overview of SSA CP Management structure in section 3.1, the panel indicated that “...Accra-based FARA Secretariat staff were assigned responsibility for SSA CP’s financial management, administration, and human resources; and a small Core Research Support Team (CRST) was appointed for facilitating program implementation, monitoring, and evaluation, and for undertaking the cross-site meta-analysis project...” We just want to say that in addition to financial, administration and human resources, FARA also, through the PCU and with the Program Coordinator as the arrow head is responsible for the facilitation of program implementation leaving data management, monitoring and evaluation, and the cross-site meta-analysis project to the Core Research Support Team (CRST). The Program Coordinator is also a member of the CRST as the Specialist for IAR4D. This is to fill the gap on the knowledge of IAR4D realizing that CRST members who are experts in their respective areas shown in Fig 3.1 may not have good knowledge of IAR4D. FARA also coordinated the activities of the CRST until recently when this responsibility was devolved to one of the members.
2. This takes us to the issue of the engagement of the CRST members which was mentioned in 2.5. The panel opined that “...However, the CRST is based on individual scientists and not on buy-in by individual centers...” We just want to clarify that each CRST member was recruited following an agreement between FARA and their host institutions. In each case, the agreement details all deliverables including the time and financial commitment. Conflict arises only when the host institution is unable to release the member for the time requested as was the case with the member based in ILRI who gave us 60% of her time when she was in CIAT and could not give more than 20% after she crossed over to ILRI.
3. Figure 3.2 shows the analysis of contributions made by donors of SSA CP between 2005 and 2010. We just like to add that shortly after the review was completed, Italy sent the sum of Euros 200,000 being their contribution to the activities of the SSA CP for the year 2010. This thus makes Italy the second Donor after the EC that contributed to the Program from inception till year 2010.
4. Section 4.4 details recommendations for Research Phase of SSA CP. In the concluding part of 4.4a, the panel in recommending a full time scientist with experience in the type of research done in SSA CP opined that “...there is hardly any SSA CP scientists, apart from the Coordinator, who have a comparative sense of how IAR4D is being implemented across the three PLSs...” We say that while it is true that the Coordinator has an overview of IAR4D implementation across the PLSs, other scientists in the PCU and the CRST also have this comparative sense. The PCU with the Coordinator as the arrow head facilitated the translation of the IAR4D from concept into practice by the PLSs. This was done through several workshops which were complemented by a follow-through strategy that ensured that IAR4D was implemented with enough space for adaptation to local settings. This strategy indeed brought to being all the diversity we observed in the implementation across the PLSs while the basic principles were adhered to. Having said this, the recommendation to develop a more complete vision of SSA CP also in the Task Force Leaders is welcome.

Commentaries

Having made the few factual corrections we would now go into the content of the report and make a few commentaries mostly to improve the knowledge of our Program.

1. On the Recommendations:

FARA appreciates the logic posed by the panel and would like to say that we accept all the recommendations advanced in the report. We agree with the analysis of the panel on the importance of allowing the work to continue for two more years. Besides the fact that this would enable us complete ongoing research and development activities across the sites, thereby sustaining the integrity of the CGIAR and other partners especially among rural and urban dwellers including non-traditional ARD partners like the private sectors and policy makers, it would also allow some of the outcomes that we have noticed from IAR4D metamorphose into indicators for impact for a rigorous measure of the effectiveness of IAR4D.

We share the sentiments expressed in section 4.4b showing the downside of not extending the research phase. To the long list of compelling reasons why the project has to be extended we would like to add the expectations of the African Union (AU) and CAADP partners. SSA CP's Innovation Platforms are currently being looked at as a possible complementary framework to facilitate the derivation of impact from CAADP Investment Plans. The CGIAR through the SSA CP work holds a vital key to the demonstration of how these platforms should be organized and run to best serve the purpose of CAADP which is an important program for the African Continent.

Consequently, we would like to reinforce the recommendation of the eminent panel for a bridging fund to enable SSA CP activities to continue from January of 2011 without any break.

We accept the 4 proposed issues to be included on our agenda as listed in section 4.4a as well as the additional researchable issues aiming at improving how IAR4D works. We also accept the recommendations on financial management and those related to improvement on lessons sharing which as a matter of fact we currently run on annual basis. We believe this could be encouraged at the PLS level as well especially for ZMM and KKM where the Task Forces are working somewhat separately. All these would improve benefits from the investment already made in our work.

2. On the position of Research

In Box 1, the panel report shows the defining characteristics of Innovation Platform.

What we find missing here is the complementary activity performed by the Platforms. Each platform is supposed to go beyond productivity and also include Markets and NRM as indicated in many parts of the document. These are missing in this list showing defining characteristics of Innovation Platform. But we have also found out that besides these, for the IPs to be relevant in solving problems of African agriculture and thereby promote agricultural development in the continent, they also need to integrate product development, policy and gender. All these are also missing from the list. From our experience in SSA CP, we have realized that to make progress in Africa, ARD needs to consider productivity, markets, policy, NRM, product development and gender. IAR4D creates a mechanism for this integration as we will soon point out. Suffice it to say here that the fact that no single CG Center has the full complement of expertise to run through all these disciplines should not be an extenuating factor preventing adoption but rather as a strong pointer to the importance of partnerships in this dispensation.

Number 4 on the list in Box 1 indicates a few activities as key role of IPs. These include *..”helping farmers get access to credit, improved seeds, fertilizers and agrochemicals.....”* We want to say that

all these activities mentioned here are related to the development component of the IP which works towards the resolution of non-technological or developmental constraints on the IP. The missing gap can only be filled by research which is the only vehicle to resolve technological or research-related constraints on the IPs. We believe that many technologies with great potentials have not been allowed expression due to non-technological constraints related to institutions and policy etc. The main crux of IAR4D is to consider development related constraints as we look at the research-related constraints in order to promote innovations. This is the main strategy that ensures that whatever products come out of the platform are not hindered by development constraints. The inclusion of research on the platform will resolve current problems and those that would emerge later thereby pushing the overall productivity of the system higher from one cycle to the other. This thus entails that besides the benefit of creating an access to delivery mechanisms for products coming from IARCs as contained in characteristic number 5, IPs are a veritable mechanism for the development of new products and adaptation of old ones.

3. Integrating Productivity, NRM and Markets

The importance of the integration of research and development at the level of productivity, markets, and NRM is not lost for ARD practitioners. What has been missing is the mechanism to get the disciplines integrated in a way that ensures innovations in a sustainable manner. IAR4D provides an example of how this integration could be done. But besides these three disciplines, we also think that the integration of policy, product development and gender are crucial in Africa as we have argued above. It may be argued that product development is a part of markets but if it is not given prominence we will miss a big component that could make IAR4D to be sustainable over the long term.

The panel opined in section 4.2f that no clear agenda was seen at any of the IPs visited for the integration of any of these. We argue that elements of this integration are there at the platform level in each of the 36 IPs across the program. In general, IAR4D looks at productivity as driven by effective market demand on the spine on NRM and sound policies. These are backed by product development and gender considerations. This is the plan but I admit that for lack of expertise in most of the areas, each platform has had to limit itself to those areas where they readily could function. The inability to garner enough expertise is partly due to dearth of expertise within the region in the areas specified. But this could also be seen as strength of IAR4D and its flexibility in terms of expertise required before commencing activities. If we have to wait until we have all the domains of expertise present before we commence IAR4D it is clear that some countries in SSA will never commence for lack of critical mass of expertise.

The gap in getting required expertise closes up with extended partnerships which may be through regional collaboration the type that we saw in Lake Kivu where the Task Forces are working together across the countries. In this case, one country complements the needs of the other as much as possible. Be this as it may, we still had in many locations at least a strong linkage and integration between productivity and markets (fattening and markets in Southern Niger and Northern Nigeria; vegetables in ZMM; sorghum productivity and market in Lake Kivu). In some other cases, between productivity, market and NRM (Maize, ISFM and markets and Maize, Continuous Agriculture and markets both in ZMM); and between productivity, product development, and market as we had in Lake Kivu in the case of Sorghum and Mamera drink which has now been developed for the super market. If productivity levels of targeted crops in the sites have not been moved to higher levels, it is not because IAR4D does not support increase in

productivity or does not have a well defined mechanism to get this done. This is because we have only operated for a short period of time, too short for us to embark on long term varietal development programs. In a previous work on IAR4D in Northern Nigeria, farmers at the end of the first season made a request for a higher yielding sorghum variety. This request took the scientists involved in the work back to the drawing board of varietal development using all kinds of tools including biotechnology. We are convinced that when a new variety is introduced through this means, productivity may be increased for each of the 40,000 farmers participating in the nested IP. We will look at this much more closely later.

4. Scope in IAR4D

In Section 2.4 the panel discussed the implementation modalities for IAR4D and opined that scale is something of a choice criterion in the establishment of the IPs. This is quite true but the scale is determined first by the size of the output market, as well as the extent of partnerships required which in itself is based on potentially identified constraints. Since partnerships are based on identifiable constraints, the larger the potential constraints to innovation in any particular setting the larger would be the size of the IP in that location. Contrary to what was thought, all our IPs are organized at the village level. In this way, they take inputs from the policy makers who are at the Local Government level which is the nearest administrative level to the platform. Scaling up and out from this point will require an expansion of the output market with a concomitant expansion of the producer base and geographical coverage. These could be strengthened by developing strategic IPs at higher levels of administration to complement the operational IPs.

The panel has identified that the SSA CP framework has presented a broad comparative structure. This is largely due to the approach used by FARA in getting partners to get the project into implementation. FARA's strategy of following partners through as they turned principles to practice ensured that each partner was able to adapt the principles to its operating environment. KKM thus evolved differently from Lake Kivu in tapping into administrative structures and hence got the highest inputs than any other PLS from administrators. They also moved closest to influencing micro level policies on ARD. Besides, where existing institutions and their staff members have been used, they undertake the "old business" in an "unusual way".

The success of Lake Kivu in pulling all Task Forces to work together is indeed remarkable. But this is not to show that efforts were not made to get other PLSs to move in a similar direction. The failure of other PLSs to attain harmonization was partly traceable to the membership of those PLSs which included multiple IARC partners each of which looked strong. CIAT was the only dominant IARC partner in Lake Kivu. This therefore throws light on what may constitute a potential threat to the operations of CRPs.

In all, we are thankful to the panel for the identification of a number of research areas to enable us take full advantage of the broad comparative structure of the SSA CP. As has been rightly pointed out, our current focus is on the proof of concept and we know that we could revisit some of these

issues even after the proof. For the moment, we have only been able to open up comparative studies in a few areas taking advantage of collaboration with other agencies. Our studies on IAR4Dness and social capital through partnerships with the University of Wageningen are steps in this direction.

5. RCT and Scientifically Rigorous Research Design

The panel raised a few issues about our choice of RCT for the proof of concept. We would like to say that our choice was based on a wide consultation on possible options. The challenge that was posed to the SSA CP was to develop a scientifically rigorous proof of the concept of IAR4D for which many people recommended a factorial design among others. It was through a careful consideration of applicability, relative benefits and costs that we arrived at RCT. RCT design may be expensive but not as expensive as some other suggested designs which could equally provide a rigorous proof.

We believe there has been a misunderstanding about how IAR4D has been applied. We did not use districts as the unit of randomization. Instead, we stratified at the district level and randomized at the level of individual villages. This implies we have no less than 180 treated villages (and equally large numbers of control and conventional villages), spread out across 9 task forces in 3 regions. We believe this number is sufficiently large for impact assessment.

We recognized that issue of sample bias is potentially serious. The crux of the problem is that IAR4D villages were (randomly) selected from the sample of clean villages. If clean villages are systematically different than conventional ARD villages, then a straightforward *ex-post* comparison of IAR4D and ARD villages conflates these initial differences and the impact effect. We will proceed along two routes. First, we will analyze in detail to what extent “clean villages” were indeed initially different than conventional ARD villages. For this purpose we will retrieve the actual selection rule applied by the team that carried out the selection, if any, when deciding whether to engage with a certain village (turn a clean village into a conventional ARD village), or not. Based on these characteristics we will compile a list of observables, and systematically compare the *ex ante* (baseline) information collected in the clean and ARD samples. If these data suggest our sampling design introduces selection bias then we will proceed with route 2, which is to adopt a matching method in order to create a credible counterfactual. Either way, the project will generate credible results.

It is important to emphasize that we never anticipated to be able to measure impact via a simple “comparison of means.” Partial compliance, for example, would necessitate an instrumental variable strategy. We have always intended to take selection on observables and unobservables very seriously. In the research plan (and in the detailed response to the various comments) we elaborated on this issue.

The panel also showed concern about the unit of analysis of the conventional approach, comparable to IPs used in IAR4D. The fact is that there is no such comparably compact framework for analysis

of linear mode of ARD. Changing this and introducing a compact unit of analysis would amount to giving linear approach a new “face”. We decided not to create “artificial conventional villages” partly for budgetary and operational reasons and for non-clarity on how this would add value. However, it is our belief that both approaches impact lives at both the household and village levels and these are the areas we are monitoring for the assessment of relative usefulness. Contrary to what the panel suggested, we had sufficient resources to monitor chosen conventional villages and the data collected from these villages will help us determine the extent of usefulness of IAR4D.

The other issue raised by the panel which we would like to respond to is the issue of how we intend to prove the third hypothesis related to scalability of IAR4D. This is the issue of external validity of the approach. As shown in our 2009-2010 MTP, our proposition is that “if the design and estimation show that IAR4D works in different contexts then it can be extrapolated outside the test environments”. The pilot study encompasses a range of contexts, and is representative for a range of farming systems in Africa. It is an open question whether the IAR4D approach is equally effective across this entire range. It is our belief that RCT could be used in proving this as well as other two hypotheses.

6. CGIAR and the research to development continuum

The panel expressed the view in section 4.1a that “....CG Centers have little future role in IAR4D implementation i.e formation of IPs beyond this piloting or developmental phase..”. We do not share this opinion. We would like to go back to our understanding of IAR4D as a mechanism or a methodology to integrate research into development in such a way that research constantly gets inputs into the development of its agenda and an outlet for its outputs. We believe that the CGIAR requires this in order to be constantly relevant. More so now that this same framework has demonstrated its complementarity with the CAADP framework. Although the concept is yet to be proven using indicators of impact, going by what we have seen from all the PLSs and the preliminary analysis of data from Lake Kivu, the potential of IAR4D for poverty reduction is very high. To us, the utility of the methodology in integrating different disciplines of key importance for the growth of African agriculture, and as a veritable poverty reduction strategy have put the question beyond whether the CGIAR should be involved in IAR4D work and in creation of IPs.

The fact is that IAR4D engages different kinds of research and not just adaptive research alone even if adaptive research is the mode that provides ready entry point. When we did the Sorghum work in Northern Nigeria with 40,000 farmers, the entry point was adaptive research but this quickly changed to basic research as the farmers demanded for a higher yielding variety of Sorghum at the end of the very first season after conducting participatory cost and benefit analysis with stakeholders on the nested IP. The basic research of CGIAR partners on Striga is of relevance to the IPs in the KKM working on maize and could influence the choice of a new variety to be integrated into the IPs. Products from topics like this would have been more relevant and more readily available for use in reducing poverty should they be determined through the operations of the IPs. Beyond productivity, we could say the same for other domains of research – NRM, markets, policy, product development and gender- that are crucial to African agriculture.

What FARA did was to serve as a coordinating center for IAR4D work cutting across 8 different countries in Africa. Although the 36 platforms that emanated from the work came on different subjects, we posit that they could easily have come on just one common subject had that been our desire. SSA CP plans to aggregate work from the 36 platforms leading to the mega project and the meta-analysis. Similar mega projects could emerge from an aggregation of work from multiple platforms across the mandate area of the CGIAR on mandate commodities. This is not to suggest that the CGIAR should undertake everything but to amplify that through carefully and purposively formulated partnerships, such that does not distance the CGIAR from other partners, the IAR4D could become a veritable methodology that would make the CGIAR more visible with demonstrable higher returns on investment.

7. Closing

FARA is grateful to the CGIAR, the Independent Science and Partnership Council and to our Donors for partnering with us on the SSACP. We are also grateful to the review panel and for their conclusions.

We believe a rigorous test of the impact of IAR4D constitutes an important global public good – the information collected in this project should inform ARD practitioners and decision makers in the domain of ARD worldwide. Based on data collected until now we are optimistic about the scope for delivering such a “proof of concept.” The Lake Kivu data are consistent with the hypothesis that IAR4D is associated with reduced poverty. The next challenges are identifying the mechanism via which IAR4D “works” and identifying the types of beneficiaries who stand to gain most from this approach. Based on monitoring and evaluation data -collected continuously at all innovation platform levels – we will also construct an index of “IAR4D-ness” and use this information to analyze which specific components of the IAR4D approach are crucial for success.

We agree that an extension is required for us to complete this work and that a funding bridge is desperately needed to continue field work from this January.

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December 21, 2010

Dear Dr. Rabbinge and Ms. Douglas,

It is my pleasure to submit to you the panel's report representing the findings of the external review of the sub-Saharan Africa Challenge Program (SSA-CP). Also, on behalf of my other panel members, Karl Harmsen and Paramjit Sachdeva, I would like to thank you for the opportunity to undertake this review. We found the SSA-CP to be a complex program that is working through a range of very important research and implementation methodologies that are at the cusp of how to undertake agricultural research for development. This report in fact has two strands, namely a review of the SSA-CP itself and an assessment of integrated agricultural research for development (IAR4D), the principal methodological framework being used by the SSA-CP. The panel, itself, learned quite a lot about IAR4D in undertaking this review and it is our wish this intellectual excitement is reflected in the findings within the report.

At the same time the panel would like to acknowledge the many people who assisted organizing this review. We especially thank Dr. Sirkka Immonen of the Science Council Secretariat for organizing and backstopping the panel during its field work and for being a sounding board as the report was being drafted. The report would not have been possible without the active support and participation of Dr. Monty Jones, executive director of FARA, during the panel's two visits to FARA headquarters. He fully participated in both meetings with the panel. At the same time the panel would like to specially thank the SSA-CP coordinator Adewale Adekunle and his staff for their excellent support during the course of the whole review. The field visits in each of the three pilot learning sites were facilitated by a cast of hundreds who unfortunately must remain nameless but who nonetheless went out of their way to present the SSA-CP in depth. Finally the panel would like to thank the consultants who brought their expertise to bear on issues outside the expertise of the panel, namely Emmanuel Burnley on finance and Alain de Janvry and Elisabeth Sadoulet on the design of the randomized control trial (RCT) for proof of concept of IAR4D.

The report offers the panel's interpretation of the rather unique history in the development of the SSA-CP and the continuing impact this has had on the program. It goes on to provide an assessment of IAR4D, which the panel feels offers significant potential as a framework for integrating productivity, NRM and markets in impacting on smallholder welfare in an African context. The application of an RCT design to test the proof of concept of IAR4D is unique within the CGIAR in the scope of trial and its application to agriculture in Africa. These two areas offer a series of lessons learned that are explored in relation to the current ongoing reform of the CGIAR. Overall the panel finds the SSA-CP to

be a vibrant and well managed challenge program exploring a range of issues central to smallholder development on the continent.

Because of the uncertainty of all challenge programs during the reform process, the panel makes only one recommendation, which essentially argues that the program requires at least two more years to complete the research agenda that the SSA-CP has set for itself. The panel feels that to terminate the program at this stage would risk not only the goodwill that has been built up for the CGIAR in the implementation of the SSA-CP but as importantly not capturing the return on what has been an innovative investment by the CGIAR. The panel would see the SSA-CP as a potential launching pad for a range of interesting research areas; that is if the program is allowed to finish its current research in good order.

With very best regards,

A handwritten signature in black ink, appearing to read 'John Lynam'. The signature is fluid and cursive, with a large initial 'J' and 'L'.

John Lynam
Panel Chair,
Second External Review of the sub-Saharan Africa Challenge Program

**CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH
INDEPENDENT SCIENCE AND PARTNERSHIP COUNCIL**

**Report of the Second External Review of the Sub-Saharan Africa
Challenge Program (SSA-CP)**

Review Panel: **John K. Lynam (Chair)**

 Karl Harmsen
 Paramjit Sachdeva

**ISPC SECRETARIAT
DECEMBER 2010**

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Executive Summary

The sub-Saharan Africa Challenge Program (SSA-CP) was very much business unusual for the CGIAR. The SSA-CP was coordinated by the Forum for Agricultural Research in Africa (FARA). The program focused on generating impact in smallholder agriculture in a particular region, sub-Saharan Africa, through a process termed integrated agricultural research for development (IAR4D). IAR4D has its roots in both INRM and innovation systems and is implemented through hierarchical structures called innovation platforms (IP's). These IP's in turn were a mechanism for integrating innovations in productivity, markets and natural resource management. The program operated in three large, multi-country benchmark sites and became a vehicle for integrating the research outputs of a large number of CGIAR Centers. This report reviews the SSA-CP in some detail and given the issues that the SSA-CP deals with, draws lessons for the current CGIAR reform process.

The Development and Design of the SSA-CP: The history of the SSA-CP can be divided into a three-year inception phase and a three-year research phase. What was to be a two year inception phase focused on institutional development was extended to three years until an acceptable research plan was produced. After the external review of the inception phase there was a period of a year in which the SSA-CP and the CGIAR Science Council/ExCo negotiated the structure of a research plan. The research plan eventually focused on testing the effectiveness of IAR4D by imposing a randomized control design (RCT) on the implementation of IAR4D in order to provide proof of concept. This uncertain and relatively weak start to the program undermined initial partner buy-in and generated external perceptions that the program was floundering, when in fact there was very effective program implementation, once the research plan was agreed. However, this period of iteration around project design has limited actual implementation of both the research phase and IAR4D itself to only three years. The review argues that the research phase has been a very good investment but the time period for IAR4D implementation has been unrealistically short.

Focal Areas for the Review: The review focuses on three principal areas, namely: (1) the overall effectiveness of IAR4D with a sub-Saharan Africa context, (2) the validity of the research design in the "proof of concept" of IAR4D, and (3) governance, management, and finances of the SSA-CP. The field work for the review consisted of visiting all three Project Learning Sites (PLS), which in turn consisted of three task forces (TF), each of which facilitated the development of four IP's. Member of the panel met with all the TF's and interviewed half of the IP's. Because of the relative unique history in developing a research agenda and the effect this has had on perceptions of the SSA-CP, the report begins by reviewing the principal steps and decision making that led to the current program structure.

Effectiveness of IAR4D: There is much discussion in the international development community of IAR4D but very little in terms of actual work on the ground for gaining an understanding of how to implement this paradigm. The SSA-CP provides the most ambitious effort to both implement and evaluate IAR4D and this is done in the context of sub-Saharan Africa. In fact, the SSA-CP chose some of the agricultural areas with the highest poverty rates, poorest market access, and weakest institutional support, from eastern Congo to northwestern Mozambique to southern Niger. The SSA-CP took the principles of IAR4D and translated those into a coherent methodology for implementation in the form of innovation platforms facilitated by task forces made up of CGIAR centers and other partner organizations.

The IAR4D methodology envisages that proper implementation of the concept have the following characteristics: (1) a functional linkage point between farmers, private sector, and service organizations, (2) integration of productivity, NRM, markets and policy, (3) an efficient modality for organizing farmers, (4) an effective mechanism for knowledge transfer to farmers, (5) action research

oriented toward problem solving and impact, and (6) bottom up organizational development. Based on the panel's field visits, the panel notes that the IPs have to varying degrees achieved a functional partnership across quite different organizational actors, a bottom-up approach to problem diagnosis and testing of potential solutions, real ownership by farmers and other actors of the IP, and a framework for integrating innovations in productivity, markets, and NRM. These would be intermediate indications that the IAR4D concept is functional within the sub-Saharan Africa context and moreover, an experimental design has been imposed to provide a rigorous test of whether IAR4D does produce impact.

In the three year research phase from 2008-2010 the program has developed credible implementation modalities for IAR4D, has established 36 innovation platforms across a broad spectrum of agricultural systems in sub-Saharan Africa, has implemented a complex experimental design to test proof of concept, and has put in place the baseline survey, M&E methodology, and an analytical support team to implement the RCT. This is a highly credible output but the period was too short to produce a definitive answer to the proof of concept.

Evaluation of the Research Plan Focusing on Proof of Concept of IAR4D: A sophisticated randomized control trial (RCT) design was imposed on the implementation of IAR4D to test proof of concept. This is considered the gold standard in the evaluation field but in 2007 there was little experience in applying these methods in agriculture and almost no experience within the CGIAR. There was thus a learning process involved in the implementation of the RCT approach within the SSA-CP. The SSA-CP's research design was based on the three questions posed by the Science Council in its commentary on the external review of 2006. Were these the right questions? The first question on the effectiveness of IAR4D is a central question. The RCT is well designed to answer this question, although there are probably less expensive alternatives. The second question comparing IAR4D to traditional linear approaches was in many respects a central question and could only be done within an RCT approach. However, there are a range of complexities to this question that make the RCT approach particularly difficult and expensive, and in turn raise the succeeding question of whether the cost would justify the value of the information obtained. Finally, the third question of whether these results can be scaled out is not possible to answer within an RCT design.

All the issues inherent in applying an RCT design are brought out in comparing IAR4D to conventional "linear" methods in the second research question. First there is the issue of what is being compared. Are IPs compared to traditional extension methods, such as Training & Visit? But, that does not provide an appropriate evaluation of the extent to which research links to extension, even if in a "linear" mode. If linear systems were to be assessed, what would be the unit of analysis, comparable to IPs in the case of IAR4D? The SSA-CP never effectively assessed this question, relying instead on what was currently being practiced in the PLS target areas without developing a method to assess conventional approaches. This was primarily due to lack of sufficient budgets to monitor conventional sites, much less define what a conventional treatment unit might encompass.

Second was the difficulty of defining and sampling a counterfactual conventional site without selection bias. The SSA-CP design introduced possible biases by comparing randomly sampled IAR4D sites with existing conventional sites. The panel notes that a fully randomized RCT comparing conventional R&D and IAR4D would probably have doubled the budgetary requirements and at the same time, given that the treatment units were defined at a district level, would have required significantly increasing the size of the benchmark sites, which in itself would have substantially increased logistical costs in implementing the design. The panel's view is that comparing two R&D systems within a RCT design would have been far too expensive to justify the costs, even if the conventional system could be appropriately specified. However, using the RCT to evaluate whether IAR4D will produce impact on

development outcomes is valid within the current design. However, it requires more time than three years to establish the IP's, introduce and test innovations in the area of productivity, markets and NRM, and then impact on farm level productivity and incomes.

Governance, Management, and Finance: The panel's findings in the area of governance, management and finance can be summarized as follows:

(1) The mid-term change in governance structure from a steering committee to oversight by the program committee of the FARA board did not radically change oversight given the participation of representatives of CGIAR Centers and the Alliance on the program committee or as technical advisors/resource persons to this committee. Moreover, the change reduced administrative costs of governance of the SSA-CP.

(2) For such a complex program, management costs have been kept at a sufficient minimum, without undermining the effectiveness of program implementation. The panel does note significant staff turnover in many parts of the SSA-CP, particularly in staff seconded by some partners, including some CGIAR Centers, due to circumstances only partially-related to the SSA-CP.

(3) An independent financial review was undertaken for the review panel and shows that financial management of SSA-CP funds has improved in recent years, is generally satisfactory at present, and further improvements on some aspects are ongoing or are planned.

Summary and Recommendation: The SSA-CP in the three years of the research phase has implemented a sophisticated RCT experimental design, designed and implemented an IAR4D methodology, executed the baseline survey, put in place an effective M&E framework, and completed an "endline" survey in Lake Kivu PLS which has been partially analyzed. This by any measure is an impressive set of research outputs in a three year period under the institutional and operational conditions found in many of the PLSs. The panel finds that a three year time period to establish proof of concept is unrealistically short, that is, to establish that development outcomes are achieved at village and farm level and these be expressed in double difference between baseline and endline conditions in treated and control villages. At this point the panel can only base its assessment of IAR4D on its field visits. The enthusiasm of the task force members, the articulate expression by farmers of changes in behavior and material conditions at farm level, and the preliminary findings from analysis of the Lake Kivu endline survey have persuaded the panel that there is sufficient potential in the IAR4D approach to argue for an extension of the research phase for another two years. Having decided on investing in the RCT approach and the costs associated with that, the SSA-CP can only achieve its research objectives with an extended time frame and two years would be the minimum. Moreover, there are a range of emerging research questions discussed in the report that can only now start to be explored given the research infrastructure that is now in place.

The panel recommends an extension of the research phase of the SSA-CP for at least another two years but within the context of some key revisions to the research plan.

Introduction and acknowledgements

The Sub-Saharan Africa Challenge Program (SSA-CP) began its operations following approval by the CGIAR at AGM'04. The Program is managed by FARA (Forum for Agricultural Research in Africa). The SSA-CP went through an inception phase, and subsequently the CGIAR endorsed the findings of an External Review in 2006 including the key recommendation that the SSA-CP should continue for a three-year research phase. The research phase is coming to an end in 2010. The CGIAR's current interim Independent Science and Partnership Council commissioned a second External Review to assess progress and make recommendations regarding the future of the SSA-CP and implementation of the Integrated Agricultural Research for Development approach in light of results from the SSA-CP and the changes taking place in the CGIAR.

The Terms of Reference (TOR) of the Review Panel are given in Annex 1. Short biodata of the Panel members and consultants are given in Annex 2.

The Panel based its assessment on interaction with staff and partners of the SSA-CP primarily during its visits to FARA headquarters and all the Pilot Learning Sites, including visits to half of SSA-CP's Innovation Platforms (for Panel itinerary see Annex 3); and on the extensive documentation provided for the review (see Annex 4) and several other relevant documents cited in the report. In addition a survey was conducted among SSA-CP partners and stakeholders. Summary of the Innovation Platforms is given in Annex 5; and cases of two field sites are described in Annex 6. The site selection procedure is described in Annex 7. The panel engaged consultants to prepare separate reports; one on finances¹ and one of the experimental design used by the SSA-CP (Annex 8).

The review Panel wishes to thank all those at FARA headquarters and in the SSA-CP field locations who helped organise the review and the field visits and responded readily to the requirements and requests of the Panel. The Panel is grateful to the FARA Secretariat led by its Executive Director, Dr. Monty Jones. Special thanks go to the SSA-CP coordinator Adewale Adekunle and his staff for their excellent support. The Panel acknowledges with gratitude the numerous SSA-CP staff and partners at the Pilot Learning Sites for giving their valuable time to accommodate the Panel's tight schedule and interact with the Panel at the program sites. Especially the Panel would like to thank Robin Buruchara, Professor Alphonse Emechebe, Nelson Mango, Joseph Jojo Baidu-Forson and Paul Mapfumo for organizing the PLS visits. The Panel is grateful for the important contributions of Alain de Janvry and Elisabeth Sadoulet and Emmanuel Burnley, who prepared consultant reports for this review. The Panel thanks Sirkka Immonen at the ISPC Secretariat for her help in organizing the review and guidance through out the review process; the Fund Office for support on the governance and management component of the review, and staff at the ISPC Secretariat for logistical and administrative assistance.

1

http://www.sciencecouncil.cgiar.org/fileadmin/user_upload/sciencecouncil/External_Reviews/Report_Financial_Review_of_FARA_FINAL.pdf

1. Setting the Stage: The Panel's Perspective on SSA-CP Development and Design

1.1 Influences in the Development and Design of the SSA-CP

The Sub-Saharan African Challenge program (SSA-CP) has a formative history reflecting a number of sometimes competing ideas about the scope of research within the CGIAR and how research might lead to impact on development outcomes in an African context, issues that are currently central to the CGIAR reform process. The SSA-CP was one among several attempts by the CGIAR in the last decade to better organize and coordinate its multifarious activities on the continent. Moreover, its design and implementation occurred during a period of very rapid and significant change within both the CGIAR and African agricultural sectors.

The SSA-CP started with an initial concept note in 2001 and required over three years to develop, plan, and launch the program. The concept note went through several iterations, and its detailed design was based on a two-year consultative process with more than 100 representatives of African institutions and international experts. A program formulation workshop in March 2003 provided the basis for a comprehensive SSA-CP proposal to the CGIAR's Science Council (SC) in June 2004. It sought USD 70 million for an initial six-year investment in a new approach termed integrated agricultural research for development (IAR4D); and the SSA-CP was originally intended to run for a total of 15 years. The proposal was approved at AGM04 and the SSA-CP was launched in January 2005.

The years 2004-05 were the period when the Science Council developed the System Priorities for CGIAR Research 2005-2015². These defined the research program of the CGIAR and were intended as a mechanism to bring increased inter-center synergy as well as to raise the profile of the science carried out in the system. The system priorities were developed around the production of international public goods within a clearly specified set of global research priorities. Given the pressure on the CGIAR to demonstrate a coherent, intersecting, and strategic research agenda, the Science Council employed the three-year, revolving Medium-Term Plans as a mechanism to ensure that Centers' research programs were aligned with the system priorities. There was a particular focus on reducing Center projects that had a more development focus and therefore fell outside the frame of producing international public goods. Approval of the SSA-CP coincided with the Science Council's attempts to oversee research programs across the system and the SSA-CP was a rather atypical challenge program in regards to its regional focus, objectives, implementation modalities, and management structure. The interaction between the Science Council and the SSA-CP resulted in a series of design changes first in the proposal itself, second in the phasing of the program, and third in the overall research objectives and resultant research design. The changes evolved over the course of the implementation of the SSA-CP, which had significant implications for a program of this complexity.

The crux of the debate centered on the definition of research that would produce regional and international public goods, on the one hand, and on developing a research process that would produce impact under African smallholder conditions, on the other. This debate was also central to the research being carried out on natural resource management research within the CGIAR, where much of that research was carried out under quite specific, local contexts. Within NRM research IPGs were increasingly defined in terms of new methodologies, new knowledge, and information and decision support systems. This gave rise to integrated natural resource management (INRM) as a research process, integrating new methods, knowledge and tools through implementation in particular problem

² CGIAR Science Council. 2005. *System Priorities for CGIAR Research 2005–2015*. Science Council Secretariat: Rome, Italy.

contexts³. The INRM approach recognized that impact in smallholder African agriculture had to adopt a more integrated approach combining yield increasing technologies with sustainable management of the natural resource base. Implementation of these more integrated research approaches were considered to require more bottom up approaches, participatory action research, and effective partnerships. The problem for the SSA-CP was how to utilize the advances in methods, apply them with a focus on generating impact, but at the same time develop IPGs. The research focus became one of testing what was to be called the IAR4D model in the context of implementing it in three sub-regional, benchmark sites. These issues are captured in the Science Council commentary on the original proposal submitted by FARA (and are taken up in more detail in section 1.3) and is quoted in length:

There was considerable discussion (among Science Council members) about the nature and objectives of the CP, in particular, whether it was aimed more at development through dissemination and uptake of existing knowledge via new types of partnerships, or aimed more at knowledge creation and generation of IPGs. The SC felt strongly about the need for the latter and that the CP should focus on areas of CGIAR comparative advantage, including the generation of IPGs derived from research for sustainable poverty eradication. The SC understands that an effective partnership is a necessary precondition, to be followed by the scientific generation of outputs. It also acknowledges that the institutional learning from the formation of this partnership is a legitimate research activity of the CGIAR which can produce IPGs. (Science Council, Sept 2004)

At the same time as the Science Council was attempting to define a line between research undertaken by the CGIAR and development as undertaken by institutional partners, there was broader concern by CGIAR members about investments in Africa. There was a sense that CG Centers' research programs were often duplicative, lacked synergy, were not achieving expected impacts, were not aligned with NARS and SRO priorities, and were implemented without an overall CGIAR strategy for Africa. A CGIAR sub-Saharan Africa Task Force produced a report called The Tervuren Consensus which set in motion a set of activities oriented towards identifying areas of collective action among Centers and more productive institutional arrangements within an expanding array of national, sub-regional, and regional agricultural research organizations on the continent.⁴ Two collective action frameworks were developed, one for West and Central Africa and the other for East and Southern Africa, resulting in what were called medium-term plans. Both died a slow death as these issues were subsumed within the CG reform process and this left the SSA-CP as the only coordinated CGIAR activity across the continent.

Developing and approving the SSA-CP within a period of quite dynamic change within the CGIAR—although only a harbinger of what was to come with the current reform process—was equally matched by important changes within the continent itself. Firstly, the creation of the sub-regional organizations (SROs) during the 1990s was capped by the establishment in 2002 of the Forum for Agricultural Research in Africa (FARA) as a regional apex body. It immediately became involved in the development of the SSA-CP, as the 2003 design workshop was held in FARA's new headquarters, and was eventually asked to coordinate the SSA-CP. Secondly, the negative effect of the significant decline in both donor and government support to agriculture during the 1990's was becoming apparent, and a program such as the SSA-CP which focused on achieving impact had great appeal. Finally, structural adjustment and market liberalization programs had been implemented across the continent in the 1990s but private sector investment in African agricultural marketing systems was slow to respond. Policy shifted from more macroeconomic to microeconomic approaches and the facilitation of private-sector-led market development was an emerging area of research and donor focus at the beginning of the new

³ See in particular Science Council. 2003. *Towards Integrated Natural Resource Management: Evolution of NRM Research within the CGIAR*. Rome: CGIAR Science Council Secretariat.

⁴ CGIAR Secretariat. 2005. Report of the CGIAR sub-Saharan Africa Task Forces: The Tervuren Consensus, Washington, DC: CGIAR Secretariat.

millennium. A market orientation was increasingly at the center of the strategies of ASARECA and CORAF, but had not yet been integrated with INRM. The design meeting in 2003 brought these two emergent areas of research together within a framework which was termed integrated agricultural research for development (IAR4D) and which integrated productivity, natural resource management and markets. The program design in the original proposal maintained the bottom-up, action research mode of implementation of INRM and focused on the process and methodology required in implementing an integrated program rather than predetermining a research agenda. This would become a point of continuing debate between the SC and the Executive Council (ExCo) on the one hand and the SSA-CP on the other as the program evolved.

1.2 The Defining Characteristics of IAR4D and IPs

In the first three years of the SSA-CP, during what was called the inception phase, the methodological underpinnings of IAR4D were fleshed out in two strategy workshops in 2006. The strategic objectives of the SSA-CP were defined as:

- (1) Integrated value chains that enhance smallholder sustainable productivity and livelihoods;
- (2) Innovation platforms: arrangements for effective and efficient technology development, uptake and dissemination;
- (3) Methodologies and approaches for enhancing innovation systems and adaptive management of natural resource management;
- (4) Options for policy, legal and regulatory frameworks for increased agricultural productivity and commercialization; and
- (5) Strengthened stakeholder capabilities to effectively participate in IAR4D innovation systems for improved agricultural productivity and enhanced natural resource management.

It was during this period that IAR4D was merged and framed within agricultural innovation system theory. Innovation systems shift the focus from technologies per se to the utilization and application of new knowledge. There is an explicit focus on improving linkages between organizations within an innovation system in order to achieve impact. How to facilitate these organizational linkages around problem-solving innovations is the central implementation challenge within the innovation systems approach, and this is organized through innovation platforms (IPs). IPs became at that time the central implementation strategy for IAR4D within the SSA-CP.

The innovation systems perspective is reflected in a “white paper” published by FARA in 2009.⁵ The authors of the white paper state that they see IAR4D “as being about a broad set of processes that through their interaction lead to the generation and use of knowledge, with the following features:

- IAR4D is about change or innovation as an outcome, not just about information, knowledge or technology as a product;
- IAR4D places ‘research’ as one of the components contributing to the development process, rather than its pivotal point;
- IAR4D focuses on processes and performance rather than just products (technologies, policies); or, to put it another way, improved processes are the product.”

This description of IAR4D essentially characterizes IAR4D as a modality for implementing what has been termed knowledge to action programs.⁶ The problem for the SSA-CP was how to marry IAR4D

⁵ Hawkins et al. 2009. Integrated Agricultural Research for Development (IAR4D). A Concept Paper for the Forum for Agricultural Research in Africa (FARA) Sub-Saharan Africa Challenge Programme (SSA-CP). FARA, Accra, Ghana. 92 pp.

(and innovation systems) with a research program, which was the central objective of any challenge program. The panel agrees with the recent Stripe review of social science that “IS theory remains underdeveloped and exceedingly difficult to operationalize empirically (as a research construct).”⁷ Rather IS and by extension IAR4D is primarily an implementation tool. However, as argued later in this report, if IAR4D can be used as an implementation modality to facilitate “agrarian” change in agricultural communities, understanding how that change occurred can become a basis for developing a coherent research program. That said, any methodology such as IAR4D that can precipitate substantial change in farmers yields and income levels at significant scale in an African context is itself a potential subject for study. The development of a research focus for the SSA-CP is discussed in some detail in the next section.

In principle, the IAR4D concept itself would seem to be fairly simple:

- (1) Bring the stakeholders around the table in Innovation Platforms (IPs): farmers and their organizations, representatives of (national and international) research and extension, the private sector (input and output markets, food processing, transport, rural credit), local government (policy, subsidies, rural credit), NGOs and others.
- (2) Analyze the problems faced by farmers in improving their livelihoods, prioritize them and look for possible solutions.
- (3) Implement these solutions, monitor the implementation and deal with problems arising in the course of time and/or move to the next set of problems.

However, properly implementing this IP concept was not simple at all, in part because IPs and the IAR4D concept are inherently complex (see Box 1), and are expected to help achieve an interlinked set of ambitious outcomes.

Box 1: Defining Characteristics of Innovation Platforms

- (1) Fundamental to the IP is the objective of increasing farmer income through off-farm activities or through selling a surplus food crop produce or a cash crop grown for this purpose.
- (2) The productivity interventions organized by the IP involves a range of on-farm activities. Productivity of existing crops can be improved through crop intensification, using improved technologies such as fertilizer, improved seed and varieties, agronomic practices such as plant density, weeding, intercropping, crop rotation, use of organic matter. New crops, such as vegetables or tree crops can be introduced with the help of agricultural extension and/or the private sector.
- (3) The IPs take a systems approach, that is, they look at the entire agricultural production system, the relevant value-chains, their environment, and the interactions between them. As far as commodities, such as livestock, food crops or cash crops are concerned, the IPs take a value chain approach, that is, all aspects from the availability of rural credit and the purchasing of seed and other inputs, to land preparation, agronomic management, quality control to meet market standards, post-harvest technology, packing and transport, food processing and interactions with output markets. The value chain is placed in an infrastructural, institutional, socio-economic and policy environment.
- (4) A key role of the IP is to help the farmer get access to credit, improved seed, fertilizers and agro-

⁶ For a characterization of knowledge to action programs see Clark et al. 2010. Toward a general theory of boundary work: Insights from the CGIAR's natural resource management programs. CID Working Paper No. 199. Center for International Development, Harvard University. Cambridge, MA: Harvard University, July 2010.

⁷ Science Council. 2009. *Stripe Review of Social Sciences in the CGIAR*. Rome, Italy: Science Council Secretariat

chemicals, to post-harvest technology, transport and output markets, and to knowledge and training in agricultural technologies. Although the policy environment and the presence of government institutions are very important, the role of the (emerging) rural private sector is seen as pivotal in this connection. In particular in accessing improved seed, fertilizers and agrochemicals, and in identifying and accessing output markets.

(5) The IP, if successful, provides a win-win situation to the key stakeholders in the IP process: (a) the farmers are better off than before; (b) the input markets sell their improved seed, agricultural chemicals and fertilizers to more farmers; (c) the output markets get a more regular supply of better quality products; (d) the farmers actively seek the advice and technologies of the village- and district level staff of the Ministry of Agriculture (NARES) and the progress made reflects positive on the Ministry of Agriculture, and (e) the IARCs have access to a delivery mechanism for their technologies, variety-based (as carrier technologies) as well as NRM-based (as support technologies).

In chapters 2 and 3 of this report, the effectiveness of the IAR4D process will be assessed at the level of the IPs. This will be based on the relative balance of different actors represented on the IP, the potential for integration of productivity, NRM and markets, the ability to organize farmers, the effectiveness of knowledge transfer to farmers, and the ability to develop a bottom-up identification of farmer problems and solutions. Relative effectiveness across these dimensions will in turn have a potential range of outcomes, e.g., farmer adoption of new technologies, self-reliant and sustainable IPs, and an expanding array of potential growth linkages in the local, agricultural economy. It is these outcomes that form the real potential of IAR4D and as will be argued in this report, **the panel is of the view that the SSA-CP is still too early in the IAR4D process to assess these outcomes.**

The original objectives and anticipated benefits of the SSA-CP were similarly “simple” in principle, but required complex implementation modalities (see Box 2 below). These objectives were superseded during further design of the SSA-CP; and are noted here only to provide a context for what followed.

Box 2: SSA-CP’s Original Objectives, Approach, Mechanisms, and Expected Benefits

Objectives: The SSA-CP aimed to: (i) develop technologies for sustainably intensifying subsistence oriented farming systems; (ii) develop smallholder production systems that are compatible with sound natural resource management; (iii) improve the accessibility and efficiency of markets for smallholder and pastoral products; and (iv) catalyze the formulation and adoption of policies that would encourage innovation to improve the livelihoods of smallholders and pastoralists.

Approach: The three initial PLSs (one site per subregion) were selected by SRO Task Forces established by the African Sub-Regional Organizations (SROs) for agricultural research (CORAF/WE CARD, ASARECA, and SADC/FANR). The three sites were Kano-Katsina-Maradi (Niger and Nigeria), “Lake Kivu” (Democratic Republic of Congo, Rwanda and Uganda), and a transect that runs from northeast Zimbabwe through central Mozambique into southern Malawi. For each site, Pilot Learning Teams (PLTs) were to be formed. These teams would be comprised of members from a variety of scientific disciplines (biophysical and social) and from diverse institutions (e.g., national agricultural research institutes, universities, CGIAR Centers and advanced research institutes; extension agencies; nongovernmental, community-based and farmers’ organizations; and the private sector).

Upon receipt of funding, the three initial PLTs were expected to continue the participatory problem

identification with farmers to further refine the problems to be addressed, and to identify the relevant “entry points” for research which would set the agenda for the work of the PLTs. Regardless of the primary focus of PLT activities, all projects were expected to include measures to address the four overall interacting SSA-CP objectives, i.e., intensification, NRM, policies, and markets. PLT interventions would be driven by local needs, but would draw on a significant amount of available knowledge and best-bet technologies.

Mechanisms: To foster internalization of a “new way of doing business” and the out-scaling of program outcomes to neighboring villages or similar agro-ecosystems elsewhere on the continent and the up-scaling to connect with local, national and international institutions, governments and the private sector, the SSA-CP envisaged the following four mechanisms or “support pillars”: (i) promotion of organizational and institutional change to enable cross-disciplinary research and development and multi-institutional collaboration; (ii) capacity building for project teams, farmers, and scientists in African institutions; (iii) information and knowledge management (including documentation of new methodologies developed) to disseminate widely the findings of IAR4D work; and (iv) ongoing monitoring and evaluation, and a systemic approach to impact assessment, to track Program progress toward overall goals, signal the need for mid-course adjustments, and document the returns on investment in IAR4D.

Expected Benefits: Given the magnitude of the constraints to agricultural development, the innovative nature of IAR4D, and the complexity of change dynamics, it was expected that it would take “at least 5-10 years to demonstrate the full impact” of this new approach. However, “signs of tangible benefits” from the work of the PLTs were expected within 1-2 years. An early evaluation of the Phase I work would therefore be undertaken to demonstrate the validity and challenges to implementing IAR4D in the initial three sites. Based on evaluation findings, the CGIAR Executive Committee was expected to determine if the evidence warranted expanding IAR4D to a larger number of sites.

The revised program objectives and the resulting “Research Plan”—as well as the panel’s observations and assessments on the process by which these were finalized—are discussed at length below. These provide the panel’s perspective on the context within which the SSA-CP was designed and implemented. They also help set the stage for our assessment of the SSA-CP’s research agenda, plan, and its implementation (in chapter 2).

1.3 Defining a Research Agenda for the SSA-CP

At the heart of the development and implementation of the SSA-CP over its first three years was the question of what constitutes a viable research plan. There were three strands which created this difficulty, namely (1) the intent by the new Science Council to raise the level of science in the CG system, (2) the lack of clarity on research methods within innovation systems approaches, and (3) how to organize research around the testing of new methodologies such as IAR4D. At the beginning of this decade the concept of mobilizing the new science to impact on development problems within the Science Council’s development of the System Priorities (Science Council, 2005) was counterbalanced by the seeming intractability of achieving sustained agricultural growth in sub-Saharan Africa, driven in part by the deteriorating natural resource base across the continent and in part by the infrastructural and policy constraints on market development. The dilemma was starkly characterized by the World

Bank's evaluation of the CGIAR system⁸ as follows: "The (CGIAR) System is being pulled in two opposite directions. On the one hand, the CGIAR Centers are not conducting sufficiently coordinated research on the highly decentralized nature of NRM research, which calls for effective partnerships with NARS to produce regional and national public goods in NRM. On the other hand, the System is not sufficiently centralized to deal with advances in the biological sciences and IPRs, which call for a more unified approach to research strategies and policies." The development of the System Priorities for the CGIAR (Science Council, 2005) and the approval of the first two Challenge Programs focused to a significant degree on the second direction in attempting to achieve both greater focus and enhanced integration of CGIAR research, as expressed in the system priorities document:

The vision for the longer term is one in which the CGIAR is a provider of international public goods through agricultural research aimed at the alleviation of poverty. The CGIAR aims to progressively devolve some current research [particularly aspects of breeding for germplasm enhancement and site-specific natural resource management (NRM)] to national agricultural research systems (NARS) with increasing capacity. Devolution and enhanced delivery to the poor in different localities will be effected through a range of partners. The CGIAR will move towards the solution of the complex system issues undermining moves out of poverty and the success of agriculture in developing countries, supported by genomics research and provision of science-based policy advice. It is clear that the staging of such a strategy will be different in regions where NARS have different strengths. Special attention will be paid to the building of partner capacity in sub-Saharan Africa (SSA).

How to implement research in an African context that "moved towards the solution of the complex system issues undermining moves out of poverty" was a central issue in the evolving interaction between the Science Council and the SSA-CP. The other issue was institutional partnerships which were seen as a necessary first stage in implementing IAR4D. This was best expressed in an initial review (Science Council, October 2004) of the implementation of the first three challenge programs, as follows:

In the proposed Sub-Saharan Africa CP, a major bottleneck to the challenge is indeed the development of effective partnership to define the research agenda to overcome the constraints to development. In this case, the CP itself must provide a time-bound outcome of developing an effective institutional partnership as a prerequisite for subsequent activities with agricultural research objectives. In the process, the CP needs, through research on institutional learning, to provide an International Public Good on effective partnership development.⁹

Development of institutional capacity and partnerships within an inception phase was the basis for the conditional approval of the SSA-CP proposal in 2004. In the Science Council's review and recommendation it noted that "at this stage in the evolution of the SSA-CP, the SC does not believe sufficient information is available within the proposal, in terms of the specific research plans and science to be applied, for the SC to make a judgement on the relevance and quality of the science," but that "a major constraint for this CP, in terms of identifying specific research objectives and science to be applied, is the lack of institutional arrangements that the CP proponents see as a prerequisite for

⁸ The World Bank 2004. Addressing the Challenges of Globalization. An Independent Evaluation of the World Bank's Approach to Global Programs. The World Bank, Washington D.C.

⁹ Science Council. Oct 2004. Synthesis of Lessons Learned from Initial Implementation of the CGIAR Pilot Challenge Programs. Rome, Italy: Science Council Secretariat.

further planning and implementation.” The Science Council then recommended to ExCo that, “at this stage, support be provided to the CP for activities to develop the appropriate institutional arrangements and subsequently undertake the diagnostic phase for the research (Phase I) only.” At AGM04 the CGIAR “approved in principle the implementation of the SSA-CP for a five-year period subject to a successful assessment of its 18-month inception phase” and the program began in January 2005. However, the question of whether the SSA-CP had a sufficiently well developed research plan still remained.

The coherence of the SSA-CP research plan was central to the interaction between the SC and the SSA-CP over the 2008-2010 MTP and there were fundamental differences in viewpoint. The source of that tension has been well characterized by Clark, et al. (2010) in terms of what they call “boundary work”. “‘Boundary work’ signifies the processes through which the “research community organizes its relations with the worlds of action and policy making, on the one hand, and with practice-based and other forms of knowledge on the other. Originally developed to help understand efforts to demarcate “science” from “non-science”, the idea of boundary work has since been applied to the interface between science and policy and, more broadly, to the activities of organizations that seek to mediate between knowledge and action. The central idea of boundary work is that tensions arise at the interface between actors with different views of what constitutes reliable or useful knowledge, and that those tensions must be managed effectively if the potential benefits of research-based knowledge are to be realized by society.” (Clark et al. 2010). The SSA-CP represented a typical knowledge to action program where boundary work was central to the objectives of the program. These types of programs are likely to become more common under the current CGIAR reform. The question was how much of that work could be framed within existing research paradigms.

The external review of the SSA-CP in 2006 recommended that “the CP focus on the research question—does the IAR4D concept work and can it generate deliverable IPGs/RPGs for the end users?” That is, the research program should focus on proof of concept that IAR4D actually delivers the impacts it professes. However, the SC went on to add two further research questions. “The SC agrees with the Panel recommended focus and adds a further clarification to the main research question: Does the IAR4D framework deliver more benefits to the end user than conventional approaches (had the conventional R&D and extension approach had access to the same resources)? And, how sustainable and usable is the approach outside the test environment (i.e. issues of scaling out for broader impact)?” The SC then went on to put a time bound on this research phase. “The SC has recommended that the research phase ends by December 2009 with an answer (yes or no) to the question: does the new IAR4D concept improve delivery and have an impact? If the outcome to this challenge is positive, others more directly involved in development could scale out the results.”

The answer that the SSA-CP provided in the 2008-10 MTP was essentially as follows:

Demonstrating proof of the IAR4D concept must begin with effective execution of IAR4D in the field, as has been planned from the outset of the Challenge Programme. Put slightly differently, the SSA-CP’s original plan for carrying out IAR4D in the Pilot Learning Sites, and documenting processes and explaining how they influence livelihood impact, remains the centerpiece of the approach to answering Question 1 above. Questions 2 and 3, in effect, expand the objectives of the Challenge Programme to include a comparative evaluation component and a process that evaluates the replicability, efficiency and effectiveness of IAR4D as it moves from a pilot scale to wider implementation. To respond to these latter two points, the CP will develop lessons and generalisable principles for conducting IAR4D based on the PLSs experiences of

implementing IAR4D, as well as documenting the overall efficacy and impact of the approach.

The SSA-CP's evaluation of IAR4D was cast in an adaptive management framework, that is implement, continuously assess, and adapt the model as the program learns how it best functions across the different environments—a valid approach in the field of evaluation. By focusing on monitoring of central processes there is increased understanding of the how question, namely the mechanisms by which impact on principal outcomes is achieved. The panel's view is that there is validity to this approach for the question of evaluating the effectiveness of a new model or methodology. However, it is not appropriate for evaluating the second question comparing IAR4D to conventional systems, as a comparative framework is needed. The basis for addressing the third question was based on deriving general principles within what is often termed a community of practice, that is as the new methodology is used more widely and in increasingly different contexts. A good example of the use of this approach—and the contrast with more rigorous evaluation approaches—is that of farmer field schools. The increasing evidence from the expanding use of the FFS approach was that it was effective in improving farmer knowledge and adoption. The methodology was systematically improved and applied to different areas through this adaptive management framework, but it could not answer the question of how much more cost effective the FFS approach was compared to traditional methods. Answers to the latter question would then feed back into investment decisions.

Between FARA's submission of the 2008-10 MTP and the SC evaluation together with FARA response, the substance of the debate over the research plan shifted 180 degrees. In its comments FARA committed the SSA-CP to a rigorous experimental approach involving randomized control trials (RCT) "with advice from the SC" and at the same time the SC appeared to hedge its bets. This shift is important because it fundamentally changed the structure of the SSA-CP and it committed the SSA-CP to a research plan that had not been applied in African agriculture before or within the CGIAR at the scale that was proposed.¹⁰ The panel is of the view that to provide proof of concept within an RCT framework would have had significant budgetary implications which were not clearly thought through at the time and in the end curtailed the design that could be implemented within the SSA-CP's budget. The SC's commentary is worth reporting in full:

The SC considers that the CP has not yet fulfilled the key requirement put forward by the SC in its previous commentary: *"The SC believes that in defining research hypotheses it is imperative to develop a research design that can allow the research program to identify the effects of the different components of the IAR4D approach and do so in a scientifically, statistically-based manner"*. The CP has not described yet a program that is feasible and that will clearly add value to CGIAR research, an issue raised in the external review. In fact, in their response to the SC recommendation and in the MTP, the SSA-CP researchers admit that after they *"consulted with a number of outside experts in the field of development economics and other social sciences, who are at the forefront of innovations in evaluation methodologies and research design ..."* the conclusion was that a *"truly scientifically rigorous evaluation approach would require a level of measurement effort that is not feasible or justifiable under the budgets available to the SSA-CP"*. The CP should suggest at a minimum some appropriate verifiable indicators of "success" at the pilot sites that might at least allow some comparisons of what they were from baselines prior to the interventions in the CP, to what they are afterwards; even if it is not feasible to establish statistically rigorous "with-and-without" and "before-and-after" counterfactual frameworks.

¹⁰ HarvestPlus also carried out over much the same period an evaluation of nutritional outcomes from a food-based sweetpotato intervention which was based on an RCT design but implemented in only two countries.

The panel is of the view that the recommendations in this paragraph are somewhat contradictory, that is statistical validity on the one hand and reliance just on verifiable indicators on the other. The point in highlighting this issue is the steps in the decision making process that went into moving research into a very new area for the CGIAR with significant cost considerations and the role of the oversight function, particularly as the CG system itself moves into an era of greater accountability for its research plans and outcomes. The panel is further of the view that the SC may have been too hasty in recommending the three research questions that should guide the proof of concept, without thinking through itself how those would be effectively tested, and that FARA in taking up the challenge did not fully think through the cost implications inherent of applying an RCT to answering those three questions. On the other hand, the inception period had already been extended for a year and FARA was under some pressure to have an approved research plan in order to begin to implement its program.¹¹ The 2009-2011 MTP was based completely on the RCT design and the SC fully endorsed the research design within the plan.

The SSA-CP's revised (current) objectives and expected outputs and outcomes are highlighted in Box 3. These provide the basis for the panel's assessments of the SSA-CP in subsequent chapters of this report.

Box 3: The SSA-CP's Revised (Current) Objectives, Outputs and Outcomes

Objectives: The revised objectives of the SSA-CP were now stated as "research questions." These, as per the program's "research plan" were:

- (i) Does the IAR4D concept work and can it generate IPGs and regional public goods (RPGs) to end users;
- (ii) Does the IAR4D framework deliver more benefits to end users than conventional approaches (assuming conventional research, development and extension approaches have access to the same resources); and
- (iii) How sustainable and usable is the IAR4D approach outside its test environment, that is, concerning its scaling out for broader impact.

Outputs: The revised expected principal outputs and IPGs of the SSA-CP were accordingly modified as well. They were now: (i) innovation platforms for use across a wide range of conditions in Africa; (ii) technological, institutional and policy options targeted on the interface of processes driving productivity gains, efficient use of resources, the care of the environment, and policies and markets; (iii) an evaluation of whether IAR4D works and the benefits it delivers compared to those delivered by traditional approaches; (iv) a database of process and impact indicator variables for 36 innovation platforms and their associated research communities and households; and (v) methods and tools for designing, implementing and analyzing social experiments in Sub-Saharan Africa.

Outcomes: The revised expected outcomes were: (i) increased diffusion and adoption of IAR4D by research and development organizations; (ii) increased awareness of the impact pathway for IAR4D; (iii) increased investment towards supporting IAR4D processes; (iv) increased human and institutional capacity for innovation among ARD actors; and (v) increased adoption of sustainable productivity and profitability enhancing innovations.

¹¹ The final research plan can be found in: FARA (Forum for Agricultural Research in Africa). 2009. *Sub-Saharan Africa Challenge Programme: Research Plan and Programme for Impact Assessment*. Accra, Ghana.

2. Assessment of the SSA-CP Research Plan and Its Implementation

2.1 The Revised Research Plan

The SSA-CP was in a number of respects “business unusual” for the CGIAR but especially so in terms of how the research agenda was defined. The SSA-CP did not focus on the core CGIAR business of developing improved production or NRM technologies. Rather the assumption was that these either already existed after some 50 years of research by the CG on the continent or were being developed in other research programs.¹² In this regard, the panel agrees with the following part of the SC’s assessment of the 2008-10 MTP: “Most of the proposed work is toward the development end of the spectrum. An important part of the program involves the creation of an “innovation platform” that is supposed to solicit ideas and thereby provide empowerment for people to solve their own problems. For these parts, the CP is clearly not oriented towards research but describes a way to use mostly existing resources and technologies for development.” However, the point is that the larger ambition of the SSA-CP was on understanding impact pathways, especially in terms of how to integrate productivity, NRM, and market objectives, and on understanding the generation of development outcomes, using IAR4D as an implementation framework. This is a very different type of research agenda and one that will become increasingly central within many of the CGIAR Research Programs (CRPs). The panel’s view is that the research agenda was not fully developed—and certainly not as described in its MTPs-- but rather was eventually set aside in order to provide proof of concept.

Was the “proof of concept” of IAR4D an appropriate research agenda for the SSA-CP in relation to other alternatives? Organizational models for agricultural R&D have almost universally been imported from outside Sub-Saharan Africa, and in the post-colonial period such importation has generally come tied to development aid. The most salient example of the latter was the World Bank’s funding of Training and Visit extension during the 1990’s. If IAR4D was to be scaled up through systemic change in the R&D structure, as for example through a World Bank loan, then there was a very strong rationale for developing a rigorous test of the effectiveness of IAR4D, especially under the challenging institutional, market, and agroclimatic conditions of the continent. However, if IAR4D was to be scaled up through an expanding network of piloting and experimentation, as has been the case with FFS or farmer participatory research, then proof of concept would not have been needed. However, as suggested in Chapter 3, there is some move toward more systemic pathways for scaling up IAR4D, and in such cases a proof of concept is obviously needed. The succeeding questions then are whether an RCT is an appropriate method to provide such proof of concept and whether the design of the SSA-CP’s RCT is sufficiently robust to provide such an answer.

The panel’s view is that there is much to learn from the SSA-CP’s application of an experimental design to the evaluation of the relative effectiveness of IAR4D. This is a relatively new area for the CGIAR and at the same time there is quite furious debate within the development community about the practicality of using this evaluation “gold standard”. The SSA-CP well understood the research design issues, as were explored in Annex 3 in the 2008-10 MTP. This section will provide only the beginnings of such an assessment and it is ably supported by a review of the SSA-CP’s research plan by Alain de Janvry and Elizabeth Soudolet (see Annex 2).

¹² A CGIAR project involving IITA, CIAT-TSBE, and Bioversity started about the same time as SSA-CP and was implemented in the Lake Kivu area, with substantial overlap with the Lake Kivu PLS. This Consortium for Improving Agriculture-Based Livelihoods in Central Africa (CIALCA) focused much more on producing improved production technologies. Optimally CIALCA which did the production research could have been integrated with Lake Kivu PLS which did the research on development outcomes. There is an interesting question of how two such complementary programs could have been more tightly coupled. Moreover, it might be noted that the implementation of CRP1 is based on the assumption of existing component technologies.

The SSA-CP's research design was based on the three questions posed by the Science Council in its commentary on the external review of 2006. Were these the right questions? The first question on the effectiveness of IAR4D is a central question, but quite independent of whether IAR4D produces IPGs. The RCT is well designed to answer this question, although there are probably less expensive alternatives. The second question comparing IAR4D to traditional linear approaches was in many respects a central question and could only be done within an RCT approach. However, there are a range of complexities to this question that make the RCT approach particularly difficult and expensive, and in turn raise the succeeding question of whether the cost would justify the value of the information obtained. Finally, the third question of whether these results can be scaled out is not possible to answer within an RCT design. Additional methods and information are needed—see the commentary by de Janvry and Saudolet.

All the issues inherent in applying an RCT design are brought out in comparing IAR4D to conventional “linear” methods in the second research question.

First there is the issue of what is being compared. Are IPs compared to traditional extension methods, such as T&V? But, that does not provide an appropriate evaluation of the extent to which research links to extension, even if in a “linear” mode. If linear systems were to be assessed, what would be the unit of analysis, comparable to IPs in the case of IAR4D? The SSA-CP never effectively assessed this question, relying instead on what was currently being practiced in the PLS target areas without developing a method to assess conventional approaches. This was primarily due to lack of sufficient budgets to monitor conventional sites, much less define what a conventional treatment unit might encompass.

Second was the difficulty of defining and sampling a counterfactual conventional site without selection bias. This is the focus of the evaluation by de Janvry and Saudolet. The basis of the difference between SSA-CP design and the critique by de Janvry and Saudolet is primarily the biases inherent in comparing randomly sampled IAR4D sites with existing conventional sites. There is also a major issue of what is the treatment unit and therefore what is a sufficient sample size. **The panel notes that a fully randomized RCT comparing conventional extension and IAR4D would probably have doubled the budgetary requirements and at the same time, given that the treatment units were defined at a district level, would have required significantly increasing the size of the benchmark sites, which in itself would have substantially increased logistical costs in implementing the design. The panel's view is that comparing two R&D systems within a RCT design would have been far too expensive to justify the costs, even if the conventional system could be appropriately specified.** De Janvry and Saudolet argue that a paired site methodology would be an appropriate second best approach but the panel does not have enough information to evaluate the cost effectiveness of that approach for the research question being addressed.

The complexity of overlaying an RCT design on an ongoing program should not be underestimated. Virtually by necessity compromises have to be made between maintaining the validity of the research design and maintaining the integrity of the knowledge to action program activities. These compromises also have to be made within the context of competition for budgetary resources, as RCTs require a significant amount of resources when done at the scale of the SSA-CP. Moreover, to test the question of whether IAR4D produced significantly different outcomes from conventional linear approaches requires clear differences in terms of implementation modalities. This is difficult to achieve when the same program has to implement both models, as it confuses program alignment, particularly when IAR4D has to work with some of the same institutions involved in the “linear” model. Finally, the RCT design requires a certain pre-specification and standardization of what constitutes the

implementation of IAR4D. This puts various constraints on the implementation of the IAR4D model, primarily in terms of not being able to experiment beyond what constitutes a treatment. This limits the adaptive learning that should be incorporated in the development and implementation of a new institutional methodology.

The panel has argued that the RCT approach was a valid research option for such an untested model as IAR4D, particularly if that model was to be applied at the level of the R&D system. However, such an approach comes with trade-offs in terms of other research options that could be pursued. Moreover, the SSA-CP was not implementing a well worked out methodology. On the contrary, implementation modalities were worked out as the project proceeded, with little potential for the assessment of alternative implementation options—given the fixed nature of the RCT design. A particularly strong argument could be made that the first phase could have worked through such options, followed by a more coherent definition of IAR4D, implementation modalities, and fundamental differences with conventional systems. This would then have provided the basis for a more effective RCT design. However, it is doubtful that such an orderly phasing could have been argued for or the issues foreseen in the discussions on the SSA-CP research plan. It could as well be argued that the relative effectiveness of IAR4D would have been an emergent property of the implementation of the SSA-CP—which is more or less the basis for this panel’s positive assessment of IAR4D—and therefore there is a question of the value of the additional information an RCT would contribute.

2.2 Program Progress and Current Status

The decision to focus the SSA-CP around the proof of concept provided an organizational momentum for the program after a significant period of uncertainty which had put much of the program on hold. In the three year research phase from 2007-2010 (=4 years? 2008-2010?) the program has developed credible implementation modalities for IAR4D, has established 36 innovation platforms across a broad spectrum of agricultural systems in sub-Saharan Africa, has implemented a complex experimental design to test proof of concept, and has put in place the baseline survey, M&E methodology, and an analytical support team to implement the RCT. To a real extent the SSA-CP has established a social and economic research “laboratory” to test development outcomes under the range of constraints facing smallholder agriculture from southern Niger to eastern Congo to northern Mozambique. **On the basis of meeting with over half of the IPs, the review panel notes that the IPs have to varying degrees achieved a functional partnership across quite different organizational actors, a bottom-up approach to problem diagnosis and testing of potential solutions, real ownership by farmers and other actors of the IP, and a framework for integrating innovations in productivity, markets, and NRM. These would be intermediate indications that the IAR4D concept is functional within the sub-Saharan Africa context and moreover, a research design is in place to provide a rigorous test of whether IAR4D does produce impact.** These issues are explored in more detail below, and in chapter 4.

2.3 A Qualitative Assessment of the IAR4D Process

The panel can provide only a qualitative assessment of the IAR4D process, as the review is based on one meeting with about half of the IPs. What was clear to the panel was the enthusiasm for the IAR4D approach across all the actors and their feeling that the approach was in fact different from what had been tried before. There was a particular feeling at the task force level that institutional boundaries had been breached and equal partnerships had been established, often for the first time. However, what was also clear from this brief review was that there were significant differences across the nine task forces in how IAR4D was implemented. This variation is in fact quite useful, in that it provides a test of the robustness of IAR4D methodology, on the one hand, and a basis for improving the effectiveness of

the approach, on the other hand. The panel visited two of the four IPs for each of the TF's and as well had an independent interview with each of the TF's. This provided the basis for the assessment that follows.

The task forces in many ways served as a higher level platform connecting different institutions and the private sector, but not involving farmers. With the West and southern Africa PLSs, these task forces operated virtually independently and with no common members. In all cases the organization of the task forces in these two PLSs derived from the original competitive grants that were selected. In southern Africa the mandate of the IARC tended to define the initial entry point at the IP level, and to a significant extent this also characterized West Africa. **The panel's assessment is that the Lake Kivu PLS provided a more effective institutional platform in that it attempted to combine the relevant areas of specialization needed within the IAR4D process and at the same time there were no preconceived entry points at the IP level.** This structure, however, required a higher level of coordination in order to define and integrate responsibilities across countries, IPs and functional areas of expertise.

Given the intent of challenge programs to achieve synergies across Centers, integration of TFs at the PLS level as in Lake Kivu generates a greater deal of interaction between different Centers, as well as national programs. This coordination and integration of activities could be seen as something of a trial run for the CRP's, particularly as Lake Kivu is organized around a benchmark site. This in turn allowed the development of a more coherent problem analysis at the benchmark site level, rather than a division into specific individual components. Also, Center collaboration was much more effectively achieved within the SSA-CP in the area of social science, while collaboration in the areas of productivity and NRM were much more limited, relying rather on the work generated within individual Centers. The selection of the initial TF's based on competitive grants acted as a barrier to stronger collaboration in the productivity and NRM areas, while the agreement on the RCT design as the common research protocol across the three PLSs acted as a driver toward greater collaboration, but almost wholly in the area of social science.

a. Structuring the IPs as the Basis for Sustainability: A brief overview of approaches to the development of the IPs across the PLSs is presented in Table 2.3.1. The internal structure of the IP, especially in relation to the functions that the IP establishes for itself and its members, is a principal factor in determining the sustainability of the IP and its relative effectiveness. The Lake Kivu PLS developed a much more comprehensive approach to IP development and internal structuring. In comparison to the other two PLSs, the IPs were developed outside existing institutional structures, whether they were local government or rural development agencies. Moreover, farmer group formation among its members was organized internally, rather than being built on existing farmer organizations. In turn, the chairman and committee members were elected by the membership, as compared to the chairman of the LGA assuming chairmanship of the IP and farmer leaders of existing farmer associations serving on the IP. This was reflected in the quality of the leadership and the organization of the meetings. In Lake Kivu the IP organized the meeting, the chairman made a presentation of the IP, and a wide range of members participated. In most of the IPs in KKM, the chairman often could not attend due to other commitments, there was no presentation on IP organization and activities, and participants were primarily either farmer representatives or institutional agents. However, it must be emphasized that this is an assessment of relative effectiveness, as the IPs in KKM had achieved the development of a platform for institutional and farmer linkages, but the level of dynamism was visibly different.

Table 2.1: Dimensions in the Organizational Structure of IPs Across PLSs

	Lake Kivu PLS	KKM PLS	ZMM PLS
Committee Structure	Extensive	Limited	Limited
Constitution	Yes	Yes	Yes
Chairman Selection	Elected	Appointed	Elected
Farmer Group Formation	Internal within IP	External to IP	External to IP
Integration into LGA Structures	Independent	Integrated	Independent

In all the PLSs the IPs had developed a constitution which governed their operation. Most were deciding whether they should become a legal entity and under what national authority. The Lake Kivu IPs also had developed a quite sophisticated committee structure, usually consisting of executive, research advisory, finance and audit, market, and M&E committees, although these will vary depending on the core problems being addressed by the IP. There are also committees organized at village or parish level. The committee structure and the initial action plan are then made explicit in the development of an IP business plan. In Lake Kivu the latter is motivated by a principal focus on market development, which was not seen as such a constraint in KKM. However, the business plan helps to prioritize activities and organize the work of the committees. This sets up an internal dynamic in which all the different committees must be seen to be meeting their commitments. There were a few voices in KKM that suggested that output markets were an issue to be addressed within the IPs. There was discussion of how the warrantage system might be developed within some of the IPs, but such development requires more time than just two years and it as well requires collective action at the level of the IP, in terms of either collective investment in storage facilities or the identification of a entrepreneur that is willing to take on the challenge—private sector investment in grain storage is an area of visible underinvestment in SSA. Nevertheless, in Lake Kivu the IPs were very clear that there was an emerging role for collectively organizing such investments, often by local private entrepreneurs such as the potato grading, packaging, and marketing operation in Gataranga IP in Rwanda. However, this would require establishment as a legal entity.

There are across the PLSs different avenues to achieving sustainability of the IPs. KKM is moving toward integrating the IP better into local government structures.¹³ This requires a phasing of roles from research institutes leading the IP process to ownership by IP members, but particularly local government. The panel views this as a route to sustainability, but with some trade-offs in terms of farmer ownership of the IP. Moreover, this route sets in motion a more institutional approach to expanding the membership of the IP. As Ellis-Jones (2009) notes LGAs were responsible for including another 21 villages in existing IPs in the Sudan Savanna TF. A successful IAR4D program cannot be limited to only a few villages in a constituency where leaders are democratically elected. In Lake Kivu, on the other hand, sustainability is based on developing effective management structures, a sense of self-reliance, and generating internal financial sources, based on both membership fees and an IP overhead from marketing initiatives. In turn, expansion of farmer groups is based on perceived benefits from joining the IP. This is a much more organic growth process based on the performance of the IP.

b. Processes Facilitating IAR4D: IAR4D is process based, with the institutional innovations of IAR4D arising out of a phased application of those processes. As may be expected from the analysis above,

¹³ For a useful discussion of the IP development process in KKM see Jim Ellis-Jones, Kano-Katsina-Maradi Pilot Learning Site: Sudan Savanna Agro-Ecological Zone: Innovation Platform Creation. Unpublished report. December 2009.

Lake Kivu has a much deeper and well developed set of processes in place to facilitate the development of the IPs. As stated previously, much of this builds on CIAT's former Enabling Rural Innovation program, and therefore Lake Kivu had something of a head start in working with partnership arrangements, participatory market evaluation, farmer organization, and participatory M&E, all elements developed within that program and which was relatively unique across the Centers participating directly in the SSA-CP. Moreover, Lake Kivu had Makerere University as one of its core TF members. Besides providing a broad pool of expertise in a range of areas, the university developed very innovative communication strategies within its Open and Distance Learning Network¹⁴, could draw on students to fill capacity gaps, drew on the technology incubation center in the Department of Food Science, and evolved the IP as a vehicle for the Faculty's outreach work. A university such as Makerere adds an important set of capabilities to the PLS, which was not present in the other two PLSs.

Important processes, but by no means exclusive to these, are the following: (1) joint understanding by all partners of the principles and practices involved in IAR4D, usually done through a set of facilitated courses and discussion groups, (2) an iterative process of problem identification and development of an action plan, (3) capacities to enhance farmer organization as vehicles for communication flow, adaptive research and extension, and market aggregation and quality control, (4) organizing farmer training, information dissemination, and enhanced learning by doing, (4) developing modalities for participatory M&E that feeds into decision making at the IP level, (5) capacity strengthening in identified gaps within the IP, and (6) developing effective communication strategies at all levels of the IP. To reiterate a central point, such processes are best developed and iteratively enhanced if done at the PLS level, as opposed to developing them independently at the TF level. Over time this review and consolidation of methods would have moved to the level of the SSA-CP itself, but this was not possible given the time frame for IP implementation. However, what is available is a variety of different methods and experiences, which would take some time to assess and effectively codify.

Lake Kivu is apparently alone in having a well developed IAR4D course. The values presented in this course were very well articulated by farmers and other IP members at the meetings with the review panel. IP members in Eastern Congo were very uncertain initially about whether improved knowledge just by itself could lead to self-reliance and economic change, nor that self-determination could be a project in itself. Other projects just brought gifts, while IAR4D would be based on very different values but to realize these required commitment and working together. The farmers now understood how those goals could be reached. To undertake such a course at the beginning of the IP process would have required buy in from other TF members in the other two PLSs, which implied a level of independence of the IP from participating institutions. This would have been difficult given that the IP relied on these institutional structures.

The process of problem identification and the development of an action plan is fundamental to the bottom up determination of technological, market and management interventions. There are existing methods that can be used in this process and the Guinea Savanna TF in KKM used the Participatory Learning and Action Research methodology to good effect. Within the SSA-CP, research institutes led this process and its effectiveness depended on matching problems to potential solutions or to opening up new possibilities not considered by the problem identification process. At this point productivity, markets, and NRM were potentially integrated and problem diagnosis was matched to options "on the shelf". Market solutions in turn depended on effective participation of the private sector within the IP. The scope of the options that could be considered was very much a function of the make up of the IP and TF's. In KKM and ZMM the scope was very much framed by the previous grant proposals and the

¹⁴ See Moses Tenywa, et al, Using ICT to improve the quality of life in South Western Uganda through fast and timely delivery of agricultural information. Unpublished report. Undated.

ongoing research interests of the participating Centers. In Lake Kivu the problem scope and in turn the scope of solutions was much broader and much more open. This allowed for a much more effective integration of the three areas. Moreover, CIAT and Makerere University had done previous work on linking farmers to markets which helped to structure the problem identification process.¹⁵ At the same time, ZMM had developed much more refined diagnostics and solution options in the area of NRM. Given more time, it would be expected that these methods in all three sites would have converged.

The action plan in turn almost universally resulted in a series of adaptive research trials with farmers in the first season. These were particularly prominent in KKM and ZMM, with Lake Kivu tending to focus more on farmer training in improved crop management, although often accompanied by intensive monitoring of plots by farmers where improved techniques were used. However, the adaptive phase was carried out only for one season. There was some ambiguity in the objective of the adaptive research, that is whether a rigorous test of technology options, a method for farmer learning and understanding of principles—for example nutrient balance—, or primarily as demonstration of technology options. Given the constrained time frame, there was obvious pressure to combine these, if not shift the focus to selecting and demonstrating best bet options. However, trials comparing TSP and DAP as a P source are of limited value to farmer learning unless s/he also understands the role of N provided by the DAP. The problem extended to the comparison of more complex technologies such as contour farming based solely on yield, when a range of other criteria (e.g. labor and cost considerations) would also enter into the ranking. Furthermore, the results from these trials were sometimes used to show the potential gains at farm level of the IAR4D approach, when the technologies had little to do with the SSA-CP and the trials had no rigorous statistical design which would have allowed for comparisons between farmers' practices and improved technologies. Adaptive research has an important role to play in IAR4D, but its objectives need to be clearly defined and a more phased approach pursued when evaluating technology introductions that have not been tested in a region.

Finally, participatory M&E is a necessary process for internal as well as external quality control and adaptive management of the IP. An M&E post-doc was assigned to each of the PLSs. These post-docs were more easily integrated into the activities of the Lake Kivu PLS, as they didn't have to work across different IPs. In the panel's view M&E was best integrated into the IPs in Lake Kivu, primarily because a committee was charged with that function.

The monitoring focused on the processes utilized within the IPs and farmers found the monitoring procedures for plots and trials particularly valuable. However, the M&E system has had to also generate comparable data across the PLSs and the system for that has only just been standardized and introduced into the TF's and IPs. A summary of the structure of that system is presented in Table 2.2.¹⁶ A diversity of monitoring tools is used in the system. Except in Lake Kivu, it was not apparent to the panel how effectively the M&E system is being used by the IPs in the other PLSs.

¹⁵ See for example Lake Kivu Pilot Learning Site, Linking Farmers to Markets: A Practical Guide, 2010.

¹⁶ Njuki et al. , J., Pali, P., Nyikahadzoi, K., Olaride P. and Adekunle A (2010) Monitoring and Evaluation Strategy for the Sub-Saharan Africa Challenge Program. Accra, Ghana.

Table 2.2: Indicators for the IP Formation, Functioning and Outcomes

	Key Indicators	Frequency of Monitoring	Tools used
IP establishment	Inclusiveness / representativeness of the IP	At the beginning of formation of IP and updated every year	IP Registers
	The IP has a well articulated common objective, issue being addressed and roles are well defined	At establishment and at end of each IP cycle (End of farming season)	IP evaluation tool
	Guidelines for establishing innovation platforms tested	End of each IP cycle	IP establishment protocol
IP Functioning	Consistency (frequency) of participation of IP actors	At every activity	IP Registers
	Quality and process of IP organized activities (establishment, setting research agenda, training events other	At every activity	Activity Report
	Number and types of knowledge sharing channels and number of male and female farmers being reached with information	At establishment and beginning of every year	Inventory of knowledge sharing tools IP evaluation tool
	Extent to which there is systematic planning, action reflection cycle within the IP	End of IP cycle (e.g. End of farming season)	After Action Review (AAR) IP evaluation tool
IP outcomes	Significant changes in interactions among IP actors / and or their organizations as a result of participation in the IP	At the beginning and every year	IP actor and stakeholder analysis
	Changes in the level of knowledge of interface issues by IP actors Changes in the level of knowledge on concepts and principles of IAR4D by IP actors		

c. Balance Between Productivity, Markets and NRM: Possibly the key idea to be implemented in this quite complex SSA-CP program was that of integrating innovations in the areas of productivity, markets and NRM in order to achieve impact on principal outcomes. The initial entry point was often the area within the research mandate of the Center or a target value chain, but the eventual intent was to work within the whole farming system and to understand the interactions and possible integration between these three areas. A synopsis of the theory driving this integration as an avenue to impact was that improved access to market would generate incentives for both farmer investment in improved productivity and NRM. There were very different approaches to entry point, phasing, and eventual integration across the three PLSs. The question was asked of farmers which area was most critical to improving their welfare. Most would say that there was no answer to that question. All were needed. One farmer expressed it as production and NRM are the same and absolutely essential but markets make the other two grow. Lake Kivu led with output marketing, KKM with productivity, and ZMM primarily with NRM, although one of the TF's focused on horticulture. Lake Kivu had the best balance across the three areas, ZMM was increasing the work on output markets, while KKM focused primarily on productivity and the links to and development of input markets. The panel did note that organizing seed production was a constraint and an area for collective action across all three PLSs, as was the issue of how to access, manage and prioritize credit.

The panel's view is that the Centers, when working within the context of the SSA-CP, have to move away from leading with their own mandate research outputs—even though this was principally driven by the competitive grants process--, as their utility will become evident as the IAR4D process is implemented. The mechanism and process for integration of research outputs from the Centers will become even more of an issue in the CGIAR reform process and framing this within the nexus of productivity, NRM, markets and policy will provide essential understanding of how to maximize uptake of those research outputs. Lake Kivu had developed the most integrated approach, including work on contour bunds, but it is still far too early to know how market access and farmer investment in productivity and NRM interact. Many of the problem areas are still worked (? dealt with?) relatively independently. As will be explored in the next section, this is an area for extended (=future?) research.

d. Partnerships: The IAR4D process provides a platform for linking across institutional boundaries based primarily on self-interest and mutual benefit. Partnerships are thus central to the operational modality of IAR4D. Universally, participants in the SSA-CP pointed to both the novelty and the benefits arising from working with such a diverse range of institutions and actors. There did not appear to be much institutional rivalry or protection of bureaucratic turf. This may be due to the lack of competition for funding that is apart from the initial competitive grants process, which did shift self-interest to the competition for funds. The effectiveness of partnerships will be explored briefly at three levels, namely that between CG Centers, between CG Centers and national partners at the Task Force level, and among partners at the IP level.

Collaboration between Centers was essentially at the level of the individual scientist. Virtually all the Centers perceived the SSA-CP as one more project, and often a very minor project with little spillover back into the Center's research programs. Even for those Centers who managed a Task Force, there was little interaction between the SSA-CP and other research programs. The SSA-CP had little visibility within the individual Centers, especially after the inception phase. At a management level within the Centers, few if any would have understood either the shift in research direction toward proof of concept or the operational modalities of IAR4D. This is despite many Centers using AR4D as a framework for their research programs. In this regard the SSA-CP did not achieve any effective alignment of research activities across different Centers, as for example seems to have been the case with the Generation or Harvest Plus Challenge Programs. Part of the reason for this was the shift in research objectives from those at the level of productivity and NRM—as delineated within the

competitive grants-- to proof of concept and socio-economic constraints. Another factor was the lack of an effective communication strategy within the SSA-CP, much less to principal institutional audiences. Finally, FARA was not in a position to broker such alignment across Centers.

Partnerships between Centers and national partners at the TF and PLS level were consistently collaborative, operated on the basis of equality and mutual respect, and worked on the basis of a clear division of labor. Most of the arrangements, however, were codified into MOUs and/or contracts. These more formal arrangements brought clarity to the roles and responsibilities of individual member institutions. As compared to the Centers, there was much more effective integration of IAR4D activities into national partner programs.¹⁷ It would be very useful to undertake a network analysis across the three PLSs to explore the extent and scope of these partnership arrangements. **The panel's preliminary assessment is that these partnership interactions are much more extensive within Lake Kivu, essentially because of its structure.** There is effective interaction between national partners at a regional level and these institutions noted the benefits of such interactions in terms of both learning as well as drawing on expertise at a regional level. Moreover, these partnerships and interactions had a very different character from regional research networks in that they were not as highly structured, were more flexible with a more open agenda, and were based on a higher level of reciprocity. Scaling up IAR4D within national will militate against maintaining such regional platforms and the question of whether they could continue under a different research program structure is discussed in the last chapter.

As described above, the partnership arrangements at the IP level, and particularly with farmer organizations and farmer members, vary depending on the extent to which the IP is managed within local government or extension structures. The intent to define an index for IAR4Dness will help in understanding the relative effectiveness of these different IP arrangements. This also would be aided by the network analysis mentioned above. Unfortunately there is no analytical capacity in that area presently within the SSA-CP. In Lake Kivu there have been efforts to formalize some of these arrangements as well, particularly with private sector actors. Contracting is a standard modality for institutional arrangements with the private sector and the IP is an intermediate entity through which to do this, given that most don't as yet have any legal status. MOUs serve well as an intermediate vehicle for specifying the business relationship between the IP and the company. What is possibly most interesting to evaluate-- this was not possible to do within the limited scope of the panel's review--is the interaction between the structure of the IP and that of the TF (or the PLS in the Lake Kivu case). In some cases the TF was relatively limited in membership and the IP was the area in which actor membership was expanded (and thus the IPs were quite independent of one another). In other cases the TF was quite broad in scope and members would serve on various IPs, although obviously increasing the transactions costs for those members. This will be an interesting issue to sort through in taking IAR4D to scale and efficiently managing transactions costs for some critical institutions.

2.4 Implementation Modalities for IAR4D

The three pilot learning sites (PLSs) evolved quite differently, and in that respect provide something of a comparative framework for the development and support to the innovation platforms (IPs)—this is explored in some detail in chapter 3. Details of the thirty-six IPs established under the SSA-CP, including their research focus, objectives, partnerships, and accomplishments are given in Annexes xx and xxx. Here, the panel discusses IPs in more general terms, as the main implementation modality for the continent-wide IAR4D program.

¹⁷ There is a basic asymmetry between CG Centers and national partners in terms of the effects of that a potential termination of the SSA-CP will have on ongoing program activities.

The IPs constitute the institutional innovation in IAR4D, and the methods and implementation of these was essentially led by CGIAR Centers, apart from INRAN leading the Sahel Task Force in KKM, ISAR leading the productivity Task Force in Lake Kivu, and Makerere University leading the NRM Task Force in Lake Kivu. The CG Centers had both convening power in the development of the IPs and could draw on regional technology networks across Centers working on the continent. This allowed relatively quick consolidation of the IP and speedy identification of best bet technologies in support of the IP process. Also, because of the very limited time frame to demonstrate proof of concept, there was a tendency to focus on quick wins on the productivity and/or markets side, with lower priority given to the longer term work required in NRM. These are among a number of success factors that have contributed to the rapid progress made by the SSA-CP in rolling out IAR4D, that may not fully apply in scaling out IAR4D, an issue that is addressed in the last chapter of the report.

Scale is something of a choice criterion in the establishment of the IPs, and is usually conditioned by selection of administrative level. The RCT forced that decision to sub-district level, what will be termed here local government authority (LGA); though IPs were established at the district level in ZMM. This is not an inappropriate level, particularly in terms of fostering bottom up approaches to selecting priority interventions and in terms of organizing farmers. On the other hand, higher levels would be appropriate where IPs were organized strictly around value chains. LGA was probably an appropriate choice of scale in piloting IAR4D, but it does raise issues about the cost-effectiveness in achieving wide coverage and taking IAR4D to scale if implementation is at this scale. This is an area for future evaluation, given that its evaluation was not possible within the RCT design.

The three PLSs also had quite different approaches to organizing the Task Forces (TF) in relation to their support to the IPs. This in part came out of the initial competitive grants process to select the three lead Centers or other institutions in each of the PLSs. As discussed in the first external review, the competitive grants process, as used in other challenge programs, did not match well the objectives of the IAR4D process, in that it produced considerable competition rather than cooperation, skewed the entry points toward Center research interests or mandates, and did not fill the skill set required to implement such an integrated program.¹⁸ Lake Kivu resolved this issue by organizing itself at the PLS level, rather than each TF operating independently, as was done in the other two. Thus, in Lake Kivu, each of the three lead institutions assumed responsibility for either productivity, NRM, or markets across the three countries, and each assumed responsibility for coordinating one of the countries. This was compatible with the significant heterogeneity in the region, as for example compared to the agroecological stratification in West Africa or the research program foci of Southern Africa, i.e., horticulture, conservation agriculture, and ISFM. This allowed a much wider range of entry points and best bets in the Lake Kivu PLS.

IP implementation had subtle but very important differences across the three PLSs. The Lake Kivu PLS, because it was not locked into the independent TF structure arising from the competitive grant selection, implemented their IPs later than the other two PLSs but on the basis of a more coherent methodology. This built on CIAT's Enabling Rural Innovation team based in Kampala where there was a consistent effort to monitor key processes in partnership development, as captured in the following, "current partnership practices in research for development may emphasize the outputs and products (technology impacts, adoption, income) and ignore process outcomes such as ownership, sustainability

¹⁸ In March 2006, the expert panel that reviewed the project submissions expressed concern about the content of some of these proposals, as well as about the suitability of the CGS by which the proposals had been generated. It noted that the proposal-preparation process had not encouraged the synergistic-collaboration among potential partners that was essential for obtaining full benefits of the proposed "integrated" R4D approach.

and development of national and local research capacity”.¹⁹ IPs in Lake Kivu were created *de novo*, as compared to the PLS in West Africa where IPs were embedded in existing institutional structures, especially in Nigeria. In Lake Kivu there was a higher degree of farmer ownership and management of the IP, as compared to embedding the IP in LGA structures or in extension structures, where farmer involvement in the IP was through leaders of village-level farmer organizations. This has been described as the IP breaking down existing vertical structures, as compared to merging the IP with existing organizational and administrative structures. Again, there is potential to evaluate the relative effectiveness of different implementation modalities, especially in terms of farmer participation and ownership in the IP, but this had to take a lower priority compared to the implementation of the RCT. Moreover, this would have required an evolving learning process and hypothesis development at the level of the SSA-CP as a whole, which has not yet been achieved within the program.

Finally, there were significant differences across the PLSs in terms of the degree to which the identification of critical entry points was kept open. Southern Africa defined its TFs and priority entry points in terms of the research foci of the lead Centers, i.e. horticulture, ISFM, and conservation agriculture. In West Africa entry points were defined primarily by existing crop and livestock systems. In part, this was because markets for these commodities were not considered to be a key constraint by farmers, especially given the relatively well developed road infrastructure in Nigeria. On the other hand, in Lake Kivu access to markets was considered to be the critical entry point for virtually all the IPs and this led to significant innovation in terms of identifying market opportunities and organizing more profitable value chains. Virtually all Centers lead with products flowing from their mandate research and yet the IAR4D process requires priorities to be a more emergent property of the process. The issue of the degree to which prior analyses, research outputs, or research hypotheses are imposed on the process is a critical trade-off that has run through the history of the SSA-CP. The ZMM PLS would argue that soil and water management is the key constraint for farming system in the Southern African region and that interventions at this level provide a base on which to build on value chains. On the other hand, a production system focus does not provide the potential buy in from the critical actors along a value chain like horticulture. If market integration is the key driver of smallholder intensification, then initial organization of IPs by value chains, as in Lake Kivu, and later adding on production system priorities could be the framework for effective IAR4D implementation.

These issues, which arise from a program like the SSA-CP with its broad comparative structure, are at the core of what the SSA-CP terms interface research between productivity, NRM, and market development. However, such research requires different methodological approaches from that required to carry out an effective RCT. The SSA-CP has yet to organize this research agenda in any coherent manner, which is not a criticism, but rather an indication of the trade-offs in research questions given the focus on proof of concept. The intersection of generating sustained productivity growth, integrating smallholders into input and output markets, and farmer investment in NRM is at the heart of smallholder development strategies in sub-Saharan Africa. Research on each of these topics is in general done independently and not in any systematic and integrated framework, e.g. in integrating farm and market level surveys. This is a multi-disciplinary research agenda and would have to be integrated into a program like the SSA-CP. However, the research design, while relying on panel data, would not employ the standardized questionnaire used in the RCT. In fact, how such a research agenda would be developed and implemented is itself an unanswered question, but one central to the future work of the CGIAR in Africa.

¹⁹ See P.Sanginga, et al, Enhanced learning from multi-stakeholder partnerships: Lessons from the Enabling Rural Innovation in Africa programme, Natural Resources Forum 31 (2007) 273–285.

2.5 The Core Research Support Team

Organizing the SSA-CP around an RCT proof of concept led to the need for capacity in survey methods, questionnaire design, monitoring and evaluation, database development, and analytical support. This was done through the creation of the Core Research Support Team (CRST), drawing primarily on talent across the participating CG Centers and building on the team that put together the research plan. Such a team requires a high level of skills, and the panel is of the view that the assembled team met that criterion. This is a high calibre team but because it is drawn from existing Center staff, it functions on the basis of partial time commitment, supplemented by a post-doc position for each of monitoring and evaluation and impact assessment for each of the three PLSs. The “team” consists of scientists who each take responsibility for a particular area, namely baseline questionnaires, monitoring and evaluation, database development, and impact analysis. This is a significant improvement over the use of consultants, which were used during the inception phase, and did training but provided no backstopping. However, the CRST is based on individual scientists and not on buy-in by individual Centers—those individuals must negotiate participation in the CRST with Center management. Because of this and competing work responsibilities, maintaining capacity of this core team has been and remains uncertain.

Given the skill sets required to implement an RCT of the scope required across the three PLSs, a core question arises of whether it is necessary to develop certain core, internal capacities within a program like the SSA-CP or rely on trying to ensure partnership arrangements on the basis of contracts—an issue that will also be central to the implementation of the CRPs. To a certain extent it is a moot point, given that the SSA-CP has effectively managed the process to date, although it is currently being tested in terms of the ability to undertake and analyze the second round of surveys. The task is made more difficult because a significant part of the activities are decentralized to the PLS and TF level, particularly survey implementation (often involving surveys particular to the work of the PLS), data entry and quality control, and initial analysis. However, to allow comparability across PLSs a certain part of both the baseline survey and M&E had to be standardized, and more important the ability to merge data across sites was key to the overall analysis of proof of concept. The latter was handled through the development of an innovative database development and management system called Quefax, developed especially for the SSA-CP—the database can be designed for the needs of the PLS but can be integrated at the level of the SSA-CP. A similar set of issues had to be dealt with in the design of the M&E system, especially the specification of IAR4Dness. Many of the complex issues dealt with in developing a panel survey capacity with the scope of the SSA-CP would be central to following the recommendation of the stripe review of social sciences in the CGIAR to develop such a panel survey capacity. The broad design of the SSA-CP research conforms to a principal recommendation of the review, namely that “...research would concentrate multidisciplinary teams using more sophisticated, larger-scale – internationally comparable, rather than project-specific – research designs to generate significant new actionable knowledge as to what works, what doesn’t, where, why and with what returns.” However, looking forward this would require a more dedicated research capacity to support such work.

2.6 Summary Statement on Current Status of the SSA-CP

Given the progress that has been made in the last three years, the review panel finds that the SSA-CP has not satisfactorily met the objectives established for this research phase, essentially because the time period of three years established for the proof of concept was too short. The expectation that the IP methodology would be worked through and implemented, that technologies would be tested, that market access would be enhanced, and that all of these would feed through to impact on farmer productivity and income is highly unrealistic, especially in the unimodal rainfall areas of West

and southern Africa. The latter had effectively two growing seasons to undertake the adaptive research and achieve significant adoption in farmers' fields, much less undertake the more complex and time extensive activities in market development, such as warrantage systems, or in NRM. Rather progress had to be measured by more intermediate outcomes inherent in the IAR4D process itself and yet the M&E framework has only been in place for a year and the data are not sufficiently complete at this point to provide an accurate measure of even intermediate outcomes across the SSA-CP. This is not a critique, as getting in place a functional M&E system within two years of a project's life is not out of the normal.

The SSA-CP is thus at a crossroads, in that it now has in place an extensive research infrastructure with a highly relevant research agenda and yet it faces in many ways an artificial deadline imposed within what could be considered an overly ambitious and unrealistic accountability framework. The second survey has only been completed in the Lake Kivu PLS, and a very preliminary analysis has been done, which essentially supports the need for a longer time frame to draw conclusive results. The second survey has not been carried out in the other two PLSs, partly due to coordination with when the cropping season. Thus, the SSA-CP, while meeting a number of important intermediate objectives, has not been in a position to meet the end objective of proof of concept.

Challenge programs were considered to be time bound but only the SSA-CP has been structured within a series of project phases, with it having been left completely open as to what would happen at the end of the current research phase. In other challenge programs there is an evolving set of activities based on the MTPs, with a commensurate resource mobilization strategy going forward. In the case of the SSA-CP donors have fully funded the inception and three year research phase, with continued funding commensurate, either implicitly or explicitly, on the results of the research phase and a completely new design for the next phase. This has left the SSA-CP at the end of 2010 without a clear result from the proof of concept and because of that, without a design for a next phase, and therefore without funding beyond 2010. It is difficult to see how this impasse could have been avoided without some credible external intervention with SSA-CP donors stating that the time frame was unrealistic and that a more orderly transition into a possible next phase was needed. **The SSA-CP experience highlights firstly the difficulty in specifying ex-ante a reasonable set of accountability targets within an appropriate time frame, especially in an area like agricultural research, and secondly in deciding on a course of action when those targets are not met.** These questions provide the background for an exploration of possible future scenarios for the SSA-CP in Chapter 4.

3. SSA-CP Governance, Management, and Finance

3.1 Overview of SSA-CP Management Structure

The original SSA-CP proposal envisaged a “preparatory phase” for selecting the first Pilot Learning Sites (PLSs), followed by “module 1” for validating IAR4D at three initial PLSs, and “module 2” for internalizing and integrating IAR4D in NARS agendas through expansion (i.e. up- and out-scaling) of IAR4D sites and activities. The first (preparatory or inception) phase was expected to cost USD 2.3 million; and the budget for full IAR4D implementation at three PLSs was USD 24.7 million, making a total of USD 26.0 million over five years, inclusive of the inception phase. The estimate for an additional six PLSs was USD 44 million, making the total program requirement USD 70 million over six years. The SSA-CP has yet to get to this scaling up phase and the period for full IAR4D implementation was redesigned into a proof of concept, research phase.

The inception phase during the 2005-2007 period had also been utilized by SSA-CP for establishing the program’s governance and management structures. At the regional level, for program governance, policy formulation, and oversight, the SSA-CP appointed a 12-member independent Program Steering Committee (PSC) reporting to FARA’s Executive Committee (subsequently renamed Executive Board). Membership of the PSC comprised of representatives of FARA, ASARECA, CORAF, SADC, NEPAD, advanced research institutes, farmers organizations, community-based organizations, NGOs, and private enterprise (1 member from each), and CGIAR Centers (2 members).

FARA’s Executive Secretary (subsequently renamed Executive Director) and the SSA-CP Program Coordinator were appointed *ex-officio* members of the PSC; and were supported by a Program Coordination Unit (PCU) led by the Program Coordinator. Accra-based FARA Secretariat staff were assigned responsibility for SSA-CP’s financial management, administration, and human resources; and a small Core Research Support Team (CRST) was appointed for facilitating program implementation, monitoring, and evaluation, and for undertaking the cross-site meta-analysis project.

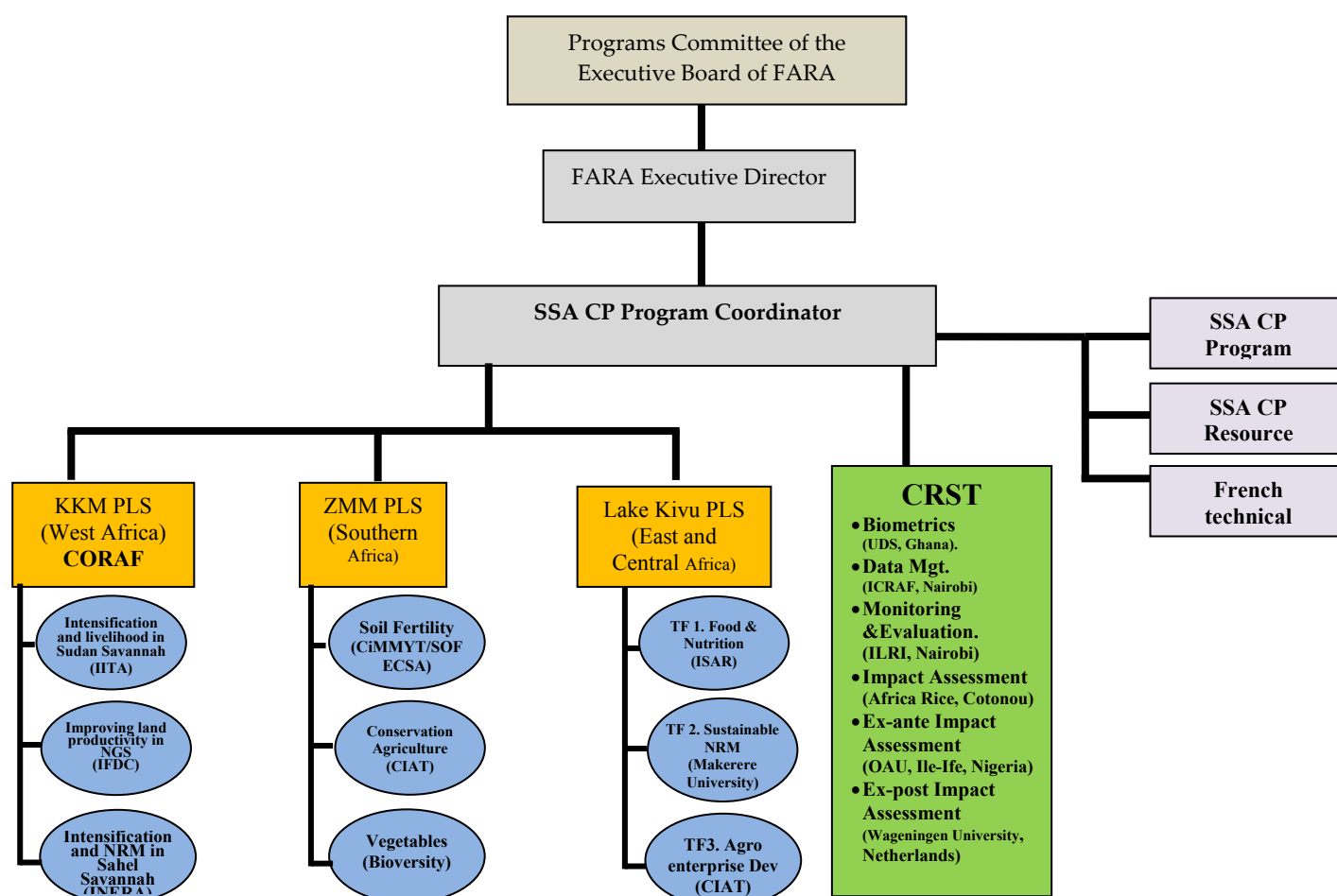
At the sub-regional level, three PLS Management Committees (MCs) were established, reporting to the PCU through the respective SROs. Each MC was expected to oversee and coordinate the work of three Task Forces (TF; nine in total), each led by a Lead Institution (LI) responsible for scientific, operational, and financial accountability as per terms of its Agreement with the SSA-CP and respective SRO. Each TF Leader was also responsible for establishing and leading the work of four Innovation Platforms (IPs; 36 in total). The IPs were expected to facilitate research on and implementation of the IAR4D concept in selected districts (and a total of 180 IAR4D-treatment villages), in accordance with the revised “research plan” for proof of concept.

By mid-2007, however, it became clear to the FARA Executive Board that though the PSC was performing its functions effectively, “transaction costs” (as per the CGIAR’s definition of such costs) were too high for the SSA-CP (23% in 2005, 35% in 2006, and 26% in 2007), and the governance structure had too many layers, thus making it inefficient. (These percentages for transactions costs, or what might be better termed overhead costs, were based on the relatively-low budgetary outlays during the inception phase, before the research phase was effectively implemented and the budget increased accordingly.) In October 2007 the FARA Board decided to disband the PSC and MCs with effect from November 2007, and to assign their oversight and coordination functions at the regional and sub-regional levels respectively to the Board’s Sub-Committee on Programs (PC) and the three SROs within which the PLSs were located. Three technical advisors were to be designated to backstop the PC’s oversight of the SSA-CP. SSA-CP’s current organogram is shown in Figure 3.1.

With this revised governance and management structure, program implementation got underway in January 2008, a full three years after the SSA-CP was originally launched. The program's research plan and MTP for 2009-2010 received unqualified approval from the CGIAR's Science Council. The SSA-CP's transaction costs for 2008 fell to 13% of the total expenditure for the year, in significant part due to the increase in budget; and were expected to fall to single digits as the program got fully underway.

For most of the SSA-CP's research phase, therefore, FARA's Board's PC has provided program oversight at the regional level; and CORAF has served as coordinator for the KKM PLS at the sub-regional level. However, because ASARECA and SADC were not ready in 2008 to accept the functions sought to be handed-over to them, CIAT (which was already serving as a PLS Lead Institution), and the SSA-CP's PCU (based in Accra) have been responsible for PLS-level oversight and coordination for the Lake Kivu and ZMM PLSs respectively. IITA, which had previously been the coordinator for the KKM and ZMM PLSs, continued to serve as one of the LIs for a Task Force in KKM, but not as a PLS-level coordinator.

Figure 3.1: SSA CP Organogram



Throughout the three years 2008-2010, responsibility for program implementation and management of the nine Task Forces has remained with their TF Leaders appointed by the respective Lead Institutions (LIs). Five of these institutions are CGIAR Centers, and the remaining four are other international or national organizations engaged in agricultural research in Sub-Saharan Africa. The Innovation Platforms (IPs) have been facilitated by the TFs. Membership of the IPs has varied by location; and has

generally been as originally expected—i.e., with representatives of farmers, farmers’ associations or clubs, government and non-government agencies, and private sector input suppliers and output buyers, depending on the IPs program-related needs and the availability and commitment of interested individuals.

3.2 Assessment of Governance and Management

Program governance and management proceeded relatively smoothly—but not without a few potentially-damaging difficulties—during the three year inception phase. The disbanding of the Program Steering Committee (PSC) in November 2007 was supported by many of FARA’s stakeholders in Africa, but understandably was less-well received by representatives of the CGIAR Centers who had helped develop the original IAR4D proposal and had continued to provide much-needed guidance and oversight to the program. Similarly, some members of the PLS-level Management Committees were not pleased that their role in guiding and coordinating the TFs in their sub-region had been summarily discontinued even before program implementation had actually begun. Moreover, the disbandment of the MC in West and Southern Africa was one contributing factor to the lack of interaction between TFs in those two PLSs.

At the regional level, the Board PC was already responsible for overseeing all of FARA’s projects and Networking Support Functions (NSF), and did not consider it inappropriate to also oversee the SSA-CP—which also was a “time-bound” activity like the other projects, and was a part of FARA’s NSF for partnerships and strategic alliances. The membership of the PC did not differ significantly from that of the now-discontinued PSC, and included representatives of the CGIAR Centers and Alliance. Also, the technical advisors designated to support the PC’s oversight of the SSA-CP were recognized scientists from the CGIAR and the region, and were expected to provide independent advice to program staff and the PC.

The Panel has not had an opportunity to observe a meeting of the PC or to interview its members in person. However, based on a review of presentations made by the SSA-CP at FARA’s annual Program Reviews—which are attended by members of the PC and the technical advisors/resource persons to each of the NSFs and major projects—and the minutes of PC and Board meetings for the period 2005-2009, the panel believes the PC has diligently exercised its program oversight responsibilities on technical matters related to the SSA-CP.

While the exclusive attention to the SSA-CP that would have been given by a separate PSC might have had additional benefits, it appears to the panel that adequate scientific Program oversight has been provided by the PC and its technical advisors. Furthermore, the benefits to SSA-CP—in terms of technical advice and support for collaborations with partner countries and institutions—that have come from its close integration with the other NSFs within FARA—as well as of the full support of a highly-regarded Executive Director, and of an Executive Board and FARA Assembly that have considerable political support in Africa—have been substantial.

Also, the principle of subsidiarity seems have been working reasonably well within the SSA-CP governance structure; and linkages between FARA’s NSFs (and hence the SSA-CP) and other similar programs in Africa (for example under the CAADP and FAAP) are being developed. These linkages have been facilitated by the FARA Board and its PC; and could expedite the achievement of SSA-CP’s longer-term objective of scaling-up and –out the benefits of the IAR4D approach to smallholders in Africa. **For all these reasons, the panel believes the current arrangements for program oversight are suitable, and does not consider it necessary to recommend any structural modifications in SSA-CP governance at the regional level.**

This is not to say that oversight of all SSA-CP matters by FARA's Executive Board and its sub-Committees has been fully satisfactory at all stages of SSA-CP implementation. An external governance and management review conducted in 2008 by consultants appointed by donors identified several deficiencies in Board operations. One such issue related to the utilization of about USD 2.7 million of (pooled) SSA-CP funds for core FARA operations. This had occurred in 2008 when donor support for FARA was lagging--in part due to delays in establishing a promised Multi-Donor Trust Fund (MDTF) for FARA--and the SSA-CP had a "surplus" of substantial "carry-over" funds because its program implementation in 2007 had been delayed due to pending approval of its revised research methodology by the CGIAR Science Council. In the absence of an accumulated "operational reserve" in FARA--as is required in all CGIAR Centers, for example--that could have helped it tide-over short-term cash flow difficulties, and facing a potentially-debilitating shortage of funds for FARA's routine operations, the Management had "borrowed" SSA-CP funds without first obtaining the concurrence of SSA-CP's donors.

In December 2008, two major donors to the SSA-CP asked external experts in finance and governance to conduct a thorough review of the FARA Board's governance policies, practices, and mode of operation. The consultants' reports made several recommendations for improving Board operations; and these were accepted by the Executive Board in February 2009. During the past 18 months, the Board has conscientiously and systematically followed-up on a comprehensive program of "Agreed Upon Procedures" (AUP), which have now been largely implemented, and have helped improve various aspects of FARA governance.

In addition, FARA's financial, procurement, and other administrative systems have been reviewed in 2009 in the context of preparing the MDTF Agreement, and a new operations manual has been adopted. A detailed review of FARA's financial management has separately been undertaken in March 2010 by an external consultant who, as the current acting head of Finance at FARA, is now responsible for implementing the review's recommendations. Annual external audits of financial statements, and periodic internal audits of FARA operations, have also been conducted under the guidance of the Executive Board's sub-Committee on Finance and Audit. The recommendations of these various reviews and reports are being followed up by relevant staff of the FARA Secretariat; and further improvements in financial management and accountability are thus presently ongoing.

Since some of FARA's finance-related decisions in 2008 were the source of considerable unease among SSA-CP's donors, these and related issues are further discussed below. Our review was also supported by a finance review and the detailed report on the management of SSA-CP funds has been shared with senior FARA staff for follow-up as appropriate. The finance report's key findings and conclusions, supplemented by the panel's own review of relevant Board minutes, external financial audits, internal audits and other reports, and discussions with staff at FARA headquarters and at the 9 TFs visited by the panel in Sept-Oct 2010, provide the basis for our overall assessment of SSA-CP's financial management and related governance issues.

Table 3.1 provides details of SSA-CP income and expenditure for 2005 to 2010. The total funds actually expended by SSA-CP since its inception in 2005 amount to USD 26.5 million (as of August 2010)--which is roughly equal to the amount (USD 26 million) estimated in the original 2004 proposal for the first five years of the program, including its inception phase. However, in the original proposal, by this time and with these funds the "full implementation" of IAR4D at 3 PLS was to have been completed. At first glance, therefore, since the research phase is still on-going, it appears that the original budget estimates were too optimistic and/or the SSA-CP has perhaps been less effective in utilizing available funds than was originally anticipated. These possibilities cannot be completely ruled out; but a closer

analysis of SSA-CP achievements and expenditures over the period 2005-2010 provides a more-complete picture, as discussed below.

Table 3.1: Income and Expenditures for 2005-2010

(Brackets represent credits; in USD million)

	2005	2006	2007	2008	2009	2010	TOTAL 2005-2010
	USD-m	USD-m	USD-m	USD-m	USD-m	USD-m	USD-m
Balance Carried Forward (C/F):	-	(1.790)	(2.328)	(7.479)	(7.093)	(3.183)	
Donor Contributions:							
The World Bank	-	-	(0.738)	-	-	(1.140)	1.878
Netherlands	(1.586)	(1.205)	-	-	-	-	2.791
Italy	(0.658)	(0.639)	(0.605)	(0.779)	(0.736)	-	3.417
DFID ¹	(1.080)	(0.119)	(4.053)	(2.341)	-	-	7.593
Denmark (Danida)	-	(0.391)	-	-	-	-	0.391
E C	(0.917)	(0.905)	(2.612)	(1.057)	(2.202)	(2.892)	10.585
Funds Received in Calendar Year (CY):	(4.242)	(3.260)	(8.008)	(4.177)	(2.938)	(4.032)	26.655
Total Income:	(4.242)	(5.050)	(10.335)	(11.657)	(10.031)	(7.216)	
Total Expenditure:	2.452	2.722	2.856	4.563	6.848	7.054	26.495
(Surplus)							
Shortfall:	(1.790)	(2.328)	(7.479)	(7.093)	(3.183)	(3.775)	

NOTES:

1. For DFID 2008: \$619,750 "amount receivable" from DFID
2. The 2010 expenditure includes "committed" amount of US \$3.613 million
3. Amounts in bracket represent funds received, or credits/balance "carried-forward"

Table 3.1 shows that more than USD 8.0 million was expended during the 3-year (2005-2007) "inception and re-design" phase, i.e., *before* the research phase could start in January 2008. Hence, the expenditure on the 3-year (2008-2010) "proof of concept/research phase" is actually USD 18.5 million (these expenditure figures are as of August 2010, but include a "committed" amount of USD 3.6 million for the remaining months of 2010). This expenditure is USD 6.2 million *less* than the USD 24.7 million originally envisaged for undertaking "full implementation" of IAR4D at 3 PLSs. This "funding gap" could perhaps now be filled, so that the pending research activities could be completed in the next 1 or 2 years.

Also, as shown in Table 3.1, the program has consistently shown a "carry-forward" of funds in each of the years 2005-2009—ranging from USD 1.8 million in 2005, to USD 7.5 million in 2007, and USD 7.1 million in 2008. This could indicate that the SSA-CP has perhaps used available-funds prudently, keeping in mind the absorptive capacity of the program's implementation partners. Program expenditures have closely tracked the actual pace of progress on the ground—which was initially slower than expected, but later picked up substantially, from USD 4.6 million in 2008 to an anticipated

USD 7.1 million in 2010. This approach has probably also reflected an evolving (perhaps better and more realistic) understanding of what is actually involved in implementing as complex and challenging a concept as “IAR4D in SSA.”

After the first three years—i.e., once the initial preparatory work had been completed, the methodology redesigned, the governance and management structure fine-tuned, and partnerships established in each of the PLSs--program attention shifted to the research phase. This required ensuring that the TFs and IPs adopted an IAR4D approach, the various partners contributed to a common goal, the core research support team (CRST) functioned as expected--and all of these actions were coordinated so as to make the achievement of SSA-CP objectives more likely. **In the panel’s view, the program’s expenditure pattern for 2005-2010 has reflected in part this “learning by doing” approach, and deserves to be commended.**

Another area in which considerable progress has been made by SSA-CP since 2005 is in reducing “transaction costs”--so that a greater proportion of donor funds are actually spent on the program’s research and research-related operational costs. During the inception phase, set-up costs included expenditures for proposal preparation, stakeholder consultation, methodology development, preparation of documents for Science Council approval, institutional development, project selection through a competitive grants process, benchmark-site selection, external reviews by consultants appointed by donors, lead-institution selection, and agreement/contract finalization. Since the SSA-CP was still in its formative years and actual research had yet to start, a relatively large percentage (35% in 2006) of the annual program expenditure was spent on what the CGIAR defines as transaction costs.

In 2008, as noted earlier, two “management” layers--the Program Steering Committee (PSC) and the PLS Management Committees (MCs)—were discontinued. The program guidance and oversight function at the regional level was assigned to the FARA Board’s PC; and pragmatic arrangements were made at the sub-regional level to ensure that the coordination functions of the (former) PLS-level MCs were handed over to CORAF, CIAT, and the PCU. With the growth in annual program expenditures during the implementation phase--supplemented by strict control over funds transferred to the TFs or used for the CRST and the PCU--the SSA-CP’s transaction costs have been significantly reduced during 2009 and 2010, to about 11% of total expenditure (see Table 3.2).

With regard to the administrative-cost layers associated with SSA-CP funds after they are received in FARA’s accounts, the panel notes that FARA charges a 5% administrative fee on pass-through funds, and an 18% administrative charge on budget allocations to the SROs and LIs. Together, these presently constitute about 7% of the total SSA-CP budget. FARA Management has indicated that based on a recent study carried out by its accountants using the “full costing methodology,” the administrative charge should be closer to 25% (instead of the current 18%). However, there is an additional layer of overhead expense incurred at the research level, which is capped at 10%, and is considered a direct cost to the project. FARA does not charge the SSA-CP for the PLS-level coordination in ZMM that it currently undertakes. This responsibility is expected to be handed-over to CARDESA when this SRO in Southern Africa is fully established, hopefully in the next few years.

The panel presumes that FARA’s various overhead charges are generally in line with those of comparable research institutions supported by the CGIAR, and also with the recently approved MDTF Agreement. It understands that these rates have not been changed during the course of program implementation, despite improvements in services provided by the FARA Secretariat. However, since the panel did not have the resources to examine in detail the appropriateness of these administrative charges, it is unable to comment further on this issue.

Table 3.2: Transaction Costs 2005-2010 (funds disbursed by expenditure category; in USD'000)

Transaction Costs in USD'000	2005	2006	2007	2008	2009	2010
Expenditure Item						
PSC meetings and field trips	84	103	36	9		
PLS Management Committee meetings		87	63			
Program Coordinating Unit (including operational cost, personnel costs, FARA General Assembly and synthesis of lessons learned)	546	612	634	593	725	500
External reviews including travel	18	58				
Project proposal evaluation		102				
Total Transaction Cost Disbursement	650	964	733	603	725	500
Total Non-transaction costs	1,802	1,758	2,123	3,961	6,122	3,827
Total Expenditure (including non-transaction costs) for the year.	2,452	2,722	2,856	4,563	6,848	4,327
Transaction Costs as % of Total Expenditure	26.5%	35.4%	25.7%	13.2%	10.6%	11.6%

The issue of “borrowing” some SSA-CP funds in 2008 for “core” activities of the FARA Secretariat does, however, merit further comment. **It seems to the panel that this decision--however necessary it may have seemed at that time to FARA Management, to tide over a “cash flow” problem due to unexpected delays in MDTF funding—was inappropriate, since it was not consistent with good accounting practice or with the legitimate expectations of SSA-CP donors for transparency of decision making.** It understandably led to serious misgivings amongst donors—which, in turn, led to a comprehensive review of FARA’s governance and management.

However, FARA Management and Board have now acknowledged the inappropriateness of their earlier decision; have largely implemented or are in the process of implementing the comprehensive and detailed governance reforms (AUP) recommended by external consultants appointed by donors; and have introduced a more appropriate financial management system, with separate accounts for each program/project, so that resources earmarked for the SSA-CP would no longer be pooled or intermingled with other funds. In addition, the MDTF for FARA is now operational, and is expected to provide adequate resources for its core operations. With all these improvements since 2008, a recurrence of such “borrowing” in the foreseeable future seems highly unlikely.

In addition, a “reserve fund” has been established, to help tide over future cash-flow uncertainties; a “deficit recovery plan” has been approved by the Board, and is being implemented; and the MDTF signed in September 2009 has provided for retroactive financing from 4 September 2008 to 3 September 2009 in the amount of USD 1.94 million. Also, upon the donor’s insistence, FARA Management and Board are ensuring that the funds “borrowed” in 2008 are expeditiously recovered for use by the SSA-

CP. During the period of the current review, the “outstanding” amount USD 14,000 has been repaid. Since this full repayment has been achieved, FARA remains hopeful that this particular donor may find it possible to provide the substantial “pending” amount that had been promised for 2008-2009 but has not yet been received by FARA for the SSA-CP.

During the past few years, FARA and the SSA-CP have also made efforts to improve financial monitoring and control. There are several indications of this: the annual external audits of FARA’s financial statements for each of the four years 2005 through 2008 were “unqualified”; the accounting records, reports, and staff are now of high quality; the accounting software package (the SUN system) is being upgraded, and is being better utilized; bank accounts are well managed; the financial aspects of procurement and HR management conform with applicable policies and guidelines, and are satisfactory; and the financial risk management framework and financial controls currently in place at FARA are adequate, though further improvements are needed in a few specific areas, and are planned. The various reports by the internal auditor (appointed in 2008) present a fairly positive assessment as well, though some deficiencies have been noted.

One such deficiency, spotted in 2009 by the internal auditor, has been the alleged misallocation of program funds (amounting to about USD 100,000) by one of SSA-CP’s national partners located in a West African country. The source of this problem has been traced to inadequate supervision by the concerned SRO for ensuring that the funds transferred to the partner were in fact used only for the intended purpose, and were properly documented and reported. The SRO had apparently misunderstood its role in overseeing the financial management and record-keeping undertaken by this partner, a Lead Institution for one of the Task Forces. The matter has now been brought to the attention of senior management of relevant institutions, and remedial steps are underway.

Since most of SSA-CP’s partners responsible for managing funds at the sub-regional and TF levels are the CGIAR Centers or other reputed organizations serving as Lead Institutions—which are themselves subject to the same international standards of financial accountability as FARA, and are regularly audited by reputable external auditors as well as the CGIAR Internal Audit Unit (or its equivalent)—such misuse or misreporting of SSA-CP funds is not presumed to be a common occurrence. Nevertheless, the case cited here is an example both of the real risks of working with sub-regional or country-level partners who might not fully appreciate or follow their accountability obligations to an internationally-funded program, as well as evidence of a functional internal control system in FARA—which in this instance worked as intended, and uncovered a managerial lapse or genuine misunderstanding of how established policy and procedures for financial monitoring and control are expected to be implemented below the regional level.

The panel understands that FARA Secretariat staff members plan to redouble their efforts to ensure that all SSA-CP partners are held accountable for, and are capable of, meeting their financial and other obligations to the program’s donors and to their own Managements and Boards. It notes also that all the SROs in Africa are currently in the process of establishing MDTFs that will be managed by the World Bank (as is being done for the FARA MDTF); and hence these SROs will be required to conform to the stringent fiscal accountability framework and operational procedures stipulated in their Fund Agreements.

In addition, efforts are underway at the SROs to build the capacity of finance managers and accounting staff, so as to ensure that they have the skills and professionalism to undertake their duties in the prescribed manner. These actions will yield desired results upon being properly implemented and monitored over the next few years. Similar efforts are needed in national partner organizations, but are possibly beyond the current mandate or resources of the SSA-CP. **Hence, to help overcome some of**

the continuing constraints during the next few years, the panel suggests that FARA and SSA-CP staff rely mainly on their own enhanced efforts--including regular internal audits of partner organizations below the regional level, where appropriate, supplemented by periodic financial reviews by external consultants as needed--to ensure that the SSA-CP's agreements with various SROs and other partners are fully complied with.

Besides the management of funds, these agreements with PLS/Task Force-level Lead Institutions (LIs) include the responsibility for effective and efficient planning and implementation of all program- and project-related research and other activities undertaken by the TF (through the IPs established by them). The TF Leaders' functions include budgeting, resource management, output delivery, partnerships, monitoring, and reporting. Financial administration, procurement, HR management, and operational logistics are the responsibility of LI staff, both at the TF field-sites and at LI headquarters. Some responsibilities for resource management and output delivery are sub-contracted to national partner institutions, through separate sub-agreements with the respective LIs, but ensuring that these sub-agreements are complied with remains the responsibility of the LIs and TF Leaders.

In the panel's view, based on our field-observations and discussions with staff and SSA-CP partners at various levels, the accountability chain for field-based IAR4D is now well established, and works reasonably well. It links the IPs to TF Leaders and their LIs, who in turn report to the respective SRO (or other organization/Unit assigned the PLS-level coordination function) and to the SSA-CP staff at the FARA Secretariat (the Program Coordinator and PCU staff). The Program Coordinator then reports to the FARA Executive Director; and oversight is provided by the Program sub-Committee and Executive Board, who ultimately are responsible to the FARA Assembly.

However, in the panel's view, at present this accountability chain seems to be weak at the SRO level. When it was decided in October 2007 to disband the PLS-level Management Committees (MCs) and hand-over their functions to the respective SROs, it was envisaged that the capacity of these organizations would be carefully assessed and adequately developed so that they could undertake PLS-level oversight and coordination. For various reasons, only some of which are related to the functioning of the SSA-CP, this has not yet happened satisfactorily, particularly in the Eastern and Southern Africa sub-regions.

For the most part, the TFs are working smoothly, but there seems to be little sharing of information or guidance across TFs, even within the same PLS, apart that is from Lake Kivu PLS. The coordination and learning that was expected to take place (through the MCs and SROs) at the Pilot Learning Sites and at the SSA-CP level through the PCU seems to be sporadic and opportunistic, rather than systematic and strategic. Lake Kivu stands out in this regard for reasons that are explored in the previous section. Now that the SSA-CP research activities are well-underway and the TF-management function is well established, little would be gained by reviving the MCs at all PLSs; but it appears to the panel that strengthening the PLS-level "learning" function would be very timely and beneficial as the program moves towards final evaluation and completion. **It is therefore suggested that a suitable Learning Forum with appropriate functions, membership, and operational resources be expeditiously established at each of the three PLSs, and that these Forums, facilitated by the SSA-CP's PCU, periodically share experiences and lessons with each other at the regional level.**

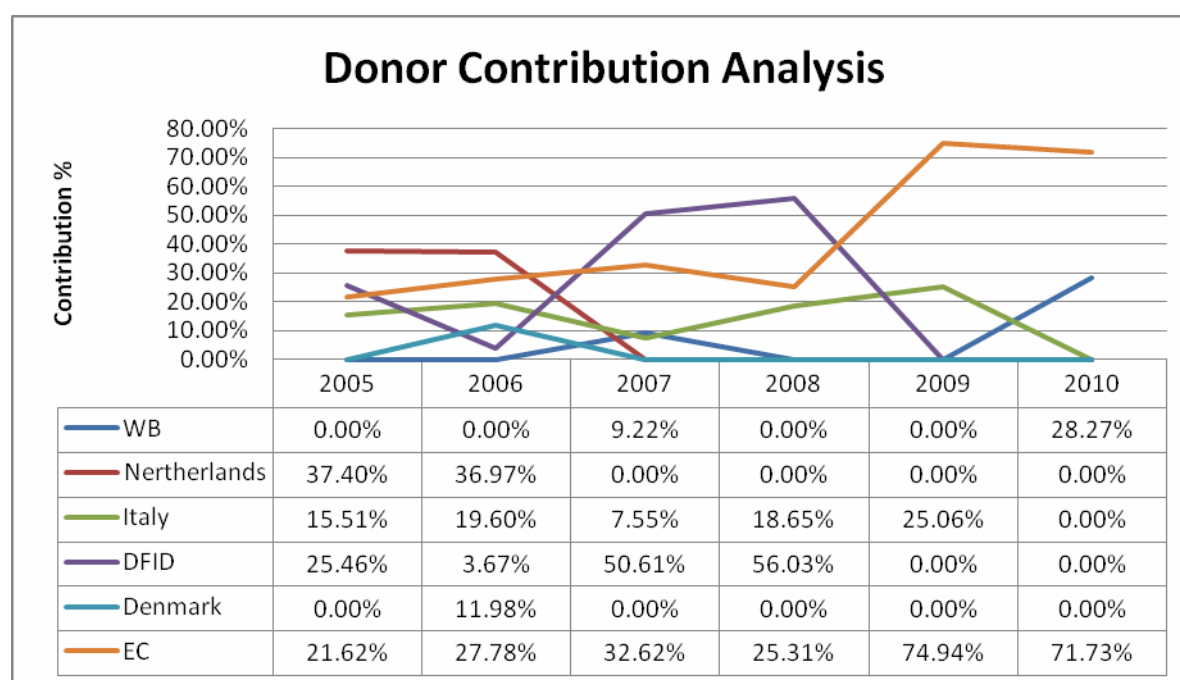
In this context, the panel notes also that the Strategy and Lessons Sharing Forum organized by the SSA-CP's PCU in mid-2009 was a step in the right direction, resulted in a useful (but too brief) synthesis report, and deserves to be followed-up with a more-systematic and comprehensive program for learning and disseminating lessons of experience of the SSA-CP. By the time the program ends, possibly in 2011 or 2012, it would have generated at least 4-5 years of field-based experience of

conducting and managing research on, and implementation of, IAR4D in three diverse eco-regions in SSA. **The panel is of the view that it would be unfortunate if this valuable and hard-to-duplicate experience is not fully documented and utilized, both by the SSA-CP and by its partners in various countries of Africa, and perhaps in other regions of the world as well.**

Another key area in which recent improvements have been made, but additional efforts are needed in the future, relates to the continuation of strong donor support for the SSA-CP. **Overall, the SSA-CP's donors—the EU, DFID, Italy, the Netherlands, the World Bank, and Denmark--deserve appreciation for providing sufficient funds** (in fact, USD 0.7 million more than the USD 26.0 million originally sought for the first five years of the program); and for ensuring that SSA-CP research activities have never actually faced a real-time “deficit” of financial resources (instead, funds were “carried-forward” at the end of every calendar year, throughout 2005-2009).

These observations, however, mask considerable volatility in donor support during the 2005-2010 period (see Table 3.1 above, and Figure 3.1 below). In 2006, five donors had contributed a total of USD 3.3 million; and in 2007, four donors gave USD 8.0 million. However, in 2008, three donors gave USD 4.2 million; in 2009, two donors gave USD 2.9 million; and in 2010, only two donors contributed funds to the SSA-CP, totaling USD 4.0 million. Only the EU- has provided funds for the SSA-CP in each of the past six years.

Figure 3.2: Donor Contribution Analysis



The recent drop in donor support could be due to several reasons. First, since its inception, the program has not spent what it had budgeted for the year--it spent only 29% of its budget in 2007, 46% in 2008, 68% in 2009, and by August 2010 had spent only 44% of its estimated budget for 2010. For the 2007-2010 period, the actual expenditure was only 47% of the estimated budget requirement. Thus the program's plans clearly outpaced its performance, at least in terms of spending money, but, as discussed earlier, the low levels of expenditure were probably justified. Nevertheless, it seems also that this “variance” between the actual and budgeted expenditures every year was not perceived by donors to be particularly unusual or problematic--and hence was not considered a “funding gap” that needed to be immediately filled.

Second, the program's annual financial reports have consistently shown a "carry-forward" of substantial funds (see Table 3.1). Since SSA-CP's progress reports showed sufficient funds in 2009 and 2010 for completing activities planned for 2010--after which the program was, in any case, expected to end--no "additional" funds were presumed to be needed during these years. And third, considering that the same European donors also provided funds through the EC, the SSA-CP's funding pattern may have reflected good "coordination" among the program's donors, thus ensuring that they provided additional funds only when needed.

These could be considered legitimate reasons for the recent "slow down" of funding for the SSA-CP. However, at the present time, many research activities are still ongoing, and will need to be completed in the coming years--so additional funding will almost-certainly be needed. Recognizing this, the SSA-CP has recently communicated with some donors seeking funds for pending research activities, so as to provide an orderly closing-out of the program and/or its smooth transition into another longer-term research program for Sub-Saharan Africa utilizing the promising--by then, hopefully, "proven"--IAR4D approach.

In addition, FARA Management is hopeful that its tighter oversight of financial management, expeditious implementation of governance and management reforms in accordance with the MDTF Agreement and the AUP, and other planned improvements in the financial management system--including changing from cash-based to accrual-based accounting and financial reporting--will help restore donor confidence and financial support in the near term future. The panel believes such an expectation is reasonable, considering that significant progress has been made in implementing the desired governance reforms, and FARA leadership is committed to ensuring the high standards of management and financial accountability expected of a "Center of Excellence" receiving public funds from its international donors.

This optimism notwithstanding, the current reality of the program is that at least one of its key donors has withheld funds until the issue of "borrowing" from the SSA-CP is satisfactorily resolved, and some other donors also seem to have "dropped out" in recent years, possibly waiting for the results from the proof of concept. **The panel is of the view that the multi-year financing stream for the program presently may be characterized as "soft" and unpredictable.** Though future funding remains uncertain, the TFs and IPs at all PLSs are highly-motivated to complete what they have painstakingly built over the years. The current activities of research and evaluation are necessary for reaping the benefits of past investments in the program; and SSA-CP partners and staff would be greatly disappointed if the ongoing activities of the current research phase were to be "suddenly" brought to a close by the end of 2010.

Hence, presuming that the program will be able to justify continued support from the CGIAR on sound scientific and strategic grounds, it would be logical for donors to soon provide sufficient "bridge funds" for SSA-CP operations for the first six months of 2011 or until the CGIAR, FARA, and other SSA-CP partners reach firm agreements on the future programmatic and funding requirements of the program.

This would allow the SSA-CP to move forward with confidence, knowing that its (and the FARA Board's) recent improvements in governance and management at the regional level have been recognized as a serious effort to fully meet the program's development- and other partners' high expectations. The panel concurs with FARA's Board that recent governance reforms have been significant. The panel believes that improvements were needed on various governance aspects during the formative years of FARA operations; the governance reviews in 2006 and 2008 by external

consultants were helpful; the Board has taken their recommendations seriously, and has followed-up as needed; and as a result, the Board's operations are in better shape, and are reasonably sound at present. Further advice has been provided in the financial report which is part of this review.

Nevertheless, the panel suggests that further efforts in strengthening SSA-CP oversight ought to continue, particularly in the area of financial management. Now that FARA has an MDTF Agreement in place; since 2008 has begun the process of aligning its books to conform with International Public Sector Accounting Standards (IPSAS); and other improvements in financial management are being introduced, many of the donors' previous concerns could be mitigated. As an additional measure, however, **the panel suggests that FARA closely monitor the fiduciary framework that the Consortium of CGIAR Centers may adopt in the future as the CGIAR moves towards a programmatic approach, and incorporate into its own financial management system any best practices that might emerge.**

Another continuing concern is the riskiness of the narrow funding base of the SSA-CP. In the panel's view, this needs to be addressed urgently by FARA and its donors, especially if the SSA-CP is expected to continue beyond its current end-date of 31 December 2010. Options to address this issue are further discussed in chapter 4.

4. Future Development of IAR4D and Future Scenarios for the SSA-CP

Two related but separate issues are addressed in this section, namely the future development of IAR4D and the future of the SSA-CP. This is set within the context of increasing recognition of the critical role of agriculture for development in sub-Saharan Africa, on the one hand, and the current reform process of the CGIAR, on the other hand. Alain de Janvry, building on his work on the 2008 World Development Report on agriculture, discussed in the Elmhirst lecture the need for a reconceptualization of agriculture's multifunctional role in development and in the process provided the rationale and yet the challenges for a program like the SSA-CP as follows:

Innovation, experimentation, evaluation, and learning must thus be central to devising new approaches to the use of agriculture for development. This requires putting into place strategies to identify impacts as we proceed with new options. Too much of our econometrics still reports un-identified "determinants" that cannot be used for policy advice because they measure correlates instead of causalities. To date, rigorous identification in agricultural economics remains more an exception than the rule, perhaps more so than in other branches of economics because of greater difficulty in doing so compared to health and education where most of the impact analysis has been confined. It is a serious and insufficiently recognized handicap in introducing new options as to how to use agriculture for development.²⁰

4.1 Emerging Inputs of the SSA-CP into the CGIAR Reform Process

It is safe to say that the SSA-CP, especially in its research phase, has very little visibility within the CGIAR.²¹ Moreover, it has largely remained outside the development of the CGIAR Research

²⁰ Alain de Janvry, Agriculture for development: New paradigm and options for success, Elmhirst Lecture, IAAE Conference, Beijing, August 16-22, 2009

²¹ This is seen in the following assessment by the CGIAR Social Science Stripe review: The Sub-Saharan Africa CP promises to be an important crucible for testing key ILAC/Innovation System propositions through its integrated

Programs (CRP's). Given that the SSA-CP is still very much a work in progress, the question arises of what the SSA-CP would bring to potential CRP's. The following is more of a general list, rather than potential links to specific CRP's.

a. Positioning in the Research to Development Continuum: Centers operating in sub-Saharan Africa have faced a virtual contradiction, namely that the lack of impact within SSA from investments in Center research has in turn sparked the demand for greater accountability in achieving development outcomes and therefore the need to move more into development type activities. At the same time CGIAR involvement in purely development work confuses its comparative advantage and leads to dispersion of effort around a host of fragmented development projects. The emerging solution to this core problem is to define a line where Centers are accountable and beyond which requires effective partnerships with development actors. The latter, of course, assumes that those actors have a strategic vision of how impact is to be achieved that is coherent with what the CGIAR is producing in terms of research outputs and that there is a framework to integrate those outputs in the pursuit of development outcomes.

The SSA-CP offers one approach to that problem. As the history of the SSA-CP illustrates, initial development and implementation of new, knowledge-to-action methodologies like IAR4D, particularly oriented to understanding how to achieve impact in areas like rural poverty and smallholder productivity, initially blurs the divide between research and development. Methodology development is recognized as a legitimate area for CGIAR research and this is best done in an implementation modality. SSA-CP did this at a scale rarely achieved for developing and refining new methods and at the same time evaluated the methodology in terms of its contribution to impact outcomes. **However, the view of the panel is that CG Centers have little future role in IAR4D implementation, i.e. the formation of IPs, beyond this piloting or developmental phase.** At the same time CG withdrawal implies the development of a strategy for scaling out through donors, which is only at an initial conceptualization stage within the SSA-CP. Moreover, this opens two quite different trajectories for the further development of the SSA-CP, namely a research trajectory and a scaling out trajectory, with the relative role of the CGIAR being quite different within these two.

What is also clear from the experience of the SSA-CP is that achieving impact on outcomes such as rural poverty and smallholder productivity in the African context requires an innovative organizational architecture that is only hinted at in the current development of IAR4D. Impact in sub-Saharan Africa is highly contextualized, especially within a bottom up approach, and yet the assumption is that there are certain principles and organizational arrangements that can be applied more broadly. IAR4D is one such example but the question is whether IAR4D becomes a critical methodology in the more systems-oriented research work such as in CRP1 or whether those organizational arrangements are facilitated by other programs. There is apparent growing interest in IAR4D as an approach, for example in the Agricultural Research Council of Nigeria, which reinforces the need for effective scaling out modalities.

b. Research on Development: The research area of the reinforcing interaction of productivity, markets, and NRM on smallholder incomes and rural poverty is central to agricultural development strategies on the continent, and the issues are especially salient given the expanding private sector investment in the rural sector and expanding rural financial markets. In questioning farmers in the IPs on whether one area had the most potential, most would say that it was a chicken or egg question, as all were needed. Another example of this is the observation by a potato logistics company in Uganda working with two IPs, one in the good market access stratum and the other in the poor market access stratum.

agricultural research and development (IAR4D) approach. But the CP's quite limited successes to date with IAR4D have failed to build confidence in the CGIAR's capacity to develop useful new insights and practices based around ILAC/IS.

Farmers with good market access were quicker to understand the importance of quality management (dehauling), grading, and organization into market groups. The higher costs of the company working with the IP with poor market access then gets to the issue of whether it would trade off those costs for social objectives, i.e. rural poverty, with their participation in the IAR4D process. Understanding how to balance strategies in each of these areas and then integrate them at local level is a research agenda in itself, and one that can be studied in an IAR4D process.

c. Benchmark Sites: When the research focus is on understanding how to achieve impact on outcomes such as rural poverty, specification of context is central to the task and more general understanding can be gained if done in some sort of comparative framework across different contexts. Benchmark sites are central to this type of research and in turn were central to the design of the SSA-CP. The delineation of the three sites within the frame of sub-Saharan Africa is described in Thornton, et al (2006).²² A hierarchical sampling strategy was imposed within the sites, namely districts, villages, households, and plots. What is important to observe from the SSA-CP experience, is that the sampling, and in some cases purposive selection, depends on the objective, which in this case was the RCT proof of concept design, which was different than a sampling design for a baseline designed to understand the interaction between productivity, markets and NRM. The issue of whether the specification of interventions should drive sampling design in benchmark sites or a more randomized design to monitor system change will be an important issue in the development of benchmark sites in many of the CRP's, and in turn the ability to monitor and understand change in the sites, principally through panel surveys, or test interventions in a rigorous way. The complexity inherent in the design of long-term trials, for example at Rothamstead, is magnified several fold when it comes to developing a data collection network within a benchmark site, and compounded further when done across benchmark sites. Because the sampling design for the RCT was not done within a completely randomized spatial or population based sampling frame, the use of the survey network for other purposes may be compromised. In that regard, RCT designs may have significant costs in terms of the longer term utility of the data structures. The converse is difficult to answer, namely can RCT's be imposed over a fully "gauged" benchmark site, and that in most respects will depend on the relative specificity of the intervention being tested.

d. Experimental and Quasi-experimental Designs: Experimental designs to evaluate programmatic impact using randomized control trials have been used primarily in the health and education sectors. These work through well defined delivery infrastructure, i.e. either health clinics or schools, and treatment units are relatively easy to define. That is not the case in agriculture, which is probably part of the reason that RCT's have been employed less in this field. The critical issue in the design of proof of concept in the SSA-CP was the definition of a treatment unit, namely how is IAR4D deployed in comparison to conventional, linear approaches. The innovation platform is the defining implementation modality for IAR4D, but what is the organizational locus for linear research to extension models? What would appear to be a relatively simple comparison, namely IAR4D versus conventional systems, actually turns out to be a very complex undertaking. Given that the treatment unit is at a larger administrative unit than a village, then the issues of controlling for selection bias, of sample size, and of comparability of treatment become major design issues with very large cost and implementation implications. How much should be spent on a rigorous evaluation in comparison to actually implementing a program, an issue that often divides development practitioners and research evaluators? The experience of the SSA-CP is that this knowledge into action program was led by research organizations—which created its own biases as discussed in previous sections—that were able

²² Thornton et al. 2006. *Site selection to test an integrated approach to agricultural research for development: combining expert knowledge and participatory Geographic Information System methods*. International Journal of Agricultural Sustainability, (2006) 4, 39–60

to fund and direct the RCT. Overlaying this design on a program led by development organizations would be much more difficult to implement, especially in a rigorous manner. While not ruling out the use of RCT's in the CRP's, their cost and the relative importance of the research questions they address should be central to the use of these techniques.

4.2 Issues in the Future Development of IAR4D

The concept of agricultural research for development (AR4D) in current development debates encompasses several principal concepts, namely aligning agricultural research with impact on key objectives, especially rural poverty, defining agricultural research within a broader innovation systems context, and integrating concerns about sustainability, climate change, and ecosystem services into the agricultural research agenda. All of this is conceptualized at a very general level and has little in terms of an implementation modality.²³ The SSA-CP very much leads the way in developing such an implementation methodology and furthermore within the context of sub-Saharan Africa. However, this is still in the very early stages of development and as suggested in previous sections there are emerging issues related to ensuring optimum effectiveness in different contexts. This section will briefly review the panel's assessment of those issues, as they then feed directly into strategies for scaling IAR4D up and out.

a. Choice of Scale of Operation: IAR4D is based upon a bottom up approach but at the same time must achieve cost efficiencies through an appropriate scale of implementation, especially in terms of organization of the implementation and coordination functions as vested in the Task Forces. Within the SSA-CP this was principally done at the sub-district or LGA level in terms of implementing the innovation platforms. To a significant extent this choice of scale was set by the requirements of the RCT and there was little potential for exploring alternative scales of implementation and the impact this would have on performance criteria of the IP, especially the trade-off between implementation costs and farmer ownership of the IP process. Choice of scale is obviously central to defining a process of scaling up and out of IAR4D. This will also depend on the degree to which IAR4D is built within existing institutional structures or it provides an independent platform for connecting different actors in the research and development process. The following two issues are an extension of the issue of choice of scale of implementation.

b. Value Chains vs. Production Systems: There are different organizational alternatives to the integration of productivity, NRM, and markets. However, these often assume different organizational scales. Value chains have an obvious commodity focus, involve the coordination of assembly and bulking, quality standards, processing, and potentially market diversification, with effective linkage to either domestic urban markets or export. Value chains are the principal organizational framework within innovation systems theory and are an effective means of organizing private sector participation. As in the Lake Kivu or ZMM region, they also provide the essential income generating potential for farmer investments in productivity and NRM. However, the question at an LGA level of which market innovations offer the best potential for farmer entry is very different from the question at a sub-regional or national market level of what is the most efficient organization of the supply chain. This implies a more hierarchical organizational structure of interlinked value chain IPs with more production system IPs. At the same time, NRM interventions often require farmer collective action at a watershed or forest margin scale. Interlinked hierarchical levels in the scaling up of IAR4D will be another design issue.

²³ See for example the GCARD background paper: U Lele, J Pretty, E Terry and E Trigo, *Transforming Agricultural Research for Development*, Report of the GCARD1 Global Author Team, GCARD1 2010 www.egfar.org which defines transformative agricultural research for development.

c. Embedding IP Facilitation in Existing Institutional Structures: Across the three PLSs there are very different approaches to the development of the institutional arrangements within which the IPs are facilitated and developed. Within the IAR4D methodology there is a critical function of providing an independent platform for linking key actors and institutions that would support the innovation process. In the Lake Kivu PLS IPs are developed outside existing institutional structures, providing an external forum for linkage between farmers, service providers, including the private sector, and market agents. The goal is to build self-determination in the IP, effective problem-solving capacity and in the end sustainability. This goal can be in conflict with the goals of some institutions, especially with the reinstitution of subsidies in many of the SSA-CP countries, including Nigeria, Uganda, and Malawi. As one farmer noted, the extension agency gives the seed and fertilizer and says nothing about how to use it, while the IP helps farmers source inputs and teaches farmers how to effectively manage them. The IP breaks what many describe as the dependency syndrome between many government and NGO programs and farmers. The process takes more time—IPs suggest a period of 5 years to be fully self-sufficient—, has been done in many areas where institutional structures are not well established, and requires an independent source of facilitation, provided in this case by the CG Centers.

The contrast is with West Africa, particularly Nigeria, which within its state-federal system has over time developed a sophisticated institutional structure in rural areas around a T&V based extension structure in what are called ADP's, which in turn are closely linked to administrative structures at the LGA level. In one state in 2003, the ADP's decided that group approaches were more effective and created 10,000 farmer groups of 25-30 farmers each. The ADP's also operated shops through which subsidized inputs were distributed. Many of the IPs in Nigeria operate through these structures, where the IP is chaired by LGA executive officer, the platform is dominated by ADP officers and in turn methods, and farmer participation is through existing group representatives. Several IPs note the ability of the IP to access subsidized inputs. **The panel's evaluation just on the basis of group dynamics found that the innovation potential in these IPs would appear to be hindered by embedding the IP in existing institutional structures.**

At the core of this issue of IP independence is what the M&E system in the SSA-CP is calling IAR4Dness. The M&E system is only just been put in place and can monitor aspects of these processes across the IPs in the different PLSs. Understanding relative effectiveness of the IPs in different institutional contexts will be critical to designing strategies for scaling up and out. This will be particularly important in scaling up, that is whether to use existing hierarchical structures in public sector organizations or to build such hierarchical structures outside these structures, particularly in order to accommodate the scale issues described above. The limited experience with funding innovation system projects, e.g. the World Bank's funding of the NAIP in India, has relied primarily on competitive grant mechanisms, primarily within the frame of public-private partnerships. In SSA the organizational depth and diversity in the rural sector is generally not comparable to India, and where it does exist, as for example in Nigeria, it tends to be government dominated. Thus, shifting an increasing effort within the SSA-CP to key issues that will affect the design of scaling up strategies will be important over the next few years.

d. Farmer Organization: In a sub-Saharan Africa context farmer organization is currently seen as an essential element in achieving cost efficiencies in service delivery, in organizing cost-effective bulking and assembly in value chains, and in empowering farmers. Initiatives to foster farmer organization, for example farmer field schools, micro-credit delivery, or the Nigerian example, have tended to focus on the 25-30 member basic functional group. However, facilitated group organization at this level is relatively resource intensive, as for example with the farmer field schools, and does not serve as an effective linkage point for actors within the private sector or as a mechanism for effectively reaching large numbers of farmers. The IP approaches farmer organization at the LGA level and either builds on

existing farmer organization, as in Nigeria, or establishes a process for organization at village level across the LGA—although to date on average about 20% of farmers are currently reached by the IP, a credible result given that the IPs have been operating for two to three years. There is a hierarchical organization for farmers at this level, with the IP operating as the linkage platform to both markets and service delivery organizations. For many of the IPs there is an autonomous organizational dynamic, where farmers see the benefit of joining the IP based on activities in the village. Farmers pay an entry fee and an annual membership fee to support the operational costs of the IP. At this level the IP can organize bulk purchases of inputs or bulk supplies of commodities, investments in small scale agro-processing, or storage capacity for innovations like warehouse receipt systems. As such this appears to be a cost-effective means of organizing farmers and linking them effectively to both markets and service delivery.

e. Farmer Training and Extension: Organizing a cost effective agricultural extension capacity in sub-Saharan Africa has been a core problem in delivering the results of agricultural research, particularly since the collapse of training and visit extension systems. Because the SSA-CP has been implemented on the basis of existing technologies and productivity has been a core focus, adaptive research, farmer training, and extension approaches have been a core activity of the IPs. Again, as might be expected, there are a wide range of approaches, varying from T&V approaches of lead farmer and demonstration trials to farmer training to participatory video. The SSA-CP provides a natural laboratory to evaluate the cost effectiveness of alternative extension approaches, a set of issues that are more tractable than comparing two models of research and delivery systems. Currently the SSA-CP employs whatever extension approach that was last employed by the extension service in order to promote relatively quick uptake by farmers. Given the clear importance of advisory services in the process of technical change, there is a critical research agenda that could be explored within the structure of the SSA-CP. These results also would feed into the design of a scaling out process for IAR4D.

f. Productivity and NRM Research within IAR4D: The research agenda of the SSA-CP is organized around understanding how to have impact on development outcomes in a sub-Saharan African context, one of the most important, if not complex, research questions within the work of the CGIAR. However, there is implicit in the IAR4D approach a question of how to organize more traditional productivity and NRM research based on bottom up approaches within an innovation systems framework. Agricultural innovation systems assumes that by creating effective linkages between research and other actors in the agricultural sector, that the issue of a bottom-up research agenda will solve itself. That, of course, is in no respect clear, even for NARI's, much less for the CGIAR. Problem resolution within the IPs requires relatively immediate solutions, while intractable problems like bacterial wilt in potatoes and striga in cereals are already being researched with uncertain prospects of overcoming these constraints. Given the site selection process and the spatial scope of the three PLSs, there might be the expectation of an emergent research agenda in the areas of productivity and NRM research. **That there was such an agenda was not clear to the panel across the IPs that were visited. Nor was it clear that there was a systematic process by which such an agenda would arise within the IAR4D process.** This is partly because local problem solving, especially within the system heterogeneity that characterizes the SSA-CP sites, does not translate well into strategic interventions that might move productivity levels of target crops to higher levels. This issue will be central to how the CGIAR might conceptualize its future role in IAR4D.

4.3 Scaling IAR4D Up and Out

The SSA-CP has generated interest in the IAR4D approach in several of the countries in which it operates, particularly Nigeria and Rwanda, and is compatible with Uganda's Agricultural Technology and Agribusiness Advisory Services Project funded by the World Bank. IAR4D is also becoming a

framework within which FARA and CORAF conceptualize their work with the NARI's. There will be increasing demand within FARA's program development to scale out IAR4D. This becomes one option in terms of how to design the next phase or transition of the SSA-CP.

a. Is IAR4D Ready to be Scaled Out: The RCT was designed to provide the answer to the question of whether IAR4D should be scaled out, that is, was it better than other approaches? The answer to this question will provide in essence the necessary conditions for scaling out, i.e. is there enough evidence to suggest that it works? A definitive answer is yet to be provided, at least in terms of whether IAR4D can generate impact on principal development outcomes. Nevertheless, the discussion in the last section raises issues of *how best* to scale out IAR4D, in many respects the sufficiency conditions on scaling out. **The panel has argued in this report that neither the necessary nor sufficient conditions for scaling out have been effectively addressed, which is not a criticism of the work done to date but rather an acknowledgement that the time frame has been far too short. However, the panel views that many of the issues explored in the last section could now be added to the research being carried out in terms of evaluating how best to scale out IAR4D.** Many successful pilot programs have failed when they have been taken to scale and many of the issues discussed above would be central to the design of such a process.

b. Modalities for Scaling Up and Out: Scaling up and out of IAR4D will be done within a completely different operational structure from that of the SSA-CP. In the first instance it will be based on national programs rather than implemented within a regional context. In the second instance there will be various options to consider in terms of the operational structure. Three options are briefly discussed here, just to give some sense of the issues in the decision making process.

One option as discussed above is to fund the IAR4D process through competitive grants. This could be done at the level of the IPs, if of an appropriate scale, as for example by funding value chain platforms. Alternatively, this could be at the level of funding the IP support capacity similar to the TF's in the SSA-CP. However, the experience with funding such capacity through competitive grants was not effective in linking key actors, at least within a spatially defined target area and where the array of capacity needed to implement IPs was underdeveloped. Competitive grants are not an effective mechanism where there are existing capacity constraints and the intent is to foster cooperation between agents and organizations. They might be an option in a strictly value chain format, but competitive grants are also time bound and some consideration must be given to whether the IPs serve as a temporary platform to solve some clearly defined problems or whether there is a longer time frame within which the IP evolves and develops a sustainable financing modality for its operations.

A second option is to vest the IAR4D process with a lead agency, such as the CG Centers or SROs led the IAR4D process in the SSA-CP. However, both acted as relative "honest brokers" within the IP development process, which would be more difficult to achieve with competing government agencies and ministries for a large scaling out program. Moreover, there are emerging questions within the SSA-CP about the ability to maintain independence of the IP process when it is embedded within existing institutional structures. This is especially so when there is a strong political dimension, as with the link between rural votes and subsidized inputs. To a significant extent the IP process challenges the mandates of extension, advisory service, or rural development agencies, especially where these are integrated with local government structures.

Another option is design an IAR4D facilitation agency, potentially with a semi-autonomous legal status. What functions such an agency would have, what capacities it should develop, and how it would be funded would be major design issues. An option in the development of such an agency would be to organically develop IPs, as has been done with farmer field schools which in general have

no particular institutional affiliation, and add specialized capacities as the process evolves. Obviously this option is a more radical one and requires some institutional experience in working within an IAR4D framework. The IAR4D process does involve a change in institutional incentives and leadership would be required in fostering such a process. How that might build on current capacities in the SSA-CP would be a question, for example in a country like Rwanda.

4.4 Recommendations for the Research Phase of the SSA-CP

The SSA-CP in the three years of the research phase has implemented a sophisticated RCT experimental design, designed and implemented an IAR4D methodology, executed the baseline survey, put in place an effective M&E framework, and completed an “endline” survey in Lake Kivu PLS which has been partially analyzed. This by any measure is an impressive set of research outputs in a three year period under the institutional and operational conditions found in many of the PLSs. The panel finds that a three year time period to establish proof of concept is unrealistically short, that is, to establish that development outcomes are achieved at village and farm level and these be expressed in double difference between baseline and endline conditions in treated and control villages. At this point the panel can only base its assessment of IAR4D on its interactions with the task forces and over half the IPs in the three PLSs. The enthusiasm of the task force members, the articulate expression by farmers of changes in behavior and material conditions at farm level, and the preliminary findings from the Lake Kivu PLS have persuaded the panel that there is sufficient potential in the IAR4D approach to argue for an extension of the research phase for another two years. The survey of partners/stakeholders of Challenge Programs undertaken by the Science Council in 2010 indicates firm support for continuation of activities being undertaken by the SSA-CP. The “internal review” of the program commissioned by the FARA Board in 2010—and undertaken by two eminent external consultants—provides evidence of strong buy-in and support by SSA-CP partners. Having decided on investing in the RCT approach and the costs associated with that, the SSA-CP can only achieve its research objectives with an extended time frame and two years would be the minimum. Moreover, as suggested above there are a range of emerging research questions that can only now start to be explored given the research infrastructure that is now in place.

The panel recommends an extension of the research phase of the SSA-CP for at least another two years but within the context of some key revisions to the research plan.

a. Possible Changes to the Research Plan: The panel accepts the conclusions of the review of the SSA-CP research plan by de Janvry and Sadoulet—the full report is in an annex. One of the principal conclusions of that review was the difficulty of overcoming selection bias in the specification of the counterfactual. The current design has two counterfactuals, an untreated control and a conventional, “linear” R&D control. The argument is that conventional R&D districts were probably chosen on the basis of particular criteria which biased them toward achieving greater impact, so that a comparison with IAR4D districts would potentially underestimate the contribution of IAR4D. The test of the hypothesis of whether IAR4D can generate an impact on development outcomes remains valid. The difficulty is in whether the current design can provide an adequate test of the superiority of IAR4D over conventional approaches. A fully randomized approach to jointly applying both IAR4D and conventional approaches would have been too costly, even if it were operationally possible. De Janvry and Sadoulet’s suggestion of randomization within a paired design is not possible to impose at this stage (except in a possible ex-post pairing), which leaves a determination of whether an instrumental variable method is possible to apply within the analysis to account for the unobservable biases. The CRST has to determine whether proceeding with the test of this hypothesis remains valid and the approach to use, on the one hand, and how much is lost in not testing this hypothesis, on the other hand.

The panel's view is that a lot has been learned and clarified in one of the first applications of RCTs within the agricultural research mandate of the CGIAR, that a truly randomized test of the potential gains of IAR4D over conventional approaches would have been too costly, and that a test of whether IAR4D can generate impact, particularly within a relatively short time frame, is in of itself a sufficient question to test, especially if it can be combined with better understanding of how the IAR4D approach achieved that result. Thus, an extension of the research phase would usefully be done in the context of adjustments in the ongoing research plan that takes advantage of what is currently in place and exploits emerging research questions that could have not been foreseen at the beginning of the deployment of IAR4D. Elements of such an adjustment to the research plan could include the following:

1. Execution of a mid-line, as well as an end-line survey.
2. Completion of a trader survey and systematic price collection in KKM and ZMM, comparable to that done in Lake Kivu PLS.
3. Assessment of factors that will affect scaling up strategies, with a corresponding assessment of whether the M&E framework is sufficient to analyze those factors.
4. Determination of whether research questions on the interaction between markets, productivity and NRM can be superimposed on the existing research design—this may involve development of a panel survey with a higher frequency of survey intervals.

Such an adjustment in the research plan will put even more demands on the CRST. **The panel views that this could not be done on a part time basis, as is currently done, supplemented by inexperienced post-docs. A full time scientist with experience in this type of research is needed. Moreover, there are hardly any SSA-CP scientists, apart from the coordinator, who have a comparative sense of how IAR4D is being implemented across the three PLSs. A communication and learning forum across the SSA-CP is critically needed and a more complete vision of the whole SSA-CP needs to be developed in those scientists that would lead the revised research plan.**

b. The Downside of Not Extending the Research Phase: The SSA-CP comes to an end by the end of December with no clear exit strategy, no donor commitments for extending the work, and very little in terms of unexpended funds from previous allocations. In many ways the SSA-CP is yet one more time limited project that organizes significant constituencies, achieves part of its projected project outputs, and then closes. Yet, a large number of IPs were set up, farmers and other stakeholders were trained in agricultural technologies, scientists were trained in IAR4D and RCT techniques, stakeholders invested a lot of time, energy and money in the innovation process, national programs and local administrative agencies committed themselves to the innovation process, and thus ending the programme by the end of December 2010 ("pulling the plug") would have rather far-reaching consequences for the IP process currently underway. The IPs are not yet at a self-sustaining point in their development, the IARCs and other organizations involved are likely to lose a lot of credibility, farmers and their organizations will see it as one more project that comes and then ends, and the investments in the process are likely to be largely lost at this point in time. What will remain of the entire investment in the project is a number of baseline surveys, "end-line" surveys and reports that will probably be largely inconclusive, because of the short time period and the limited number of field seasons. Expertise, credibility and networking infrastructure will probably be largely lost. Hence, pulling the plug by the end of December would be a fairly wasteful option: it would be an enormous disinvestment and would damage the reputation and credibility of many partners involved in this venture.

c. An Extension of the SSA-CP in the Context of the CGIAR Reform: Decisions on the extension of the research phase of the SSA-CP must be made in the context of the present reform of the CGIAR system.

The current directive is that all the challenge programs must be integrated into the CGIAR Consortium Research Programs (CRP's). Because this is a transition process, there are no definitive guidelines on how this will be done. There is some sense that the current commitments within the challenge programs should be brought to an orderly end and/or effectively transferred to a CRP, only two of which have currently been approved. Moreover, the SSA-CP is recognized as something of a special case, in part because it is managed by FARA and in part because of the perceptions of the program across the CGIAR, largely based on the inception period. This introduces some level of uncertainty in how an extension would be funded and under what recognized administrative structure. To a significant extent this will depend on the flexibility of current SSA-CP donors, especially whether they can continue to fund the SSA-CP directly as an ongoing FARA program or whether the funding must go through recognized CGIAR funding structures.

It is not within the brief of the panel to make any recommendations on the issue of whether or how the SSA-CP might be incorporated into one or several CRP's. **The panel would, however, note that there are a range of lessons learned that could be usefully incorporated into the design of several of the CRP's and that there is an existing research infrastructure into which several million dollars has been invested that could be usefully built upon as part of one of the CRP's.** To date there has been only limited interaction between the SSA-CP and the CRP design process, and certainly no consideration of how the SSA-CP might be integrated into the CRP structure. Some of these issues are alluded to below in the discussion of a possible research scenario in charting potential future development of the SSA-CP.

4.5 Future Scenarios for the SSA-CP

The SSA-CP was originally planned as a 15-year program. If the SSA-CP had been allowed to mature as a challenge program, how might it have evolved? Two scenarios are developed, one based on scaling out IAR4D and the second based on deepening the research agenda that the SSA-CP has initiated. As alluded to in the analysis above, these two scenarios involve very different implementation trajectories and as such are considered to be mutually exclusive in the sense that each has very different objectives driving the implementation. The scaling out scenario builds on a presumed positive finding in the proof of concept and the second charts the research agenda that was left largely unexplored by the focus on RCTs.

a. Scaling Up and Out Scenario: IAR4D at its heart focuses on breaking down traditional institutional boundaries, such as between NARIs and extension systems, and creating greater connectivity in the agricultural sector, although still relying on the specialized functions provided by the different organizations. In particular, IAR4D at its best gives greater voice to farmers and shifts the basis of government programs from dependency to self-reliance. IAR4D is thus primarily an organizational innovation, which makes scaling up—the process of vertical integration upwards from the LGA level used in the proof of concept—so critical in achieving the impacts that are evident within the piloting and evaluation phase. This involves the design of an implementation modality as discussed above and a financing mechanism—which in turn can be linked to incentive structures—, which essentially supports the transaction costs associated with achieving greater organizational connectivity. Because these decisions are essentially made at national level, FARA would have a significant role to play in fostering and guiding this process, potentially within the framework of the development of CAADP investment plans, which is currently in its early phase of being rolled out. FARA has the only existing research base that could be used in evaluating design options, although these need to be deepened, and thus is in a pivotal position in being able to advise on design options. In that regard FARA is positioning itself to be a platform for IAR4D on the African continent.

Scaling out, in turn, involves the process of facilitating the development of the innovation platforms at a wider scale. This process particularly involves the development of a facilitation capacity and quality control monitoring in the IP development process. In a scaled out model of IAR4D there are key questions of the scale at which both the private sector and research can participate across an expanding number of IPs, especially in relation to their capacity. Many NARIs have developed zonal or regional research stations, which would facilitate this process, assuming they could draw on expertise and technologies from elsewhere in the system, including the CGIAR Centers. One of the key advantages of the SSA-CP was the ability to access the best on-the-shelf technologies across CG Centers working in Africa. There is a key question of how this might be done in a more distributed and scaled up model of IAR4D. The CG Centers have been constrained in sub-Saharan Africa in their ability to achieve impact by the lack of effective downstream delivery capacity. IAR4D offers an organizational innovation that both facilitates the delivery process but combines new technologies with the other needs in terms of market development and NRM. It is not clear how the CGIAR would best operate in the context of scaling out IAR4D, especially given the reform process currently underway in the CG system.

One of the other lessons learnt from the SSA-CP is that the private sector can make an important contribution to the implementation of the IAR4D model. The private sector is often seen as more dynamic, flexible and responsive than government agencies. However, the private sector's primary objective is to sell their products or services and to make a profit in the process. If there are no opportunities for making profit, the private sector will not participate. A key feature of the IAR4D process is integrating farmers into markets and moving them from a subsistence to a market orientation. Farmers have to learn to deal with the private sector, e.g. organize themselves and negotiate favorable prices in input and output markets and organize some form of quality control of the products and services they receive and sell. Also, in the early stages of the establishment of the IPs, provision of credit becomes a key need, especially if investment is required in areas such as grain storage and small scale processing, and payment on the loan is dependent on the ability to effectively market the outputs. In general, the private sector must see the potential benefits to their businesses arising out of the IAR4D process in order for them to participate. At national level different sub-sectors are usually organized into associations, usually as a linkage point to government policy. There may be potential to do the same in an effectively differentiated IP process. Because such linkage is not based on market forces, some coordination capacity would be needed across specialized IPs. Effective linkage to the private sector will probably remain the more difficult part of developing a scaled out IAR4D process.

b. A Research Scenario: The history of the SSA-CP to a significant extent centered around the role that CG Centers should take in the IAR4D process and in turn how research was both defined and implemented. Methodology development is a critical area of NRM research within the CG system and innovative methodologies are seen as the vehicle for the generation of international public goods. However, rarely are new methodologies evaluated in any rigorous sense and nor is as much effort devoted to how the uptake of new methods might be promoted or scaled out—this assessment might also be said to apply to the whole area of agricultural innovation systems. To a significant extent the SSA-CP has charted quite new ground in how the CG Centers conceptualizes the research they carry out, which in turn is very congruent with the increasing interest by donors on evidence based approaches to research and development interventions. That process in itself has raised a series of important questions, particularly in relation to how and at what cost such evaluation is done, and in particular what role RCTs play in understanding how most effectively to have impact on development outcomes that the CGIAR has set for itself. The question then is whether there is a continuing research role for the CG Centers after the proof of concept phase is brought to a close and what that role should be. Certainly, the role of the CGIAR Centers should shift from the significant role they currently play

in implementing IAR4D within the SSA-CP, however crucial that role played in the refinement of the IAR4D methodology.

The focus on integrating productivity, markets and NRM as necessary to achieve key development outcomes was also a particular innovation of the SSA-CP, and makes the point that no one Center has the research base to effectively meet that requirement across the range of conditions present in the three PLSs. The SSA-CP did provide an example of how different Centers might bring their particular expertise into research on production and value chain systems. Thus, CIAT, CIMMYT, Bioversity, IFDC, IFPRI, and ILRI were all directly involved in the SSA-CP, while CIP, ICRAF, AfricaRice, and ICRISAT were indirectly involved, providing technical options to the IP process. Several Centers have remarked that the research questions were often very localized and too narrow to justify a significant investment in staff time. Most often the best available technologies were accessed from these Centers, and were the basis for the significant gains in productivity, although in a few cases these technologies could not do better than what was already available to the farmer. What was often less clear was how these technologies might be best integrated into the farming system, provide a foundation for market access, and be a focal point for better management of the natural resource base

The latter research questions are framed at a different systems level than where most CG Centers conduct their research. Moreover, research at this systems level is done within the context of existing farming, market, and natural resource systems. Thus, in the reform process there is particular focus on both framing the research problem and integrating the research within benchmark sites. The research agenda of the SSA-CP would most likely evolve into what is termed interface research or the interaction between productivity, markets, and NRM in improving farmer welfare. With the IAR4D process acting as the driver of changes in these three areas, the trader and farmer survey structure within the PLSs could be retrofitted to explore changes in these dimensions on both farmer behavior and welfare, especially with any scaling out of the IP process. A few other PLSs could be added, particularly the humid forest zone of West and Central Africa and possibly the Ethiopian highlands, particularly the drier parts. However, this would better be done in the framework of developing a set of representative benchmark sites for sub-Saharan Africa. The multiple country dimension in the demarcation of the benchmark sites has provided an interesting overlay of different policy and institutional contexts, although these are not yet well captured in the characterization and data collection process.

The present reality of pursuing such a research scenario would depend on the incorporation of the SSA-CP into the design of the CRP's, particularly CRP1. To date there has been little interaction between the two, although as this review has argued there are significant areas of experience in the SSA-CP that could be directly transferred to the development of the CRP's. There is in turn a critical question of how a set of representative benchmark sites for sub-Saharan Africa might fit into the structure of the evolving CRP's. Finally, as the recent stripe review of social science in the CGIAR argued, systematic panel data for farm households is an important resource, especially given the costs inherent in collecting such data and the relative scarcity of such surveys on the continent. The value of that resource increases with the time period and spatial scope over which that data is collected and the returns on investment are a function of how much analysis can be devoted to the data set, which is often a function of ensuring it moves into the public domain. The CG must also move beyond these cycles of very large investments in data collection, followed by limited analysis in relation to the potential of the data set, and usually no further investment in the resource.

Annex 1

CGIAR External Review of the Sub-Saharan Africa Challenge Program. Terms of Reference²⁴

BACKGROUND

Evolution of SSA-CP

The Sub-Saharan Africa Challenge Program (SSA-CP) began its operations following approval by the CGIAR at AGM'04. The Program is managed by FARA (Forum for Agricultural Research in Africa). As such, the program is not only a CGIAR Challenge Program but also part of FARA's Medium Term Operational Plan for its contribution to the Comprehensive Africa Agriculture Development Program.

The SSA-CP was planned on a new paradigm, "Integrated Agricultural Research for Development" (IAR4D). This paradigm is described to foster synergies among disciplines and institutions; and to take a systems approach to managing the interactions between different natural and human interventions in agriculture and to encompassing the domains of policies and markets, and the effects these have on the productivity, profitability, and sustainability of agriculture.

At the AGM '04 the SSA-CP was approved in principle for a five year period subject to a favourable assessment of its 18-month inception phase. The inception phase was intended to develop appropriate institutional arrangements and define the research priorities and expected outputs based on diagnosis of information from three initial Pilot Learning Sites (PLS).

In 2006, the SC commissioned an external review of the CP (CPER) to assess the success of the inception phase. Following the review, the CGIAR approved a 3-year research phase for the Program to test the benefits of an innovative platform—the IAR4D concept—in designing and implementing research at the interface of productivity, environment, policy and markets that would increase demonstrably the delivery of the benefits to the end users. The CP designed its research phase to focus on addressing three research questions: 1) Does the IAR4D concept work and can it generate International Public Goods (IPGs) and Regional Public Goods (RPGs) to end users?; 2) Does the IAR4D framework deliver more benefits to end users than conventional approaches?; and 3) How sustainable and usable is the IAR4D approach outside its test environment?. The program restricted the work to three PLS: Kano-Katsina-Maradi PLS on the border between south central Niger and north central Nigeria; Zimbabwe-Malawi-Mozambique PLS; and Lake Kivu PLS on the border region between Uganda, Rwanda and the DR Congo.

The Panel also recommended that the CP be again reviewed at the end of the research phase, which will be in 2010.

Change process in the CGIAR

This CPER is taking place at a pivotal phase in the CP and when the CGIAR is going through a historic reform. Research in the newly structured CGIAR will be primarily through large Mega Programs to which the CGIAR Centers and their partners will contribute

From the CGIAR's point of view, this review therefore needs to take into account the changing internal CGIAR environment and of this, three aspects in particular: i) The new CGIAR will operate under "streamlined arrangements and simplified, cost-effective operations without unnecessary complexity."; ii) The CGIAR's Strategy and Results Framework presents a collective research agenda for the Fund and

²⁴ To complement the CGIAR Challenge Program External Reviews (CPER) Guidelines (http://www.sciencecouncil.cgiar.org/fileadmin/user_upload/sciencecouncil/SC_Guidelines/CGIAR_Guidelines_CP_External_Review.pdf)

Consortium of Centers and it will be implemented through a harmonized approach to funding supporting a portfolio of Mega Programs that are large-scale research initiatives; iii) The Mega Programs are implemented by multiple CGIAR Centers and partners and they are intended to be linked to the broader agricultural research and development agendas for generating impacts.

The Consortium Board has indicated that the SSA-CP may not be integrated, as an entity, by any Mega Program. However, the CGIAR is in the process of building coherent Mega Programs from the best of the on-going activities. In this context it is very important that the CPER assess the CP and its components.

While the review is focused on the CP's research phase, the review also needs to evaluate the Program for its contribution to or application of a major partnership platform across diverse environments in the sub-Saharan Africa region. The findings must be of great interest to the SSA-CP's stakeholders at large, and they can serve the CGIAR's formulation of new research initiatives, partnerships and approaches; FARA in the broader context in which the Forum operates; and the several regional and sub-regional research organizations in SSA.

TERMS OF REFERENCE

The CPER will be conducted following the **CGIAR CPER Guidelines** (available at http://www.sciencecouncil.cgiar.org/fileadmin/user_upload/sciencecouncil/SC_Guidelines/CGIAR_Guidelines_CP_External_Review.pdf), taking into account the CGIAR changes described above.²⁵

Topics to be covered

Regarding the general intention and objectives of Challenge Programs, the CPER should address the seven programmatic issues as described in pg. 2 of the CPER Guidelines; and the four management, governance and partnerships issues as described in pg. 3 of the CPER Guidelines.

Specifically the CPER should:

1. Evaluate to what extent the SSA-CP has been successful in achieving the objectives stated in the Program's medium-Term Plan or providing substantial new evidence on the key questions posed:
 - i) Does the IAR4D concept work and can it generate International Public Goods (IPGs) and Regional Public Goods (RPGs) to end users;
 - ii) Does the IAR4D framework deliver more benefits to end users than conventional approaches;
 - iii) How sustainable and usable is the IAR4D approach outside its test environment; taking into account NARS capacity to operate this concept;
2. Assess the IAR4D approach as an operational concept and for its utility to identify clear research questions and priorities and the strength of impact pathways development as part of the concept;
3. Evaluate the processes to establish multi-stakeholder partnerships and the relevance, effectiveness and sustainability of the research partnerships at relevant levels, including the Pilot Learning Sites providing lessons on success and failure factors. To what extent have synergies, complementarity and ownership been achieved through the partnerships? Is there an effective system for internal knowledge sharing and communication across regions and research sites?
4. Evaluate the quantity, relevance and potential rate of adoption (as international regional or national public goods) of the other research outputs including technological, institutional and policy innovations, capacity building and databases;
5. Assess the cost, both in terms of funding and human capital investment, and likely or emerging benefits of the IAR4D approach, such as increased capacity, to both CGIAR Centers and African partner organizations;

²⁵ In addition to the documents listed in the guidelines, CPER Panel will be provided documents relevant for the CGIAR Change process.

6. An internal review conducted by FARA resulted in a change in the governance and management mechanism for SSA CP in 2008. It included: (i) phasing out of the PLS lead institutions and management committees by transferring their functions to relevant SRO structures; and (ii) dissolving the Program Steering Committee and transferring its functions to the Program sub-committee of FARA's Executive Board. The review should assess the experience with this new governance and management structure for the CP. It should determine: a) if there have been any perceived or real conflicts of interest in the governing body; b) if the governance body has provided effective and adequate oversight, including financial oversight; c) if there is a clear and effective M&E system in place; and d) what constraints and benefits for the CP (in terms of research, synergies, financial arrangements, etc) resulted from being under the umbrella of FARA governance;
7. Evaluate the financial management framework, processes, and systems to obtain an understanding of the extent to which SSA CP discharges its fiduciary responsibility. Also, address specifically the following questions on financial matters: a) how is the CP's multi-year funding ensured? b) is financial support diversified enough to avoid funding risks? c) how much is the deviation (if any) between budget and actual expenditures? d) what is the proportion of transaction costs to expenditure/budget/funding? e) what internal/ external audit arrangements are in place?
8. Evaluate the SSA-CP's exit strategy or a strategy for expanding or upscaling its activities;
9. Assess options and recommend the optimal option for continuing or scaling up successful components of CP under different scenarios, including amalgamation within a CGIAR Mega Program; or replication of the IAR4D model by other organizations in different sites;
10. Provide guidance for optimal management of the transition from the current phase to future activities under the scenario recommended by the Panel;
11. Provide recommendations to FARA and relevant partners on strategies for sustaining new institutional structures and platforms and momentum for collaboration created by the SSA-CP;
12. Highlight the most important lessons from the SSA-CP, including both positive experiences and drawbacks, particularly regarding research planning and priority setting, managing research at the interface of different research areas, and the operation of complex partnerships.

LOGISTICS

For **logistics** please see the "Implementation" section of the CPER Guidelines. The review is planned to take place between September and November 2010. The schedule for the review as well as contract details will be specified in the appointment note to panel members.

To the extent possible the review Panel should design its travel schedule to match with any CP's stakeholder meetings.

Annex 2

Biodata of Panel Members and Consultants

PANEL MEMBERS

LYNAM, John K. (USA) – Panel Chair

Position: Independent consultant

Expertise: Agricultural research for development, starchy staples, priority setting, impact assessment, institutional development, Sub-Saharan Africa, LAC.

Education: Ph.D., Food Research Institute, Stanford University (1978); M.A., Food Research Institute, Stanford University (1974); B.S., Dept. of Agricultural Economics, Ohio State University (1970).

Experience: Previously: 2005-07: Managing Director of Kilimo Trust with the responsibility of establishing and managing a new funding entity for smallholder agricultural development in East Africa; 1988-2004: Associate Director, Food Security Division, Rockefeller Foundation, Nairobi, Kenya; Developing a funding program for agricultural research and smallholder development in Eastern and Southern Africa. Principal areas of program management included developing a banana research capacity in Uganda; Social science research at ICIPE and KARI; Development of an integrated soils research agenda in East Africa; Integrating GIS and modelling in agricultural research planning and priority setting; Management of the collaborative study of cassava in Africa directed by IITA; Development of a research capacity for crop and resource husbandry in agricultural faculties in East Africa; 1997-88: Head, Economics Section, Cassava Program, CIAT. Duties related to design and supervision of economic research on cassava: On-farm research in cassava-based systems; Marketing and demand studies in cassava food and feed markets; Integrated cassava development projects; Research planning and priority setting within commodity research programs; Role of technological change in small farmer development strategies in Latin America; 1974-75: Visiting research fellow, Institute for Development Studies, University of Nairobi, Kenya; Memberships include: Board of Trustees, World Agroforestry Center (since 2010); Advisory Committee, Collaborative Crop Research Program, McKnight Foundation (since 2009); Advisory Panel, Harvest Choice (since 2006); Scientific Advisory Committee, CIAT's Tropical Soil and Fertility Programme (2007-09); Task Force, African Highlands Initiative (since 1993), Steering Committee, Cassava Biotechnology Network (1994-1999), Steering Committee, Global Change and Terrestrial Ecology (1995-1999). He has published widely on agricultural research and priority setting, sustainable development, agricultural economics and commodity issues.

HARMSSEN, Karl (The Netherlands)

Position: Senior Fellow, Centre for Development Research (ZEF), University of Bonn, Bonn, Germany, and Visiting Professor (Soil Fertility), University College of Agriculture and Environmental Studies (UCAES), Bunso, Ghana

Expertise: Soil physics and chemistry, soil fertility, rainfed agriculture, environmental issues, spatial information systems, land use planning, research management, education and impact assessment.

Education: Ph.D. (Agricultural Science), Wageningen University, Wageningen, The Netherlands (1977); M.Sc. (Soil Chemistry and Physics, Mathematics, and Statistical Thermodynamics), Wageningen University, Wageningen, The Netherlands (1973).

Experience: Director, UN University Institute for Natural Resources in Africa (UNU-INRA), Accra, Ghana (2005-2009). Director, Center for Space Science and Technology Education in Asia and the Pacific (CSSTEAP), Dehradun, India (2002 - 2005). Professor of Environmental Systems Analysis, ITC (1997-2001); Rector, International Institute for Geo-information Science and Earth Observation (ITC), Enschede, The Netherlands (1997-2000); Executive Director, ICRISAT Sahelian Center, West and Central African Programs, Niamey, Niger (1994-1996); Director, Resource Management Program, ICRISAT, Patancheru, India (1992-1994); Director, Institute for Soil Fertility (IB), Haren, The Netherlands (1986-1992); Soil Scientist and Leader, Nitrogen Program, Agro-Economic Division, International Fertilizer Development Center (IFDC), Muscle Shoals, USA (1984-1986); Senior Soil Chemist, Farming Systems Research Program, ICARDA, Aleppo, Syria

(1980-1984); Project Leader, Soil and Groundwater Quality, State Institute for Drinking Water Supply (RID), Leidschendam, The Netherlands (1977-1979). Fulbright-Hays Scholar, Department of Agronomy, New Mexico State University (NMSU), Las Cruces, USA (1978). Corresponding Member, Basic Sciences, International Academy of Astronautics (IAA), Paris, France (2006). Honorary Fellow, Indian Society of Remote Sensing (1999), President, Dutch Soil Science Society (2001-2002). Visiting Professor, Center of Environmental Science, Anna University, Chennai, India (2000-2002), Officer, National Order, Niger (1996)

SACHDEVA, Paramjit (Pammi) (USA/India)

Position: Independent Consultant

Expertise: Program and institutional assessment, recruitment, and human resource management in the agricultural research and public health sectors

Education: Ph.D. (Social Systems Sciences), The Wharton School, University of Pennsylvania, Philadelphia (1988); MBA (Organizational behavior and human resource management), The Indian Institute of Management, Ahmedabad (1971).

Experience: Recent clients include the World Bank, FAO, WHO, AGRA, CGIAR Centers, Islamic Development Bank, and the Global Water Partnership. Prior to this, he worked for over twenty years in the World Bank and the CGIAR, retiring in 2001 as adviser. At the CGIAR Secretariat, he undertook or facilitated comprehensive assessments (EPMRs) of the governance, strategy, programs, organization, and management of twelve of the fifteen CGIAR-supported international agricultural research Centers; and served as member of the CGIAR gender and diversity advisory board, and of various CGIAR task forces and working groups. At ISNAR, he served as Chair of HRM working group and head of training program; and led a research project on the organization and structure of national agricultural research systems in developing countries. He has served as Panel member in the EPMRs of IITA and WARDA (2007).

CONSULTANTS

Finance report

BURNLEY, Emmanuel (Cameroon)

Position: Financial Management Consultant, Emmanuel Burnley, CPA, Atlanta, GA

Expertise: Certified Public Accountant with Expertise in Cash Forecasts, Business Valuations, IRS/DOS/SBE/CPA Audits and Pension plans, Financial and Strategic Planning, Complex Business & Tax Issues, Budget Development & Management, Accounting & Financial Operations, Business Expansion & Start-ups, Crisis Management, Staff Management & Development and Merger & Acquisition Negotiations. Plan, organize, staff and administer audits of for profit and non-profit organizations, including IRS compliance reviews, preparation of financial statements, preparation of income tax returns (forms 1041, 1120, 1065 and 990), 501©(3) filings and reporting, evaluation of accounting systems and internal controls and recommendation of procedural improvements to management.

Education: BA in Business Administration (Accounting) Howard University, Washington DC (1985)

Experience: Current position since 2008. Independent Consultant with a sound understanding of Generally Accepted Accounting Principles (GAAP) and Generally Accepted Auditing Standards (GAAS). He has experience implementing Enterprise Resources Planning (ERP) Systems for commercial and Nonprofit Organizations. Currently, he serves as Accountant and Financial Consultant for the International Fund for Agricultural Research, a nonprofit organization in Washington DC. Previously: Principal Oracle ERP Consultant, Accenture, LLP, Atlanta, GA (1999-2008); Chief Financial Officer for Applications Technologies, Inc., Bethesda, Maryland (1997-99); Associate CPA, Management Consulting for Professionals, Bethesda, Maryland (1990-97); Senior Accountant/Manager, Thompson & Associates, Washington DC (1985-89).

Assessment of experimental design

DEJANVRY, Alain (France)

Position: Professor, Department of Agricultural and Resource Economics, University of California at Berkeley, USA.

Expertise: Agricultural economics, policy, rural development, poverty analysis, impact analysis

Education: Ph.D. (Agricultural Economics), University of California at Berkeley, USA (1966); M.Sc. (Agricultural Economics, University of California at Berkeley), USA (1965); M.Sc. Statistics (1965); Ingenieur agronome, Institut National Agronomique, Paris, France (1962).

Experience: Assistant Professor (1966) to Professor (present), and Chairman (1985-89), Department of Agricultural and Resource Economics, University of California at Berkeley. Fellow of the American Agricultural Economics Association and a member of the French National Academy of Agriculture. Chairman of the Giannini Foundation (1987-89). Project specialist for the Ford Foundation, Buenos Aires, Argentina (1968-71). Visiting Professor, Catholic University of Chile, Santiago (1973-74), the Indian Agricultural Research Institute, India (1980-81) and the Centre d'Etudes et de Recherches en Développement International. His research deals with issues of rural development, poverty reduction, quantitative analysis of development policies, impact analysis of development programs, technological innovations in agriculture, and the management of common property resources. Ford Foundation staff in Bogota, Colombia (1976). Consultant or grantee: Ford Foundation, Rockefeller Foundation, Inter-American Foundation, Inter-American Institute for Agricultural Cooperation, Government of Mexico, FAO, IFAD, ILO, OECD, UNDP, CESAR (Italy), ADC (China), Dominican Republic Government, USDA/ERS, USAID, World Bank, IFPRI, UN Commission for Latin America, Title XII Morocco, Title XII Pakistan, USAID/University of California project in Egypt, Winrock International, and Sigma One. Panel member 2nd EPR of IFPRI (1991) and Mid-Term Review of IFPRI (1992); Chair of the study on Socio-Economics and Policy in the CGIAR (1985). Panel Member IWMI 1st EPMR (1994); Member of CGIAR Technical Advisory Committee and Science Council (1998-2004).

SADOULET, Elisabeth (France)

Position: Professor and Research Economist, Department of Agricultural and Resource Economics, University of California, Berkeley

Expertise: Agricultural economics, rural development, impact analysis, policy

Education: PhD, University of Geneva (1982); MSc, University of Lyon, France (1968), BSc, University of Lyon, France (1966)

Experience: Current position since 2001; Previously Associate Professor and Research Economist, Department of Agricultural and Resource Economics, University of California, Berkeley (1995-2000); Development Research Group in Economics, The World Bank (1999); Advisor, MIMAP Program, the Canadian International Development Research Center (since 1997); Lecturer and Assistant Research Economist, Department of Agricultural and Resource Economics and Development Studies, University of California, Berkeley (1985-95); Consultant to: FAO, The Government of Mexico, The World Bank. Core team for the World Development Report of 2008. Editorial board, *World Bank Economic Review*, *Agricultural Economics*; *Revue d'Economie du Développement*, *Revista Politicas Agricolas* (different periods); Invited professor at the University of Clermont-Ferrand, France (several terms); Scientific Advisor to the Courant Research Center, Göttingen, Germany; Member, Scientific Committee of PARADI, Center for Research on International Development in University Laval (Québec) and University of Montréal (1992-96). Consultant to Plan Sierra, a regional development program in the Dominican Republic, The World Bank, and Development Technologies.

Annex 3

SSA-CP Review Panel itinerary

18-23 July, 2010, John Lynam attended SSA-CP strategic planning workshop in Ouagadougou, Burkina Faso and the General Assembly of FARA.

6-8 September, 2010, the Panel met in Ghana, Accra for initial interactions with the SSA-CP and FARA leadership and staff and for internal meetings. The Finance consultant visited the FARA headquarters and Program office at the same time.

From Accra, Karl Harmsen and Pammi Sachdeva went on to visit the ZZM PLS in Eastern and Southern Africa and John Lynam visited the Lake-Kivu PLS.

ZZM PLS visit 9-18 September. The Panel team met SSA-CP staff, partners and stakeholders and visited sites in Zimbabwe and Malawi. The visits were hosted by CIAT, the Soil Fertility Consortium for Southern Africa (SOFECSA) and The Vegetable Task Force. In Zimbabwe the team visited CIAT-Conservation Agriculture site in Wedza and SOFECSA site in Makoni. The team subsequently travelled to Malawi where they visited a SOFECSA site and a Vegetable site in Zomba, a CIAT-Conservation Agriculture site in Balaka, and a Vegetable site in Mulange.

Lake-Kivu PLS visit 9-18 September. The Panel member was hosted by CIAT and SSA-CP Task Force coordinators, and met SSA-CP staff, IP representatives, partners and stakeholders in Rwanda, Democratic Republic of Congo and Uganda. In Rwanda he met stakeholders and partners in Ruhengeri and visited niche markets, potato washing station, milk collection at Mudende action site and a counterfactual site nearby. He visited an IP and held meetings with IP representatives in Goma, DRC. In Uganda he held talks with representatives of three Task Forces, CIAT staff, and other partners. In Kisoro and Kabale he met IP representatives, visited a weather station, a counterfactual site and value chain sites. He also observed market/trade survey activities.

19-20 September the Panel met in Nairobi for internal discussions and had talks with the DG and staff of World Agroforestry Center.

KKM PLS visit 10-16 October. John Lynam and Karl Harmsen were hosted by Professor Emechebe and other SSA-CP staff, and met SSA-CP staff, IP representatives, partners and stakeholders in Nigeria and Niger. In Kano, Nigeria, they had general briefings of the PLS and met with the Sudan Savannah (SS TF), Northern Guinea Savannah (NGS TF) and Sahel Task Force representatives and partners. They visited Maize-Legume-Livestock IP in Bugure, and from Katsina they visited Sorghum-Legume-Livestock IP in Safana; both under the SS TF. They also visited Zaria where they met NGS TF partners, and Ikara and where they met Maize IP partners. In Zuntua they met Rice IP partners. In Maradi, Niger, they met Sahel TF, visited INRAN and Groundnut and ISFM IPs of the Sahel TF.

17 October John Lynam and Karl Harmsen visited FARA headquarters and SSA-CP office in Accra for debriefing FARA/SSA-CP of the Panel's findings following all field visits.

Karl Harmsen visited SSA-CP's two key donors, the EC and DFID on 8th October and 5th November, respectively.

The assessment of the Experimental RCT design was done as a desk study.

The ISPC Secretariat conducted virtually a survey among SSA-CP's partners and stakeholders.

Annex 4

Documents made available to SSA-CP External review team

1. Proposals and reviews

- SSA-CP CPER Specific Term of Reference
- CGIAR guidelines for CP external review
- SSA-CP full-proposal, 2004: Building Sustainable Livelihoods through Integrated Agricultural Research for Development
- SSA-CP annexes to full-proposal
- SSA-CP background papers to full-proposal (reference materials from the consultative program development process)
- Science Council Assessment of SSA-CP full-proposal, 2004
- CGIAR, Annual General Meeting 2004. Business meeting. Summary Record of Proceedings
- EU SSA-CP Review, 2005
- Sub-Saharan Africa Challenge Program External Review, 2006
- Science Council Commentary on SSA-CP External Review, 2006
- FARA's Response to External Review recommendations
- Report (Lessons learned to date during the Inception Phase of the SSA-CP, with particular emphasis on international public good (IPGs), 2006
- Internal Review, 2010

2. Medium-term plans and annual reports

- SSA-CP MTP 2007-2009
- SSA-CP MTP 2008-2010
- SSA-CP MTP 2009-2011
- SSA-CP MTP 2010-2012
- Science Council commentaries on SSA-CP MTPs 2008-10, 2009-11, and MTP 2010-12
- SSA-CP Annual Report 2005
- SSA-CP Annual Report 2006
- SSA-CP Annual Report 2007
- SSA-CP Progress report for January-December 2008 and proposed 2009 workplan and budget

3. Documents on methodology and evaluations

- IAR4D White paper, 2009
- SSA-CP Research Methodology (Research plan and programme for impact assessment), 2009
- SSA-CP Research Plan 2008-2010, PPT
- Proof of IAR4D concept – approaches & baseline economic study results & implications, PPT
- Synthesis Report: Strategy and Lessons Sharing Forum, 2009
- Second Strategy and Lessons Sharing Forum, Book of Abstracts, 2010
- Monitoring and Evaluation of Innovation platforms, innovations, field level, processes and outcomes
- SSA-CP codes for baseline data (codes for households, plot codes, stakeholder codes, village characterization codes)
- Selecting sites to prove the concept of integrated agricultural research for development
- Baseline questionnaire (household module, plot characterization, village characterization)
- Baseline reports
 - Baseline NRM report – LKPLS
 - Bioversity TF baseline report
 - CIAT-TSBF baseline report
 - Lake Kivu PLS Baseline study: Socio-economic baseline study, 2009
 - Lake-Kivu PLS Economic baseline survey report, 2010
 - KKM Sudan Savannah TF biophysical baseline report
 - Market survey baseline report – LKPLS
 - NGS socio-economic baseline report

SOFECSA socio-economic baseline survey
 Sudan Savannah socio-economics baseline report
 Sudan Savannah policy baseline report
 SSA-CP Villages in ZMM
 KKM NGS Site and village selection processes update
 Lake Kivu Selection of sites and villages procedures update
 Lake Kivu Pilot Learning Site, Linking Farmers to Markets: A Practical Guide, 2010.
 ZMM Sites and village selection procedure update
 Interim Proof of Concept of Integrated Agricultural Research for Development (IAR4D): East and Central Africa

4. IP Summaries

Draft summaries of 12 IPs of the KKM PLS of the SSA-CP
 Draft summary of Outputs/ to date at Barue IP, Mozambique, ZMM PLS
 Draft summary outputs of the 12 LKPLS IPs in the three countries (Uganda, Rwanda and DRC as at August 2010
 ZMM PLS IP summaries

5. Progress reports

KKM-PLS 2008 Quarterly technical reports (2)
 KKM-PLS 2008 Final report
 KKM-PLS 2009 Fourth quarterly report
 KKM PLS, NGS TF 2008 Annual implementation report
 KKM PLS, NGS TF 2009 Quarterly technical report
 KKM Sahel Agroecological Zone TF Quarterly report 2008
 KKM Sahel Agroecological Zone TF Annual report 2008
 KKM Sahel technical report 2009
 KKM Sudan Savanna Taskforce Report 2008
 KKM Sudan Savanna Taskforce Progress Reports 2009 (2)
 Lake-Kivu Technical Report 2008
 Lake-Kivu Technical Report 2009
 Lake-Kivu Technical Report 2010

6. Working papers, proceedings and articles

SSA-CP Vegetable Task Force Report: Rural Household Income Determinants: The case of IAR4D Project Sites in Mozambique and Malawi (draft)
 SSA-CP Vegetable Task Force Report: Adoption of Productivity Enhancing, Soil and Water Conservation Techniques and Land Enhancing Technologies: The case of IAR4D Project Sites in Mozambique and Malawi (draft)
 IAR4D. From Concept to Practice (Vegetable TF- ZMM PLS)
 Assessment of nutrition and morbidity of children with their mothers in IAR4D and Counterfactual villages in Malawi (draft)
 Structure of social networks among agriculture stakeholders in selected sites of Malawi and Mozambique: *Implications for information flow*
 Building a new approach for agricultural innovation systems: An ex-ante impact evaluation of IAR4D innovation platforms (IPs) operationalization on the potential adoption of improved cereal-legume crops in the Sudan Savannah zone of Nigeria (draft)
 Ex-ante Food (in) Security impact of Integrated Agricultural Research for Development (IAR4D) in Kano-Katsina-Maradi Pilot Learning Site (KKM PLS): Evidence from the Sudan Savannah zone of Nigeria (draft)
 IAR4D Network Peer Assessment Index (NPAI)
 Profitability of Rice Production in Dandume LGA of Katsina State, Nigeria
 Informed Site Specific Fertilizer Recommendation for Upland Rice Production in Northern Guinea Savanna of Nigeria

Soil Moisture Stress Mitigation for Sustainable Upland Rice Production in the Northern Guinea Savannah of Nigeria

On farm weed management in upland rice in three villages of Katsina State of Nigeria (*African Crop Science Conference Proceedings, Vol. 9. pp. 625 - 629*)

Strategic Narratives on the Establishment and Facilitation of Innovation Platforms in the Northern Guinea Savannah

Adoption of and farmers' exposure to soil and Water Management (SWMGT) Practices in the Sahel Savanna of West Africa: Average Treatment Effect (ATE) Estimations

An Assessment of Farm Input Demand in the Sudan Savanna of Nigeria: The Influence of the Innovation Platform Systems of the Integrated Agricultural Research for Development (IAR4D) of the (SSA CP)

Using a linear discriminant analysis approach of baseline conditions to develop household categories in the Sudan savanna (KKM PLS SSA CP), Nigeria (*Journal of Food, Agriculture & Environment 2010, 8: 805-812*)

Analysing the prospect of the "IAR4D's innovation platforms" in improving the productive efficiencies of cereal-legume farmers in the Sudan Savanna of Nigeria. (*Journal of Food, Agriculture & Environment 2010, 8: 813-820*)

7. Management and Finance documents²⁶

SSA-CP Organogram

FARA Annual Audited Financial Statements for 2005 through 2008

Annual Audit Findings reports for 2007 and 2008

Internal audit reports for 2009 and 2010

Unaudited Financial Statements for 2009

SSA CP Audited Statement of Expenditure (SoE) for 2007 and 2008

FARA Operations Manual Version 1.1 of April 2010 (DRAFT)

Financial and Accounting Guidelines and Controls for FARA Revised and Approved by the Board in March 2008

Minutes of the Executive Board and its sub-Committees, especially the Program and Finance and Audit sub-committees, from 2005 through 2010

Annual power point presentations by SSA-CP to the FARA Executive Board and its Program sub-Committee

A series of Review Reports, including:

The annual CGIAR Internal Auditing Unit Review of the FARA Financial Statements

2007 FARA's internal review of transaction costs during the research phase (submitted to the Executive Committee of the Board)

BTOR visit to the FARA with Robert deGraft-Hanson in December 2008

The Richard Moreton Report on Review of Governance Structures of FARA for the Department for International Development

The Kaj Bjork's Review of FARA's Financial Management and Finance Manual.

FARA Management Review by CGIAR Systems Office in 2005

Audited Statement of Expenditure (SoE) for the European Commission for 2007, 2008, 2009 and 2010.

Quarterly Sub-Saharan African Challenge Programme Reports

Donor Agreements with FARA

FARA Agreements with Partners

8. Other

Cross-Cutting observations based on the review of three CGIAR Challenge Programs, 2008 (Markus A. Palenberg, Institute for Development Strategy)

Lessons Learnt from Selection and Implementation of the CGIAR Challenge Programs, CGIAR Science Council and the CGIAR Secretariat, 2007

²⁶ Including confidential material that was reviewed only by relevant Panel members.

Annex 5

Innovation Platform Summaries in Three Pilot Learning Sites

IP	Country	Initiation m/y	Location/ Participating villages	Entry Point	Partners	Opportunities addressed	Achievements to-date
<i>Zimbabwe, Malawi and Mozambique Pilot Learning Site</i>							
Makoni SOFECSA IP	Zimbabwe	3/2008	Makoni District, Nyahava & Bingaguru wards in Chinyika resettlement area		Local: Farmers, local Agritex extension District: CIMMYT-SOFECSA, Agritex DAEO's office, Environmental Management Agency, AgriBank, Grain Marketing Board (GMB) Regional/National: Delta Beverages, GMB, Olivine Industries, Uni. of Zimbabwe, DR&SS, Windmill Fertilizer, Seed-Co, Agricultural Research Council, AGRITEX	Improved yields and production of maize, cowpea and groundnuts; collective crop marketing and timely acquisition of crop inputs; increased uptake of ISFM technologies	IP established and operationalised at national, district (hub) and ward (community) levels. Establishment of field-based learning centres as rallying points for interaction of IP actors. Farmers establishing market links with Delta Beverages (in Marondera town) and collectively delivering maize, Farmers successfully acquiring fertilizers from Windmill in Harare and GMB.
Wedza SOFECSA IP	Zimbabwe	3/2008	Wedza District, Dendenyore & Goto wards of Wedza Communal Area		Local: Farmers, local Agritex extension District: Agritex DAEO's office, AgriBank, GMB, Zimbabwe Farmers' Union, District Meteorological Office, Environmental Management Agency Regional/National: Agriseeds, Seed-Co, GMB, Olivine Industries, Uni. of Zimbabwe, DR&SS, Windmill Fertilizer, Zimbabwe Fertilizer Company, ZINASCA, ARC, AGRITEX	Improved yields and production of maize, cowpea and soyabean, cowpea seed production, and timely acquisition of crop inputs, increased uptake of ISFM technologies	IP established and operationalised at national, district (hub) and ward (community) levels. Establishment of field-based ISFM learning centres and embracing of natural resource management issues by the IP. Farmers successfully securing contracts for cowpea seed production with Agriseeds and trading cowpea grain for fertilizer and/or cash. Expanded production of legumes in farmers' fields
Zomba SOFECSA IP	Malawi	7/2008	Zomba District, in Dzaone, Malosa, Mpokwa and Likangala EPAs		Local: Farmers, DAPP Farmers Club, Extension Planning Areas (EPA) personnel District: District Agricultural Extension Office, District Assembly Officials, Zomba Agrodealer, World Vision International, CADECOM, Reform Enterprises (Agrodealer), Mr Chagoma Kirk Agro-Trading Department of Land Resources and Conservation, OIKONOMOS Foundation, Millennium villages Project Regional/National: Machinga ADD, Mulli Brothers, AGORA, Rab Processors Transglobe, Songani Likuni Phala Processors Mulli brothers, New Building Society Bank, Usiwa Watha Credit Bank	Improved productivity of maize – groundnut/soyabean rotations and maize/pigeon pea intercrops; increased income from value addition and marketing of legume grains, timely acquisition of crop inputs	IP established and operationalised at district (hub) and EPA (community) levels. Increased awareness on benefits of ISFM technologies and improved use of inputs from the government subsidy program. Establishment of field-based ISFM learning centres by the IP. Diversification into small scale irrigated phaseolus bean production for marketing communities. Identification of local markets for soyabean and phaseolus bean with local schools and health centres.
Barue SOFECSA	Mozambique	10/2008	Barue District, in <i>Chuala e</i>		Local: Provincial (CZC, SPER, Agro-dealers, NGO's, UCAMA), and district (Local	Increased productivity of maize/grain legume intercrops	IP established and operationalised at provincial and community levels.

IP			<i>Nhazónia, Honde and Nhassacara e Fudze localities</i>		Leaders, Government authority, SDAE, Farmer Associations, Agro-dealers, NGOs and farmers) District/Provincial: Dengo commercial, Dzara yapera (<i>input providers</i>); Abilio Antunes, Deca (<i>agro-processors & transporters</i>), Servicos Distritais de Actividades Economicas (SDAE), Servicos Provincial de Extensão Rurale (SPER), Uniao dos Campones de Manica (UCAMA) a farmers' association National: Instituto de Investigação Agrária de Moçambique (IIAM), Direcção Nacional de Extensão Agrária (DNEA), Univesidade Eduardo Mondlane – Faculdade de Agronomia, IFDC (agrodealer trainer)	and rotations (emphasis on cowpea, groundnut, soyabean and pigeonpea), and enhancing household food security. Enhancing access to improved seed and ISFM technologies (e.g. increased & strategic fertilization of the cereal-legume systems). Mobilization of farmers for organised production and marketing to local and national markets.	Increased awareness on benefits of ISFM technologies among farmers and service providers. Establishment of farmer learning alliances for testing improved ISFM technologies and agronomic practices through Learning Centres Increased interaction and communication among national researchers, extension and private agro-service providers.
Murehwa-CA Taskforce IP	Zimbabwe	7/2009	Murehwa District Participating villages: Bruce, Kourine, Springdale, Twin Rivers and Bango	Conservation Agriculture/ Maize, Tomato	Farmers: Core IP members (individual and farmer group representatives), village heads Private sector: Zimbabwe Farmers Union (small holder farmers association) Zimbabwe Commercial Farmers Union AGRISEEDS (input and output market) contract farming, MASHCO (seed fertiliser and pesticides) Boarding Schools (output market for tomatoes-second commodity crop) Policy makers: Environment Management Agency (NRM), GMB (input/output market) Researchers: CIAT and CIMMYT Extension: AGRITEX-extension services and coordination of District IP NGO- COMUTEC (Community Technology Development Trust) – CA extension Training institutions: Uni. of Zimbabwe, Wageningen Uni. and Research Centre Other: Mercy Kings (credit provider) and Mercy Corps; Peripheral IP partners	Improved productivity of maize and tomatoes through efficient use of water and nutrients Improved household food security as a result of increased crop production. Extra benefits to farmers through increased market linkage. Broadened experience by AGRITEX, NGOs with impact-oriented research skills using IAR4D approach for evaluating and promoting new technologies with farmers and linking them to markets. Increased awareness and understanding by policy makers of agricultural resource conservation and enabling policy options. Improved networks and collective action among IP actors. Sustainable agro-ecological intensification promoted through use of Conservation Agriculture technologies.	A functional IP has been established in the district At least 1348 farmers have been reached directly or indirectly through innovation platform's activities (27 directly as IP members and 1321 as follower farmers) Farmers have been linked to input and out put markets for the selected commodities Learning sites (step trials and demonstration plots) have been established IP actors trained on the IAR4D approach for evaluating and promoting new technologies with farmers and linking them to markets Improved livelihoods amongst conservation agriculture farmers as a result of increased crop production Community savings (<i>Mukando</i>) which offer credit to farmers have been established Stakeholder communication strategy for information sharing has been established through farmer field days, farmer exchange visits and stakeholder joint evaluation and planning. Community-based PM&E system has been established
Hwedza -CA Taskforce IP	Zimbabwe	6/2009	Hwedza District Participating villages: Nhukarume,	Conservation Agriculture/ Maize, Tomato	Farmers: Core IP members (individual and farmer group representatives, village elders) Private sector: SEEDCO (input supplier) NICO ORGO (input supplier)	Improved productivity of maize and tomatoes through efficient use of water and nutrients Improved household food	A functional IP has been established in the district At least 848 farmers have been reached directly or indirectly through innovation platform's activities (17 directly as IP members and 831 as follower

			Samundare, Wagoneka, Chidora and Nyamutsika		Zimbabwe Farmers Union, Boarding Schools Policy makers: Environment Management Agency (NRM), GMB (input/output market) District Administrators office (Policy) Researchers: CIAT and CIMMYT Extension: AGRITEX-extension services and coordination of District IP Training institutions: Uni. of Zimbabwe, Wageningen Uni. and Research Centre	security as a result of increased crop production Extra benefits to farmers through increased market linkage Broadened experience by AGRITEX, NGOs with impact-oriented research skills using IAR4D approach for evaluating and promoting new technologies with farmers and linking them to markets Increased awareness and understanding by policy makers of agricultural resource conservation and enabling policy options. Improved networks and collective action among IP actors Sustainable agro-ecological intensification promoted through use of Conservation Agriculture technologies. Improved interactions between farmers and input providers , eg Nico Orgo experimenting with farmers on their products	farmers) Farmers have been linked to input and out put markets for the selected commodities Learning sites (step trials and demonstration plots) have been established IP actors trained on the IAR4D approach for evaluating and promoting new technologies with farmers and linking them to markets Improved livelihoods amongst conservation agriculture farmers as a result of increased crop production Community savings (<i>Mukando</i>) which offer credit to farmers have been established Stakeholder communication strategy for information sharing has been established through farmer field days, farmer exchange visits and stakeholder joint evaluation and planning. Community-based PM&E system has been established
Balaka-CA Taskforce IP	Malawi	8/2009	Balaka District Participating villages: Chimkwezule, Zammimba, Njeleka, Chifodya, Ntonya	Conservation Agriculture/ Maize, Tomato	Farmers: Core IP members (individual and farmer group representatives, village elders) Private sector: ADMARC, MONSANTO and AGORA. – (Serves as both input suppliers and output market) Mulanje Peak Food Products - an output market (tomato processing company) Policy makers: District Administration Researchers: CIAT, CIMMYT, and Department of Agricultural Research and Technical Services (DARTS)- Chitedze Research Station scientists (Dept of Metrological Services and Climate Change) Extension: District Agricultural Development Office - , Farm Income Development Programme (FIDP) - Balaka district. NGOs - World Vision, LISEP, Total Land	Improved productivity of maize and tomatoes through efficient use of water and nutrients Improved household food security as a result of increased crop production Extra benefits to farmers through increased market linkage Broadened experience by DADO, NGOs farmer associations with impact-oriented research skills using IAR4D approach for evaluating and promoting new technologies with farmers and linking them to markets Increased awareness and understanding by policy makers of agricultural resource	A functional IP has been established in the district At least 1270 farmers have been reached directly or indirectly through innovation platform's activities (20 directly as IP members and 1250 as follower farmers) Farmers have been linked to input and out put markets for the selected commodities Learning sites (step trials and demonstration plots) have been established in the intervention villages. IP actors trained on the IAR4D approach for evaluating and promoting new technologies with farmers and linking them to markets Improved livelihoods amongst conservation agriculture farmers as a result of increased crop production Farmers have effectively been linked to a micro finance institutions for credit - Malawi Rural Finance Company (MRFC)

					Care, Self-Help Africa and Concern Universal NASFAM – National Smallholder Farmers Association of Malawi and Malawi Rural Finance Company (MRFC). Training institutions: Bunda Agricultural College, Uni. of Zimbabwe Others: Media- Reporters from Zodiak Broadcasting Station and TV Luntha	conservation and enabling policy options. Improved networks and collective action among IP actors Sustainable agro-ecological intensification promoted through use of Conservation Agriculture technologies.	Stakeholder communication strategy for information sharing has been established through farmer field days, farmer exchange visits and stakeholder joint evaluation and planning. Community-based PM&E system has been established
Barue IP - Ngazvisar ove	Mozambique	7/2009	Barue District Participating villages: Munene, Macakamira, Muviramite, Malomue, Nhamhizinga	Conservation Agriculture/ Maize, Beans	Farmers: Core IP members (individual and farmer group representatives, village elders) Private sector: UDACB (Farmers Association, Development assistance, Business) IAV (Agric and Veterinary Input supplier Dengo Commercial (Insumos Agricolas e Vet) (Input Supplier/output markets) SEMENTE –PERFEITA (Input Supplier) Nzara yapera-Input Supplier DECA (output market) Policy makers: District Administrator Researchers: CIAT, CIMMYT, ILAM Extension: DNEA, Barue District Training institutions: Uni. of Zimbabwe, Wageningen Uni. and Research Centre	Improved productivity of maize and Beans through efficient use of water and nutrients Improved household food security as a result of increased crop production Extra benefits to farmers through increased market linkage Broadened experience by DNEA with impact-oriented research skills using IAR4D approach for evaluating and promoting new technologies with farmers and linking them to markets Increased awareness and understanding by policy makers of agricultural resource conservation and enabling policy options. Improved networks and collective action among IP actors Sustainable agro-ecological intensification promoted through use of Conservation Agriculture technologies	A functional IP has been established in the district At least 971 farmers have been reached directly or indirectly through innovation platform's activities (17 directly as IP members and 954 as follower farmers) Farmers have diversified by selecting a second commodity crop Farmers have been linked to input and output markets for the selected commodities Learning sites (step trials and demonstration plots) have been established IP actors trained on the IAR4D approach for evaluating and promoting new technologies with farmers and linking them to markets Improved livelihoods amongst conservation agriculture farmers as a result of increased crop production Stakeholder communication strategy for information sharing has been established through farmer field days, farmer exchange visits and stakeholder joint evaluation and planning. Community-based PM&E system has been established
Thyolo Vegetable IP	Malawi	8/2009	Thyolo District, five research villages in four EPAs		Local: Farmers in five research villages represented on the IP District: District agricultural development officer, agro-dealers, microfinance, NGO, media Regional/national: AVRDC-RCA	Improved vegetable seed, improved vegetable production, improved producer-buyer linkages, diversity in vegetables, improved access to inputs and loans	IP established and accepted in District and functional , Vegetable packs developed and sold to farmers by agro dealers, new market linkages established and old ones strengthened and streamlined, policy and value chain analyses, farmers associations formed
Zomba Vegetable IP	Malawi	9/2009	Zomba District, five research villages		Local: Farmers in five research villages represented on the IP District: District agricultural development officer, agro-dealers, NGO, media Regional/national: AVRDC-RCA	Improved vegetable seed, improved vegetable production, improved producer-buyer linkages, diversity in vegetables, improved access to good quality inputs	IP established and accepted in District and functional , new market linkages established and old ones strengthened, policy and value chain analyses, formation of farmers' associations underway

Milange Vegetable IP	Mozambique	10/2009	Milange District, five research villages, Zambesia Province		Local: Farmers in five research villages District: District agricultural officers, agro-dealers, NGO, media, Nutrition and health staff, buyers Regional/national: AVRDC-RCA, IIAM	Improved vegetable seed, improved vegetable production, improved producer-buyer linkages, diversity in vegetables, improved access to good quality inputs and loans	IP established and accepted in District and functional , new market linkages established and old ones strengthened, formation of farmers' associations underway
Barue Vegetable IP	Mozambique	7/2008	Barue District, five research villages, Manicaland Province		Local: Farmers in five research villages District: District agricultural officers, agro-dealers, NGO, media, Nutrition and health staff, buyers Regional/national: AVRDC-RCA, IIAM	Improved vegetable seed, improved vegetable production, improved producer-buyer linkages, diversity in vegetables, improved access to good quality inputs and loans	IP established and accepted in District and functional , new market linkages established and old ones strengthened, formation of farmers' associations underway, production cycles established through staggered planting
Lake-Kivu Pilot Learning Site							
Bufundi	Uganda	11/2008	Kabale District , 5 Parishes and their respective sub-parishes	Soil & Water Conservation / potato	Farmers: Core IP members (individual and farmer group representatives) Private sector: UNADA, Equity Bank, Bufundi SACCO, Transporters, Joro Investment Ltd, Kampala Potato Traders Group Policy makers: Local government (District, Sub-county, local councils II – parish and I – subparish) Researchers: NARO, Makerere, AHI, CIP, ICRISAT Extension: Kulika, NAADS Training institutions: Kyambogo, Kabale, Makerere, and Kenyatta Universities Other: ODL Network, SUCAPRI University network (Uni. of Nairobi, Egerton, Jomo Kenyatta Uni. of Agricultural Technology, Kenyatta Uni., ICRA, Commonwealth of Learning)	Improved seed potato, improved production, organized markets and improved potato sales to Kampala, collective action for soil and water conservation, improved soil fertility and yields; linked to financial credit institutions e.g. SACCO	IP established and accepted in District Formulated bylaws for ensuring effective implementation of SWC Established four subcommittees (Market, M&E, NRM and Production) Formed watershed associations/groups at parish level for joint action in trench making IP members participating in monthly meetings Market identified and IP linked (farmers signed MoU with Kampala Potato Traders Group) Some sales made through Joro Investments Ltd Access to improved planting materials (Victoria and Katchpot 1 versus local Kinigi); Participatory Varieties Selection through on farm trials Crop management skills improved IP executive and steering committees composed of women and men participating effectively in meetings Parishes each has a learning site for farmers in sub-parishes Instrumented benchmark learning watershed (stream flow meters, rain gauges, evaporation measuring equipment-Stevenson screens, 12 runoff plots) International expert seminar on IWM and climate change involving communities and Uni. of Siegen, and Makerere, Dar es Salaam and Kenyatta Universities to agree on student research topics.
Isangano	Rwanda	11/2009	Gataraga Secto,	Irish	Farmers: Core IP members (group	Clean potato seed production	IP established and accepted at the Sector level

Gataraga			Musanze District, 10 villages	potatoes	representatives) Private sector: Gataraga SACCO, Input trader Policy makers: Local authorities (Executive secretary of the sector) Researchers: ISAR, CIAT, Makerere, NUR, ISAE Extension: Urugaga Imbaraga (National Farmers Federation), public extension Other: NUR, ISAE, Wageningen Uni. Research	through positive selection, improved potato quality through harvest (dehalming) and post-harvest (washing) techniques	IP members participating in meetings Women participating effectively in meetings Women holding office positions in IPs executive and steering committees Two subcommittees (Market and M&E) 15 farmers (IP members) trained on Irish potatoes processing, hygiene and sanitation, preservation and packaging, production costing Linkage to Kigali potato niche market and regular sales to supermarkets and hotels Government of Rwanda allocated US\$357143/= for reintroducing and seed multiplication of Kinigi potato variety Potato grading, washing and packaging in woven sacks and portable bags made of banana leaves) Participatory evaluation of 2 new maize varieties versus one local variety Informal linkage to a maize miller Five demonstration plots of improved potato techniques for organic and mineral fertilization, spacing and potato varieties (4 no.) Introduction of 5 new fodder species
Chahi Ifatanyabu basa	Uganda	11/2008	Kisoro District, Three parishes and their respective sub-parishes	Potato	Farmers: Core IP members (individual and farmer group representatives) Private sector: UNADA, UNPSPA, Equity Bank, MECRECO, Transporters, Joro Investment Ltd, Kampala Potato Traders Group, HUNTEX Policy makers: Local government (District, Sub county, local councils II – parish and I – sub-parish) Researchers: NARO, Makerere, AHI, CIP, CIAT, ICRISAT, ISAR Extension: NAADS, Kulika Training institutions: Kyambogo, Kabale, Makerere, and Kenyatta Universities Other: ODL Network, SUCAPRI University network (Uni. of Nairobi, Egerton, Jomo Kenyatta Uni. of Agricultural Technology, Kenyatta Uni., ICRA, Commonwealth of Learning)	Improved potato and maize seed, improved production, organized markets and improved potato sales to Kampala, improved soil fertility and yields; diversification of rotational enterprises (maize and beans) evaluated in fertilizer trials	IP established and accepted in District Kisoro District has embraced the IP approach and intends to use it in other departments as a means of service delivery IP members participating in monthly meetings Four subcommittees (Market, M&E, NRM and Production) established Market identified and IP linked (farmers signed MoU with Kampala Potato Traders Group) Some sales made through Joro Investments Ltd Access to improved planting materials (Victoria and Katchpot 1 versus local Kinigi variety) Victoria variety selected through Participatory Varieties Selection and demand for 120 x 100kg bags of Victoria seed potato ordered Crop management skills improved IP executive and steering committees composed of women and men participating effectively in meetings Three parishes each has a learning (demonstration) site for farmers in sub-parishes Weather station installed

Bubare	Uganda	9/2009	Kabale District, 8 parishes		Farmers: Core IP members (individual and farmer group representatives) Private sector: HUNTEX, UNADA, Millers, Grain traders, Porridge makers, Muchahi SACCO, Transporters, Joro Investment LTD Policy makers: Local government (District, Sub county, local councils II – parish and I – sub-parish) Researchers: NARO, Makerere, AHI, ICRISAT Extension: NAADS Training institutions: Makerere Uni. Other: ODL Network	Every household in the sub county grows sorghum (Improved yields through use of fertilizer and planting in lines); Improved markets (organizing farmers to trade with the processor); Increasing the shelf life of sorghum and hygienically packaging to access high class supermarkets)	IP established, work plans and budgets integrated into local government action plans Market development using packaging and branding malted sorghum porridge ‘Mamera’ IP members participating in monthly meetings Sorghum business plans developed The IP farmers have written proposals to government programs to access funding for sorghum bulking, acquiring a bulking facility and fertilizers The IP has applied for a loan from the SACCO where one of the members is a chairperson Agreement on shared dividends between processor and producers Some sales of porridge sorghum ‘Mamera’, in incubation stage sold in supermarkets, through Joro Investments Ltd and partner organizations to the tune of US\$1200.00 per month Access to improved highland sorghum varieties (HLSO3/016, HLSO3/017, HLSO3/019, HLSO3/023, HLSO3/025, HLSO3/056 and vs most adapted local variety-Kyatanombe Participatory Variety Evaluation (HLSO3/017> HLSO3/023>HLSO3/025>Kyatanombe) based on yields Crop management skills improved IP executive and steering committees composed of women and men participating effectively in meetings Learning site (demonstrations) for farmers in each of the five parishes
Ntungamo	Uganda	9/2009	Ntungamo District, 5 participating sub-counties	Organic Pineapple	Farmers: Core IP members (individual and farmer group representatives) Private sector: NOGAMU, Fruits of the Nile (FON) Policy makers: Local government (District, Sub county, local councils II – parish and I – sub-parish) Researchers: NARO-MBAZARDI, Makerere, AHI Extension: NAADS Training institutions: Makerere Uni. Other: Africare, ODL Network	Built capacity for organic certification and inspection to target market demand to the tune of US\$200,000.00 per month, bulking and multiplication of planting materials	District of Ntungamo has embraced IAR4D approach using a hierarchical arrangement for its development initiatives starting with organic pineapples IP established with monthly meetings chaired by DAO and IP members participating representing 5 sub-counties Business plans developed Nursery demos for Smooth Cayenne pineapple variety established in 4 parishes Crop management skills improved (mulching for SWC, planting in lines) IP committees composed of women and men

							participating effectively in meetings; Market negotiations between IP members and FON ongoing Capacity built in fruit drying-solar, juice extraction from pineapple fruit (100 litres per week) Capacity building for farmers in organic farming (training and exposure visits)Capacity building for 4 organic inspectors
Huguka Mudende	Rwanda	7/2009	Mudende Sector, Rubavu District, 5 participating villages	Milk and Irish potatoes	Farmers: Core IP members (farmer group representatives) Private sector: udendeSACCO, RDB (Rwanda development bank), Inyange Industries Policy makers: Local authorities (Executive secretary of the sector) Researchers: ISAR, CIAT, Makerere, ISAE, NUR Extension: Urugaga Imbaraga (National Farmers Federation), public sector extension Training institutions: NUR, ISAE	Improved milk quality through establishment of milk cooling system, clean potato seed production through positive selection	IP established and accepted at the Sector level IP members participating in meetings Women participating effectively in meetings Women holding office positions in IP's executive and steering committees 17 farmers trained on hygienic milk production, milk handling and transportation Participatory evaluation of 2 new maize varieties versus one local variety Two demonstration plots of improved potato techniques for organic and mineral fertilization, spacing and potato varieties (4 no.) Introduction of 4 new fodder species Construction of milk cooling system building
Dufatanye Remera	Rwanda	9/2009	Remera Sector, Musanze District, 5 participating villages	Common and snap beans, and passion fruits	Farmers: Core IP members Private sector: Urwibotso Enterprises Policy makers: Local authorities (executive secretary of the sector) Researchers: ISAR, CIAT, ISAE Extension: Urugaga Imbaraga (National Farmers Federation), public sector extension, Urwibotso Enterprises Training institutions: NUR, ISAE	Improved soil conservation and fertility through planting of fodder species on terrace slopes and manure; improved human nutrition due to increased cow ownership, milk yield and production	IP established and accepted at the Sector level IP members participating in meetings Women participating effectively in meetings Women holding office positions in IP's executive and steering committees Introduction of a high value crop (snap beans and passion fruit) Introduction of four fodder species 500kgs of two improved bean varieties distributed for multiplication 600 seedlings of passion fruit distributed Introduction of one snap bean variety (1214/2/2)
Gerakunte go Rwerere	Rwanda	9/2009	Rwerere Sector, Burera District, 5 participating villages	Chilli and milk	Farmers: Core IP members Private sector: Banque populaire du Rwanda, Urwibotso enterprises Policy makers: Local authorities (chairmen of villages) Researchers: ISAR, CIAT, Makerere, ICRISAT Extension: Urugaga Imbaraga (National Farmers Federation), public extension, ANS (Action Nord-Sud, SACR (Send a Cow	Improved soil conservation and fertility through planting of fodder species on terrace slopes and manure; Improved nutrition due to increased cow ownership, milk yield and production	IP established and accepted at the Sector level IP members participating in meetings Women participating effectively in meetings Women holding office positions in IP's executive and steering committees IP problems of nutrition, incomes and soil fertility addressed by aligning activities with government policy of one cow one family and zero grazing through signing of contracts between farmers and cow providers, facilitated by local government

					Rwanda) Training institutions: NUR, ISAE, Wageningen Uni. Research		Benchmark learning watershed instrumented – automatic weather station Capacity building at PhD level (one) Introduction of a high value crop (chilli) Introduction of four fodder species 25 farmers in the IP have received improved cow breeds 20 farmers trained on hygienic milk production, milk handling and transportation Established three chilli nursery beds Linkage to chilli market (Urwibutso enterprise)
Buuma	DRC	10/2009	Masisi District, Mpfuni Shanga groupement (sub-county), Kituva location, 4 antennae (collection of several villages)	Cassava	Farmers: Core IP members (individual and farmer groups representatives) Private sector: MECRECO, ProNAPLICAN Policy makers: Chef de village; chef de localite, chef de police Researchers INERA, CIAT-TSBF, OVG, Makerere, ICIPE, ICRISAT Extension: GAP-Pharmakina, public service agronomist, DIOBASS, SYDIP Training institutions: Kiroche Primary and secondary schools Other: Faith based Organization (for meeting venues and information flow)	Improved mosaic disease tolerant varieties, improved production, post harvest handling technologies, improved crop management; soil fertility and market identification, firewood, clean air, water, microenvironment, incomes from timber	IP established and accepted in District IP members participating in meetings Setting up of four commissions (Market, M&E, Credit and Production) learning sites established access to improved planting materials crop management skills improved household gender relations-men have joined their spouses in growing the improved disease resistant varieties women participating effectively in meetings women holding office positions in IPs executive and steering committees Two tree nurseries with 35,000 seedlings each demo field with 3 improved mosaic tolerant cassava varieties from INERA Two selected through Participatory Varieties Selection and adopted in their farms each village has a cassava seed multiplication field 40 champion farmers ten in each of the 4 antennae used as learning sites for other farmers and for seed multiplication instrumented benchmark, learning watershed (stream flow meters, rain gauges, evaporation measuring equipment, 12 runoff plots) market identification (trader survey) capacity building in market identification, Monitoring and evaluation, erosion control and fertility, production techniques. Capacity Building in Ph.D. in innovation systems
Maendeleo	DRC	10/2009	Rutshuru District, Groupement	Beans	Farmers: Core IP members (individual and farmer groups representatives) Policy makers: Chef de village	Improved bean seed, improved production, improved sales through group marketing and	IP established and accepted in District IP members participating in meetings Setting up 4 commissions (Market, M&E, Credit

			(Sub-county) Kisigari, Rubare localisation, 6 antennae		Researchers INERA, CIAT-TSBF, OVG, ICIPE Extension: GAP-Pharmakina, public service agronomist, DIOBASS, SYDP Training institutions: Iowa State Uni. Other: Faith based Organization (for meeting venues and information flow)	being linked to a better market; access to credit, improved crop management, Soil fertility, firewood, clean air, water	and Production) learning sites established, some sales made through collective marketing to traders in Kinshasa, Goma and Bukavu Identification of the bean variety needed by the market (4 accepted out of 7); Accessed credit from MECRECO for purchase of improved seeds (for the second time after reimbursing of the first one) Two tree nurseries with 35000 and 20000 seedlings established 84 farmers seed multiplication fields (each 64m ²) established and harvested 4 demo fields for 8 types of beans, 4 varieties adopted through participatory variety selection process motivated by market driven selection Farmers and traders organised for enhanced group marketing Informal market negotiations between traders and producers facilitated Improved production Post harvest handling improved (sorting and grading) Capacity building in PhD. in innovation systems Capacity building in market identification, M&E, post harvest handling
Musanganya	DRC	12/2008	Masisi District, Mpfuni Shanga, Bweremana location, 5 antennae	Banana	Farmers: Core IP members (individual and farmer groups) Private sector: MECRECO, ProNAPLICAN Policy makers: Chef du village, chef de localite, chef de groupement, King Researchers INERA, CIAT-TSBF, OVG, Makerere, CIALCA, ICIPE Extension: GAP-Pharmakina, DIOBASS, SYDIP, public agronomist Other: ACF, Faith based Organization	Soil erosion and soil fertility improved production post harvest handling improved crop management management of banana wilt disease Organised exposure visits of farmers to Bukavu markets and traders to Musanganya for informal market negotiations value addition – processing and packaging of banana wine (<i>Kasiksi</i>) and juice (<i>Mutobe</i>) Firewood, clean air, water, microenvironment, incomes from timber	IP established and accepted in District IP members participating in meetings Four commissions established skills in managing micro-propagation units for clean banana planting materials access to improved planting materials crop management skills improved household gender relations - men have joined their spouses in growing the improved disease resistant varieties; women are participating in meetings and also holding offices in the IP capacity building in market identification, transformation, packaging, propagation for clean planting material Two tree nurseries of 20000 seedlings each
Muungano		1/2009	Rushuru District, Kisigari Groupement,	Irish potato	Farmers: Farmers in five antennae Private sector: MECRECO, Urwibutso Enterprises	Improved potatoes seed improved production post harvest handling	IP established and accepted in District, IP members participating in meetings, 4 commissions (Production, Market, Credit and

			Rumangabo location, 5 antennae		Policy makers: Chef de Groupement, Admistrateur resident Researchers INERA, CIAT-TSBF, OVG, ISAR Extension: GAP-Pharmakina, DIOBASS, SYDIP Other: Faith based Organization	access to credit improved crop management soil fertility and management of diseases Market survey Link between growers and traders Firewood, clean air, water, microenvironment, incomes from timber market preferred Rwanda passion fruits introduced by Urwibutso Enterprises access to market	M&E) established Four learning sites (demos) established, access to credit for purchase of improved seeds and other inputs; training on harvesting and storage of potatoes in order to fetch a better market One tree nursery of 35000 seedlings including fruit trees established capacity building in market identification, M&E, harvesting techniques, storage, selection production increased
Kano-Katsina-Madari Pilot Learning Site							
Rice IP	Nigeria	11/2008			Local: Individual farmers and farmer groups in targeted villages Local govt Area level Dandume Local Government Chairman; apex farmers' organization represented at IP management committee level, Dandume Local Government Agric Service Regional/national: NAERLS/ABU, IAR/ABU, CEC/UAM, Agric Engineering/ABU, NCRI, Agric Commissioners of Katsina State Government, KTARDA and FiF (NGO); Premier seed Ltd, Maslaha Seed, Golden fertilizer Ltd, NOTORE Chemical, Goldagric. International: IFDC, ICRA	Intensified (upland & lowland) rice production and value addition to meet an increasing rice demand in the market. Improved uplands and lowlands (Fadama) productivity for rice and developed innovative rice farming practices in a multi-actors setting processes. Integrated innovation scaled out towards improved many rice farmers incomes in Dandume Local Government Area	IP established and functioned since 2008 and ground rules set up for its functioning IP management committee (consisted of representatives of different categories of IP actors) set up Participatory fertilizer recommendation done with farmers in targeted villages Different rice production practices (varieties, planting methods, weed management, soil and water conservation methods) are evaluated with farmers Integration of the best weed management practices, the best rice varieties, the best rice planting method by introducing drill marker and the optimal fertilizer rates to develop an intensive rice production option. Rice value chain analysis and rice inputs and output market studies conducted to identify challenges to support the intensification of rice production by farmers. The facilitation of access to improved planting materials and genuine inputs (seeds, fertilizer, herbicides) successfully organized. The current agricultural policy situation regarding rice production in Dandume Local Government Area is analyzed and key areas for advocacy identified with key stakeholders (e.g. Local Government). The scaling – out of the rice production option

							achieved and activities moved from 5 pilot villages to all the 11 villages under the support of the Local Government. The ownership of the rice IP is being achieved, the Local Government of the Dandume has started supporting the rice IP (investment in inputs and agricultural machinery)
Maize – legumes	Nigeria	11/2008	Ikara Local Government Area, participating villages Kargo, Bakula, Barangwaje, Jafallan and Rafin Tabo		Local: Individual and farmer groups in targeting villages Local govt Area level Ikara Local Government Chairman; apex farmers' organization represented at IP management committee level, Ikara Local Government Agric Service Regional/national: KADP, IAR/ABU, NAERLS/ABU, CEC/UAM and FiF (NGO), Premier seed Ltd, Maslaha Seed, Golden fertilizer Ltd, NOTORE Chemical, Jubaili chemical, Agric Commissioners of Kaduna State Government, All Farmers Association of Nigeria (AFAN) Kaduna State Branch. International: IFDC, ICRA, TSBF-CIAT	Improved land productivity by the IP platform driving processes to combat severe soil fertility decline and striga infestation in the maize legume production system. Integrated innovations developed in maize-soybean and maize-cowpea cropping system to achieve simultaneously several objectives (Intensified production, improved soil fertility for maize and legumes and combat striga). Established farmers' organization and private sector arrangement to conclude deals in the inputs and output markets. Negotiated institutional arrangements with the farmers' organization to scale-out developed technological option from 5 pilot villages to 30 villages in Ikara Local Government Area	IP established and functioned effectively since 2008 and ground rules set up for its functioning IP management committee (consisted of representatives of different categories of IP actors) set up Participatory fertilizer recommendation for maize done with farmers in targeted villages Different maize production practices (striga tolerant maize varieties trials, soil and water conservation methods for maize cultivation) are evaluated with farmers Different P-sources for soybean and cowpea are evaluated with farmers Different maize-legumes technological options developed with farmers by combining best practices for maize, soybean and cowpea production: (i) Double cowpea – maize production system; (ii) Maize – soybean strip cropping; (iii) Maize – cowpea intercropped; and (iv) Maize striga tolerant, etc. Maize, soybean, cowpea value chain analysis and Maize, soybean, cowpea inputs and output market studies conducted to identify challenges to support the intensification of Maize – Cowpea and maize – soybean production by farmers. The facilitation of access to improved planting materials at Premier Seeds LTD and to genuine fertilizer and herbicides successfully organized respectively with Golden Fertilizers and Jubaili. These actions resulted into direct farmers' deals with the private sector. The current agricultural policy situation regarding maize, cowpea and soybean production in Ikara Local Government Area is analyzed and key areas for advocacy identified with key decision – making stakeholders (e.g. Local Government). The scaling – out of the maize – soybean and maize

							– cowpea production options achieved and activities moved from 5 pilot villages to all the 30 villages under a negotiated arrangement with farmers' organization, extension organization (KADP) and the support of the Local Government through its Agric. extension service The ownership of the Maize – legume by the apex farmers' organization is being achieved and the Local Government has expressed interest to support financially the Maize – legumes IP (beyond the provision of agric service)
Vegetable IP	Nigeria	11/2008	Kudan Local Government Area		Local: Individual and farmer groups in targeting villages Local govt Area level: Kudan Local Government Chairman; apex farmers' organization represented at IP management committee level, Kudan Local Government Agric Service. Regional/national: KADP, IAR/ABU, NAERLS/ABU, CEC/UAM and FiF (NGO), Premier seed Ltd, Maslaha Seed, Golden fertilizer Ltd, NOTORE Chemical, Jubaili chemical, Green Peters, Agric Commissioners of Kaduna State Government, All Farmers Association of Nigeria (AFAN) Kaduna State Branch International: IFDC, ICRA, AVCRD	Beyond the improvement of land productivity, efficient use of water during the off-season activities and pest management during the rainy season are the key challenges addressed by the IP towards increased farmers' incomes. Drip irrigation, efficient use of water and nutrient management by introducing Urea granules Deep Placement (UDP); established farmers' organization to towards improved bargaining power in the complex tomato marketing chain and input sector	IP established and functioned effectively since 2008 and ground rules set up for its functioning IP management committee (consisted of representatives of different categories of IP actors) set up Different tomato and pepper varieties combined with growth enhancer evaluated with farmers during the off-season and the rainy season periods Efficient water use and nutrient management practices under drip irrigation system developed with farmers the five targeted villages Different pest management practices evaluated with farmers during off-season period and rainy season period to increase the incomes of farmers. Tomato value chain analysis and Tomato inputs and output market studies conducted to identify challenges to improve the margin of tomato growers in a complex and multi-actors marketing chain. The facilitation of access to dealers of the drip irrigation kit and other machinery like water pump at a subsidized price at the level of the Kaduna State extension service (KADP). The current agricultural policy situation regarding tomato production in Kudan Local Government Area is analyzed and key areas for advocacy identified with key decision – making stakeholders (e.g. Local Government). The scaling – out of improved tomato production options was done activities moved from 5 pilot villages to all the 25 villages under a negotiated arrangement with farmers' organization, extension organization (KADP) and the support of the Local Government through its Agric. extension service

Livestock	Nigeria	11/2008	Kubau Local Government Area		Local: Individual and farmer groups in targeting villages Local Govt Area level: Kubau Local Government Chairman; apex farmers' organization represented at IP management committee level, Kubau Local Government Agric Service. Regional/national: National Animal Production Research Institute (NAPRI), Dept. of Animal Science/ ABU, IAR/ABU, KADP, Kubau Local Government Agric Service, Mercy Holdings Nig. Ltd; Feed Master; Rebson Nig. Ltd, Association of Livestock Feed Sellers; All Farmers Association of Nigeria (AFAN) Kaduna state Branch International: ILRI, IFDC, ICRA	Improved capacity of livestock smallholders on small ruminants (sheep and goat) production systems to increase their incomes in a short run	IP established and functioned effectively since 2008 and ground rules set up for its functioning IP management committee (consisted of representatives of different categories of IP actors) set up Sheep and goat value chain analysis and small ruminants inputs and output market studies conducted to identify challenges to improve the margin of small ruminants keepers. On-going development of small ruminants fattening options with livestock – farmers in Kubau Local government Area The current agricultural policy situation regarding livestock production (especially goat and sheep) in Kubau Local Government Area is analyzed and key areas for advocacy identified with key decision – making stakeholders (e.g. Local Government).
Maize-legume-livestock	Nigeria	3/2008	Bunkure LGA, 10 communities		Local: Farmers groups and organisations, agro-input/output dealers Local Govt Area level: LGA Chairman and Head of Agriculture for the LGA, Kano State Agricultural Extension service (KNARDA). Regional/National: Institute of Agricultural Research/Ahmadu Bello Uni., NAPRI, Bayero Uni., Kano, IITA, ILRI, Project Seed company, Kano, Jubaili Agrotec Co., Grand Cereals company ltd., NGOS	Improved maize, sorghum and legume production systems, Improved seed systems, soil fertility and parasitic weed management, improved livestock nutrition, improved market and improved support from government	IP areas and commodity focus agreed, workshops held to agree on activities and roles, IPS launched, experiments/demonstrations established to show case technologies that would address production technologies, policy makers sensitized to support agriculture, IP's meetings held periodically to resolve emerging issues, market linkages established. Capacity building of IP actors in progress
Sorghum-legume-livestock	Nigeria	3/2008	Shanono LGA, Kano State, 10 communities		Local: Farmers groups and organisations, agro-input/output dealers Local Govt Area level: LGA Chairman and Head of Agriculture for the LGA, Kano State Agricultural Extension Service (KNARDA). Regional/National: Institute of Agricultural Research/Ahmadu Bello Uni., NAPRI, Bayero Uni., Kano, IITA, ILRI, Project Seed company, Kano, Jubaili Agrotec Co., Grand Cereals Company Ltd., NGOs	Improved sorghum, maize and legume production systems, Improved seed systems, soil fertility and parasitic weed management, improved livestock nutrition, improved market and improved support from government	IP areas and commodity focus agreed, workshops held to agree on activities and roles, IPS launched, experiments/demonstrations established to show case technologies that would address production technologies, policy makers sensitized to support agriculture, IP's meetings held periodically to resolve emerging issues, market linkages established. Capacity building of IP actors in progress
Maize-legume-livestock	Nigeria	3/2008	Musawa LGA, Katsina State, 11 communities		Local: Farmers groups and organisations, agro-input/output dealers Local Govt Area level: LGA Chairman and Head of Agriculture for the LGA, Katsina State Agricultural Extension service (KTARDA). Regional/National: Institute of Agricultural	Improved maize, sorghum and legume production systems, Improved seed systems, soil fertility and parasitic weed management, improved livestock nutrition, improved market and improved support	IP areas and commodity focus agreed, workshops held to agree on activities and roles, IPS launched, experiments/demonstrations established to show case technologies that would address production technologies, policy makers sensitized to support agriculture, IP's meetings held periodically to resolve emerging issues, market linkages established.

					Research/Ahmadu Bello Uni., NAPRI, Bayero Uni., Kano, IITA, ILRI, Project Seed company, Kano, Jubaili Agrotec Co., Grand Cereals Company Ltd., NGOs	from government	Capacity building of IP actors in progress
Sorghum - legume-livestock	Nigeria	3/2008	Safana LGA, Katsina State, 10 communities		Local: Farmers groups and organisations, agro-input/output dealers Local Govt Area level: LGA Chairman and Head of Agriculture for the LGA, Katsina State Agricultural Extension service (KTARDA). Regional/National: Institute of Agricultural Research/Ahmadu Bello Uni., NAPRI, Bayero Uni., Kano, IITA, ILRI, Project Seed company, Kano, Jubaili Agrotec Co., Grand Cereals Company Ltd., NGOs	Improved maize and legume production systems, Improved seed systems, soil fertility and parasitic weed management, improved livestock nutrition, improved market and improved support from government	IP areas and commodity focus agreed, workshops held to agree on activities and roles, IPS launched, experiments/demonstrations established to show case technologies that would address production technologies, policy makers sensitized to support agriculture, IPs meetings held periodically to resolve emerging issues, market linkages established. Capacity building of IP actors in progress
Groundnut value chain	Niger	12/2008	Madarounfa, Badaria, Dan Hajara, Gade, Garin Walli, Katatouma	Production constraints due to groundnut rosette disease, soil fertility, quality seed availability, groundnut	Farmers: Individual and farmer organization in targeting villages, represented at IP management committee level Private sector: Initially Olga Oil, but no longer due to insufficient production level, UNIFAM for equipments, inputs dealers, groundnut processors, seed producers, product traders, public input stores Policy makers: Préfet Madarounfa, Maires communes rurales, (Safo et Gabi), traditional leaders) Researchers: INRAN, ICRISAT (TL2 M B Gate Foundation) Extension: Directions Régionale et Départementale de l'Agriculture, Maradi, Madarounfa and district extension agents Micro financing institutions: Kokari and ASUSU for warrantage and credit for inputs purchase Other: FUMA Gaskiya for scaling up activities and capacity building of FOs on production and marketing	Capacity building of farmers on the necessity to monitor and control groundnut rosette disease, availability of quality seeds produced in the five villages, and efficient use of phosphorus fertilizer. Access to credit and warrantage	IP established and functioned since 2008 and ground rules set up for its functioning IP steering committee consisted of representatives of different categories of IP actors) set up Capacity building of FOs to improve group dynamics and bargaining power Farmer organizations registered with legal documents Training on groundnut rosette disease monitoring and control with botanical and conventional pesticides done with farmers in targeted villages Integrated groundnut production practices (good quality seed treated with fungicide, planting methods with planter, weed management, efficient use of P fertilizer) are evaluated with farmers The scaling – out of the groundnut production option achieved and activities touched a higher number of farmers with the collaboration of ASUSU for credit and FUMA Gaskiya and HIMMA for capacity building of farmers and FOs with new members coming from neighbouring villages
ISFM in the cereal/legume systems	Niger	12/2008	Département Guidan, Roundji, Fagagaou, Karanguiya, Karoussa,	Soil fertility, Pearl millet, sorghum, and Cowpea	Farmers: Individual and farmer organization in targeting villages, represented at IP management committee level Private sector: Inputs dealers, groundnut processors, seed producers, product traders,	Improved land productivity by the IP platform driving processes to combat severe soil fertility decline in millet/cowpea production system. Integrated innovations (land preparation,	IP established and functioned effectively since 2008 and ground rules set up for its functioning IP steering committee consisted of representatives of different categories of IP actors set up Capacity building of FOs to improve group dynamics and bargaining power

			Koringo, and Sae Tsouni		public input stores Policy makers: Préfet Guidan Roumdji, Maires communes rurales, (Tibiri, Chadakori et Sae Saboua), traditional leaders Researchers: INRAN, TSBF/Afnet Extension: Directions Régionale et Départementale de l'Agriculture, Maradi, Guidan Roumdji, Forestry department Guidan Roumdji, and district extension agents Micro financing institutions: ASUSU for warrantage and credit for inputs purchase Other: Fédération SA'A for scaling up activities and capacity building of FOs on production and marketing	improved varieties, efficient use of fertilizer, plant population density) developed in millet/cowpea and sorghum cropping systems to achieve simultaneously several objectives (intensified production, improved soil fertility for millet, sorghum and cowpea, and improve incomes). Established farmers' organization and private sector arrangement to conclude deals in the inputs and output markets. Access to credit from a micro financing institution to buy inputs with possibility of warrantage Agreement with Fédération SA'A to scale-out developed technological option from 5 pilot villages to others neighbouring villages	Farmers' organisations registered with legal documents Farmer's organisation linked to a micro financing institution Options of ISFM that include new improved varieties selection, land preparation of water conservation, plant population density and efficient use of fertilizer, tested and validated on sole crops and pearl millet/cowpea strip cropping. Improved pruning of shrubs and trees as option for soil erosion reduction, soil fertility and production increased tested and validated
Vegetable IP	Niger	12/2008	Département Aguié, 5 participating villages: Assaya, Birnin Kouka, Gollom, Gourjia and Jan Kouki	Management practices, disease (nematode) and pests; Green pepper, rainy season tomato, onion and cabbage	Farmers: Individual and farmer organization in targeting villages, represented at IP management committee level Private sector: Inputs dealers, vegetables traders from Maradi and Nigeria, seed producers, public input stores Policy makers: Préfet Aguié, Chef de Poste Administratif de Gazaoua, Maires communes rurales, (Gazaoua et Gangara) traditional leaders Researchers: INRAN Extension: Directions Régionale et Départementale de l'Agriculture, Maradi, Aguié, PPILDA/IFAD, and district extension agents Micro financing institutions: ASUSU for warrantage and credit for inputs purchase Other: ONG Taimakon Manoma for scaling up activities and capacity building of FOs on	Capacity building of farmers on green pepper integrated management practices and integrated disease (nematode) management (production of botanic extracts and diversification of products) Production tomato during the rainy season to satisfy demand Linking producers to vegetables traders in Maradi	IP established and functioned effectively since 2008 and ground rules set up for its functioning IP steering committee consisted of representatives of different categories of IP actors set up Capacity building of FOs to improve group dynamics and bargaining power Farmers' organisations registered with legal documents Options of integrated production practices (good quality seeds, plant population density, and efficient fertilizer use) tested and validated for green pepper. IP management committee (consisted of representatives of different categories of IP actors) set up Different tomato varieties evaluated with farmers during the rainy season periods Efficient fertilizer management practices developed with farmers the five targeted villages Different disease (nematodes) and pest management practices evaluated with farmers during off-season

					production and marketing		period to increase production and the incomes of farmers. The scaling – out of improved green pepper and tomato production options with the collaboration of Taimakon Manoma NGO
Livestock	Nigeria	1/2009	Zangon Daura LGA; 5 villages: Dargage, Fanteka, Gurdo, Ishiyawa, and Kututute	Feeds and livestock health care; Sheep and goat	Farmers: Individual and farmer organization in targeting villages, represented at IP management committee level Private sector: Local feed and veterinary products dealers Policy makers: Zangon Daura Local government, traditional rulers (Hakimi, Dakati and village chiefs) Researchers: ILRI, INRAN, Dept. of Animal Science/ ABU, ICRISAT Extension: KATARDA, Zangon Daura Local Government Agric Service Other: Local NGO	Improved capacity of livestock smallholders on small ruminants (sheep and goat) production systems to increase their incomes in a short run	IP established and functioned effectively since 2009 and ground rules set up for its functioning IP steering committee consisted of representatives of different categories of IP actors set up Feed availability and cost survey Feed options for ram fattening tested and validated Feed options for buck goats fattening tested and validated Ongoing dual purpose pearl millet trials with ICRISAT breeding program Efficient use of crop residues as feed with the use of cereal stalk choppers In 2010, the workplan of the INRAN/ILRI agreement planned to conduct the activities with neighboring communities and an increase on the number of participating farmers. In each of the five initial communities, three FOs (youth, adults and women) created in each village with the help from KTARDA (cooperative and credit divisions)

Annex 6

Record of Visits to two IP Sites

MAIZE IN ZIMBABWE

Zimbabwe has gone through a period of political turmoil and economic hardship. Since about 2 years this situation has improved quite significantly. At the political level a form of compromise has been reached between the main political parties and the introduction of the US dollar as the currency in Zimbabwe has stopped the hyperinflation that plagued the country.

After independence the government of Zimbabwe placed a lot of emphasis on health care, education and rural development. As a result, literacy rates were very high, health care was general good and there was a well-functioning Department of Agriculture & Technical Services (AGRITEX), there were agricultural credit facilities (AgriBank), fertilizer and seed were available at subsidized rates, and grain would be purchased by the Zimbabwean Grain Marketing Board (GMB). All of these facilities sort of collapsed during the period of economic hardship, but with the economic upswing they recovered remarkably quickly.

On Monday 13 September 2010 we visited SOFECSA Site number 1: Makoni, where SOFECSA = CIMMYT Soil Fertility Consortium for Southern Africa. The community (village) we visited is located in the Chinyika resettlement area in the Makoni District in eastern Zimbabwe, a fairly remote area close to the border with Mozambique. The area was resettled during the 1980s, when new farmers were allocated 5 hectares of land each with access to communal grazing.

Land is sloping and soils are light-textured with inherent low soil fertility. There is no groundwater available at shallow depths. Rainfall in the area is quite high (>1000 mm per year), but water holding capacity of the soils is quite low. Farmers were largely subsistence farmers growing maize and some legume crops for their own consumption. Farmers keep poultry and small ruminants. Maize yields would typically be 1 t/ha, farmers used no inputs and had little or no interaction with the market. Food insecurity and a declining natural resource base were among the problems faced by farmers.

Through the IP, which became operational in the 2008/09 growing season, a maize-legume (cowpea, groundnut) system was introduced and improved maize seed and fertilizer (7-14-7) were supplied free of charge by an NGO. Fertilizers could also be purchased from private sector suppliers or purchased from the government run GMB. The GMB would also provide the farmers with credit, if required.

Maize yield increased to about 4 t/ha. For 1 ton of grain the farmers would receive about 10 bags of fertilizer (at subsidized rates) through the GMB. Ten bags of fertilizer (= about 500 kg) would be sufficient for 2 hectares of maize. Transport costs of the maize to the GMB and the fertilizer to the village would cost approximately the equivalent of 1 ton of maize. So for 2 hectares, the farmers would have 2 tons of maize in the previous season and about 8 tons in the present season. That is, an additional 6 tons. The additional cost to the farmer would be equivalent to about 2 tons, so the profit would be 4 tons of maize, or 2 tons per hectare. Hence, for 5 hectares this would be a maximum of 10 tons. Farmers fallowed some of their land and grew legumes on some other areas. Hence the additional maize yield would be of the order of 4-6 tons (i.e., 2-3 hectares under maize). The GMB would pay 250 US\$ per ton, the private companies would pay about 180 US\$ per ton. Obviously the farmers would prefer the GMB prices, but the GMB was not yet well-resourced and did not always have the money available when the farmers needed it. Hence some farmers sold (part of) their maize to private entrepreneurs. Also, the farmers stored their maize during part of the dry season in order to sell it when the prices went up towards the end of the dry season (cf. warantage system in Niger). In all, the farmers would make a profit of the order of 720-1500 US\$. Most farmers had not seen that much money in their lives, so the degree of satisfaction with the IP system was high.

Other farmers in nearby villages did not benefit from the availability of subsidized seed and fertilizers, simply because they had never interacted with a market or did not know how they could organize transport to the GMB (output as well as input market).

The farmers in the IP village agreed that with fertilizers and seed at commercial rates, their production would also have been profitable, but less so than in the current situation. The introduction of legumes in the rotation is likely to have a beneficial effect on the light-textures nutrient-deficient soils in the area.

Critical success factors appeared to be:

1. The economy of Zimbabwe was on the way back to recovery and government institutions started functioning again.
2. The farmers organized themselves, shared information and negotiated with the GMB. The fact that most (if not all) of the farmers were literate helped the IP to quickly establish itself and allowed the farmers to understand the opportunities and react adequately.
3. All technologies were on the shelf and could be used without much further testing (e.g., fertilizer application, maize-legume agronomy). A district extension agent, who is also a member of the district-level IP, came regularly to the village and helped the farmers with advice and training in technologies.
4. The government maintained a simple dust road which could be used by the farmers to reach the GMB, some 65 km away.
5. Fertilizer and seed were available through the GMB at subsidized rates.
6. The GMB could provide credit to the farmers, which could be repaid at harvest with maize grain (the AgriBank was not yet resourced and could not provide credit).
7. The farmers were free to sell their maize grain at the time they wanted to the buyer (government, private sector) they wanted, except for the amount of grain they owed the GMB as repayment for the credit they had received.

In summary, it seems that all the pieces of the puzzle were present, but without the IP the farmers would not have been able to put them together. Also, the extension agents learned to take a different attitude to problems at the village level: they tried to solve the problems together and in consultation with the farmers, that is, they became “agents of change” rather than only transferring a simple technology and not dealing with other problems.

TOMATOES IN MOZAMBIQUE

On Friday 17 Sep 10 we visited Milange IP (Mozambique) of the Vegetable TF. Before the IP started in November 2009, farmers would grow tomatoes and sell them locally to middlemen or on local markets. Tomatoes were of low quality and prices in the local markets were low. Also the inputs available locally (seed, fertilizer and chemicals) were often of low quality. In addition, fertilizers are not subsidized and 1 bag would cost about 100 US\$ (compared with about 20 US\$ per bag in Zimbabwe).

When the IP was established the farmers organized themselves. They received training in disease and pest control from NARES staff based in Maputo. They further received training in horticultural management through AVRDC, based in Arusha, Tanzania. Some farmer representatives visited AVRDC in Arusha.

The farmers were able to negotiate better prices for fertilizers with local companies and better quality products, with the help of the NARES staff. One private sector seed supplier had purchased tomato (as well as onion and cabbage) seed from a company in Denmark and this seed turned out to be of superior quality and the tomato varieties were much better than what they had grown before. The NARES helped the farmers improve their irrigation management, from surface and shallow groundwater sources.

Because the farmers acted collectively, they were able to negotiate with the market in Makubu, some 200km away (connected through a dust road with Milanje), and got much better prices for their tomatoes in Makubu than in Milanje. This was because the market in Makubu was larger and prices were higher, and because the farmers could guarantee the quantities and quality of tomatoes required by that market. Transport was organized directly by the farmers through the market in Makubu.

In addition to tomatoes, the farmers would also sell onions and cabbage. Their income had increased significantly.

Critical success factors appeared to be:

1. The farmers organized themselves and shared knowledge and acted collectively with regard to input and output markets.
2. With the help of AVRDC and IP staff farmers received training in horticulture and control of pests and diseases, and received information about improved vegetable varieties (as well as seed).
3. The farmers were collectively able to purchase fertilizer of good quality and seed imported from Denmark for a reasonable price.
4. The farmers were able to improve their irrigation management with the help of NRES and IP staff.
5. The farmers were able to access a better market (higher prices) because they acted collectively and could guarantee quality and quantity of their products.

It is noteworthy that in this case the IP was successful in a situation where markets were dominated by the private sector and where there were no subsidies on agricultural inputs. At the same time, the success of the IP critically depended on the ability of AVRDC and other partners to provide expertise, technologies and training to the farmers.

Site selection in PLS²⁷

The SSA-CP has been conducted in three Pilot Learning Sites (PLSs). A PLS is essentially a continuous geographic region that is located in 2 or 3 SSA countries and that can be characterized by a number of agro-ecological, socio economic and policy criteria. The PLSs were essentially selected by the SROs (ASARECA, CORAF/WE CARD and SADC/FANR) on the basis of certain shared criteria including spatial (e.g. administrative boundaries, climate, farming systems, soils, length of growing period and market access) and non-spatial ones (institutional and policy environment, social capital, commercial sector linkages, potential for impact).

The three PLSs (Kano-Katsina-maradi, Lake Kivu, Zimbabwe-Mozambique-Malawi) cover a wide range in agro-ecological, socio-economic and policy conditions. The PLSs were stratified according to a number of criteria that were considered relevant for the implementation of the IAR4D concept. In implementation of the design there were some differences between the PLSs.

Site selection in ZMM

In ZMM, compared to Lake Kivu, complete randomization was difficult to implement. This was because the TF started implementing research activities and selected initial project sites during the 2006/07 season (before the development of the research framework and its RCT methodology in November 2007) as they did not want to lose an agricultural season resulting from delays in the signing of agreements, disbursement of funds and approval of work plans and budgets. The TFs used a quasi-experimental design. GIS mapping techniques were used for selecting districts for assigning to IAR4D treatment and comparison sites.

In the ZMM PLS criteria used for stratification were rainfall, population density and market access. For each criterion 3 classes were distinguished: low, medium and high. This led to the identification of development domains (DD).

The next step was to select the districts in which the project would be conducted. In each of the 3 PLSs there were 3 different Task Forces (TF) with different programmatic foci. In the ZMM PLS these TFs and their foci were:

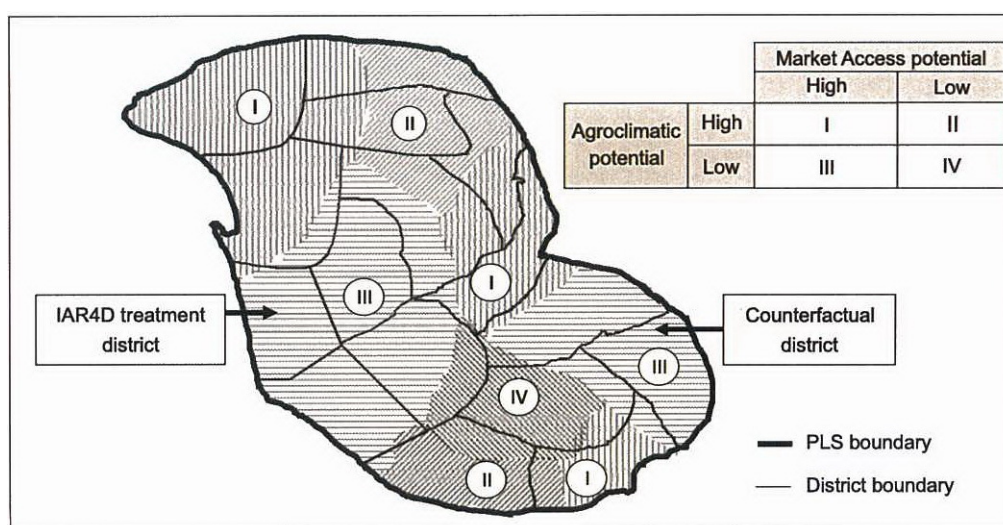
- The Soil Fertility Consortium for Southern Africa (SOFECSA) Task Force by CIMMYT, which focused on integrated soil fertility management (ISFM)
- The Conservation Agriculture (CA) Task Force by CIAT, which focused on conservation agriculture
- The Vegetables Task Force by IPGRI (Bioversity), which focused on vegetables.

Each TF selected its own set of Districts for IAR4D (4 Districts) and counterfactuals (4 Districts) and conducted its own baseline survey. The TFs chose independently the criteria they used for DDs. Figure 1 below shows district selection for the SOFECSA TF following two criteria at two levels: Market Access Potential (High and Low) and Agro-Climatic Potential (High and Low). This resulted in 4 simplified DDs.

As can be seen from the Figure, the districts were not entirely homogeneous with regard to the 4 DD criteria. The selected districts had a significant extent of a particular DD. There was an attempt to select spatially separated but criteria-wise similar Districts for IAR4D and for Counterfactuals (Conventional Extension and Clean).

²⁷ Summarized from documents received from the SSA-CP

Figure 1: Illustration of stratification of a PLS by four development domains



IAR4D and Counterfactual Districts were further subdivided in lower administrative units. The administrative units between Districts and Villages or Communities are called Ward in Zimbabwe, Extension Planning Area (EPA) in Malawi and Comunidade or Povoado in Mozambique. The IAR4D is implemented at the village or community level, and therefore this administrative level is quite important for the SSA-CP.

In principle the intermediate- level administrative units were selected using a stratified randomized procedure. However, in practice this was not done, because of the limited number of intermediate administrative units that remained after stratification. The stratification had to do with the DD characteristics. Only administrative units with more than 70 % of a particular DD were selected.

The procedure for village selection involved four steps shown below. The CA-TF used three criteria for the DD classification: rainfall, population density and market access.

Four step procedure:

1. Determine DDs for each district
2. Select Extension Planning Areas with at minimum 70% of the DDs (disqualify the others)
3. Randomly select Extension Planning Areas (2 for intervention, 4 for counterfactual)
4. Randomly select villages within the selected wards (i.e. villages are not directly connected to the DDs)

Procedure for village selection; Balaka and Blantyre Districts, Malawi

Step 1 – Determine the Development Domains

Overview of the DDs in the 2 districts; the selected DDs are shown in bold

Distict	Balaka District (IAR4D)				Blantyre District (Counterfactual)			
Criteria	Rainfall	Population	Market	%	Rainfall	Population	Market	%
DD	High	Moderate	High	31	High	Moderate	High	16
DD	High	High	High	66	High	High	High	79
DD					Moderate	Low	High	3
Total				97				98

Step 2 – Determine percentage of the selected DD in each administrative unit²⁸

EPAs in Balaka District (IAR4D)			EPAs in Blantyre District (counterfactual)		
Name of the EPA	% area in selected DD (High-High-High)	Valid (Yes/No)	Name of the EPA	% area in selected DD (High-High-High)	Valid (Yes/No)
Ulongwe	77.3	Yes	Lirangwe	75	Yes
Bazale	81.8	Yes	Kunthembwe	57.9	No
Mgaza	80	Yes	Chipande	96	Yes
Mpilisi	83.3	Yes	Ntonda	91	Yes
Utale	61.2	No			
Phalula	22.2	No			

Those with below 70% of the selected DD were disqualified.

Step 3 – “Random” selection of EPAs

The remaining EPAs per district were order randomly. CA-TF then selected EPAs for each intervention district by taking the two at the top of the randomized list; and for each counterfactual district by taking the top-four from the randomized list (if not available then those available were taken).

Selected EPAs for Balaka	Selected EPAs for Blantyre
1. Bazale	1. Lirangwe
2. Mgaza	2. Chipande
	3. Ntonda
	4. -

Thus in Balaka District there were 4 EPAs that qualified and 2 were selected for IAR4D, whereas in Blantyre District there were 3 EPAs that qualified all were selected although 4 would have been needed.

Step 4. Randomly select villages within the selected EPAs

The complete list of all villages within the selected EPAs of each district were order randomly. Starting from the top of the randomized list of villages the TF proceeded to select villages. The ‘clean/non-clean’ status was established by using a specifically designed questionnaire. In the IAR4D districts the selection procedure ended when 5 ‘clean’ villages had been selected, and in the counterfactual districts when 5 ‘clean’ and 5 ‘non-clean’ villages had been selected. The remaining villages were not considered. Subsequently 10 households per village were randomly selected.

In the case of the Vegetable TF there was a further stratification in the sense that only villages that were growing vegetables were selected. This was justified regarding the entry point, but may have further limited the ability to follow random selection.

The aim of this complex, partly stratified random selection procedure was to test IAR4D under a wide range of well-defined circumstances. This would facilitate the transfer of the paradigm to other regions.

²⁸ EPA in Malawi

Site selection in Lake-Kivu

The three countries (Uganda, Rwanda and the Democratic Republic of Congo) that constitute the LKPLS have differing administrative systems. In Rwanda there are four geographically-based provinces, which are further subdivided into 30 districts, 415 sectors, cells and, finally, villages. In Uganda, number of districts has grown rapidly in recent years (80 in 2009) and decentralization has moved administrative power to the districts. Provinces thus have more of political than administrative functions. Districts are further subdivided into counties (political rather than administrative boundaries), sub-counties, parishes and villages; sub-county being the smallest local government administrative and planning unit. In the DRC, the highest level of administrative unit is the province. Provinces are further divided into districts, *groupement*, *localite* and finally villages.

The counter-factual sites and action sites where IPs were established and developed needed to be as similar as possible with respect to the agro-ecology, farming system, market linkages, socio-economic and demographic characteristics. Nevertheless, the counter-factual, particularly the conventional or ARD, sites needed to have had greater penetration and coverage by agricultural research for development organisations or projects.

Given the limited number of districts within the LKPLS and hence the difficulty of finding suitable counterfactuals, the most appropriate size for a site was found to be the 4th level administrative unit, which corresponds to a sub-county in Uganda, a *secteur* in Rwanda and a *groupement* in the DRC. In Uganda, Rwanda and the DRC, a sub-county, *secteur* and *groupement*, respectively are the smallest local government administrative and planning units.

Stratified random sampling method was used to select eight administrative units in each country. In each of the three countries, four sub-counties/secteurs/groupements each were assigned into IAR4D and non-IAR4D sites. The treatments were applied at the fourth rather than the third level administrative units. Thus, the counterfactual sub-counties had both clean and conventional (ARD) sites, and a sub-county was delineated for IAR4D sites.

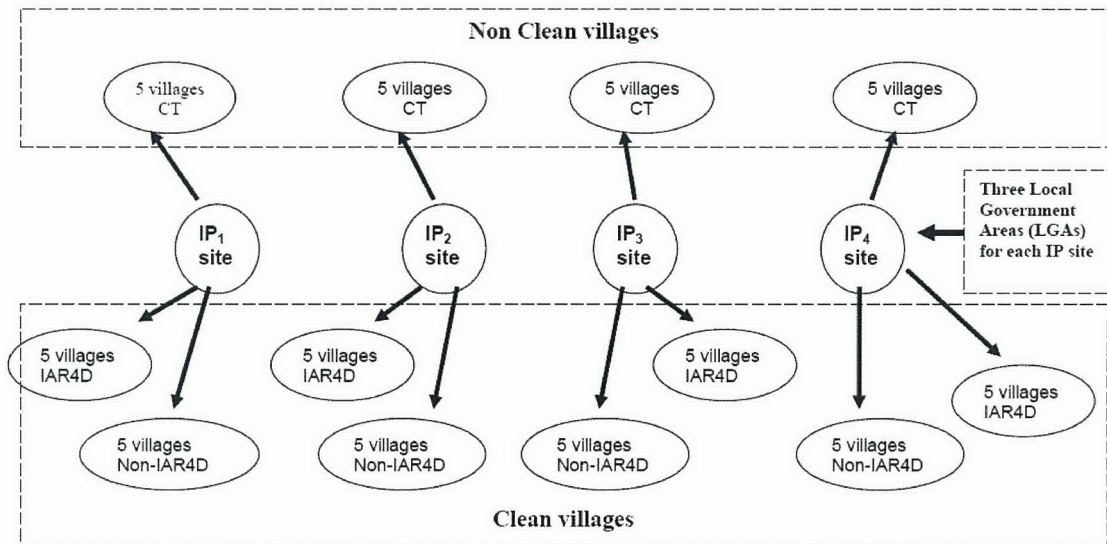
The strata from which randomization of the sub-counties/secteurs/groupements were to be done were formed on the basis of market access and agro-climatic potential. Thus, the sites were characterised as good and poor market access as well as high and low agro-ecological potential. Although the SSA-CP's proposed research plan required that the sites be stratified on the basis of agro-climatic potential and market access, most of the sites in the LKPLS were found to exhibit little or no heterogeneity with respect to agro-climatic potential. For example, only a few regions that fall within the LKPLS could be classified as low potential, although this classification was based on the extent of soil degradation attributable to over-cultivation or soil erosion, but not on the average annual precipitation.

While each task force in the LKPLS attempted to address one key question concerning the degree to which biophysical and socio-economic conditions at a given site affect market participation, productivity enhancement and investment in NRM, market access featured as the central theme for many interventions in the LKPLS. Consequently, market access was chosen as the key variable to be used in the stratification of the sites. The PLS was stratified according to good and poor market access, and sites with very poor access to all market types were excluded from the sample of potential sites. Sites were then selected to ensure that of the four sites in each country two had good market access and the other poor market access. A counterfactual site exhibiting similar characteristics as its corresponding action site in terms of market access was also selected for each site (see Table 1). there were minor deviations from this plan in Uganda where market opportunities determined site selection in two cases.

Site selection in KKM (Northern Guinea Savannah TF)

In the NGS, each IP site consists of three Local Government Areas (LGA). One LGA holds 5 villages for each treatment. In total 12 LGAs were selected for the 4 IP sites as shown in Figure 2.

Figure 2: Selection of villages in NGS-TF



IP = Innovation Platform; CT = Conventional Treatment; IAR4D= Integrated Agricultural Research for Development

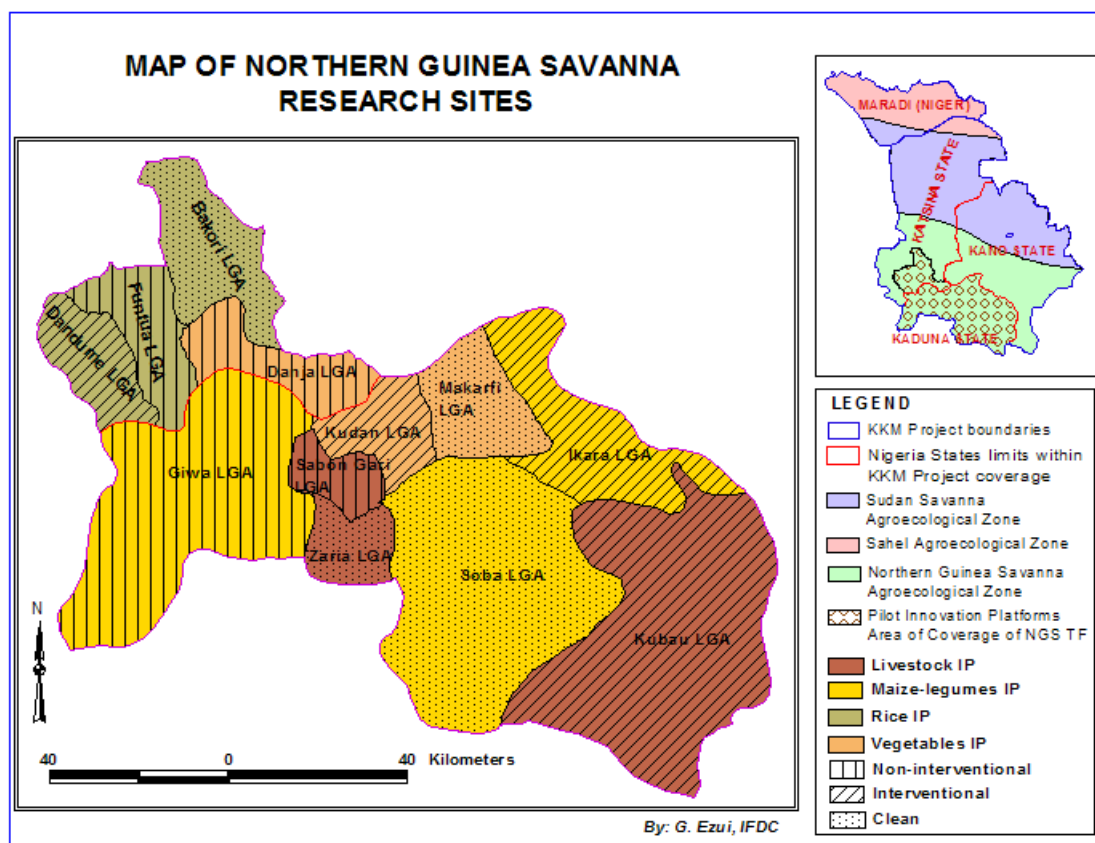
The focal villages were examined prior to implementation of IAR4D to see whether or not they had had conventional Research & Development or IAR4D type of projects in the past 2-5 years. Villages were classified into 2 types: (a) clean villages that had neither had IAR4D nor conventional projects in the last 2-5 years; and (b) conventional approach villages that had had projects identifying and promoting and disseminating technologies in the past 2–5 years. Clean villages were allocated to IAR4D and non-IAR4D-nonconventional treatments. Non-clean villages were allocated to conventional approach treatments.

The processes of LGs and villages selection for the research sites in the NGS followed different steps as shown below.

1. Establishment of an exhaustive list of Local Governments (LG) falling in the NGS zone which covers part of Kano State, Katsina State and Kaduna State.
2. Rice, maize, Fadama vegetables and livestock are the key commodities which were the basis for the development of IPs. Therefore, the LGs listed at step 1 were purposively clustered in four groups according to existing potentials for rice production, Fadama vegetables system, maize – legumes system, and livestock production.
3. Each group of LGs obtained at step 2 was disaggregated in two classes: one class of LGAs where clean villages are most likely to be identified and the second class for non-clean villages. For each production system, two (2) LGAs were randomly selected for the first class (dominantly clean villages) and one LGA in the second class where non – clean villages can be identified. Twelve (12) LGAs were randomly selected.
4. An exhaustive list of villages was established in each LGA that was randomly selected for each production system. These villages were classified into clean villages and non-clean villages.
5. Select randomly (i) for each production system, 5 villages for IAR4D intervention and (ii) 5 villages for no IAR4D intervention among clean villages; and 5 villages that have conventional treatment of research – development activities in the cluster of non–clean villages of each system. Each production system on which an IP was built (IP site) had 15 villages and in total, 60 villages were selected for the 4 IPs sites.

6. Step 6: The GPS of the selected IP sites with the LG areas and villages were taken and checked by IITA and FARA to ensure that they were representative of the production systems in the chosen areas

The baseline surveys were conducted in the 60 villages. Ten households were randomly selected in each village making a total of 600 households for the baseline survey taking into consideration intervention villages, counterfactuals (clean villages) and the control (conventional ARD villages) for comparison. The four IPs, action sites and counterfactual sites are shown in the map below.



Annex 8

CGIAR Sub-Saharan Africa Challenge Program

Evaluating the IAR4D approach using a randomized control trial methodology

A desk evaluation prepared for the Independent Science and Partnership Council of the CGIAR by Alain de

Janvry and Elisabeth Sadoulet

University of California at Berkeley

October 24, 2010

Revised November 13, 2010

I. Posing the problem

The Sub-Saharan Africa Challenge Program proposes to use a new approach to using agricultural research for development called “integrated agricultural research for development” or IAR4D. The basic proposition is that past approaches to using R&D in SSA have generated outputs that have met with low uptake beyond localized success stories. The result has been overall low returns to investment in agricultural R&D in SSA, and continued under-performance in using agriculture for development. The hypothesis advanced by the Challenge Program is that this has been due to the way conventional research and use of research outputs have been organized, with an insufficient locally-adapted comprehensive approach and in particular insufficient stakeholder participation. As an alternative, the IAR4D will operate on the basis of geographically defined “Innovation Platforms” that allow a local integrated approach with a comprehensive and participatory identification of the key constraints and opportunities to be addressed by research, a multidisciplinary approach, participatory research, capacity building, and learning to continuously improve the use of agricultural research for development.

In itself the concept is quite attractive. However, before being eventually massively applied across SS Africa, it needs to be tested in “pilot learning sites”. Three such sites were designated for this purpose: the KKM site covering parts of Nigeria and Niger, the ZMM site covering parts of Zimbabwe, Mozambique, and Malawi, and the Lake Kivu site covering parts of Uganda, the DRC, and Rwanda.

The Challenge Program started in 2005 with an 18 months inception phase, followed by a three years research phase with the objective of testing the validity of the IAR4D approach in the three selected pilot learning sites. The research phase was expected to test three hypotheses about the approach:

1. Does the IAR4D concept work and can it generate international public goods and regional public goods to end users?
2. Does the IAR4D framework deliver more benefits to end users than conventional approaches?
3. How sustainable and usable is the IAR4D approach outside its test environment?

For this, an ambitious stratified randomized control trial (RCT) approach was designed, with randomly selected districts in which pilot learning sites would be selected for the IAR4D to be introduced, and other randomly selected districts in which villages would be selected as controls to measure impact. Testing these hypotheses will take some time since it requires: (1) observing conditions before the approach was introduced in the treatment and control villages, (2) implementing the IAR4D approach for a sufficient period of time to have visible impacts on selected outcomes, and (3) observing again conditions after this period to measure impact by double difference between prior and posterior conditions in treated and control villages.

To this date, the methodology has been fully developed, and a baseline survey has been implemented and analyzed for the Lake Kivu pilot learning site. Although it appears that some preliminary results from the endline survey have been obtained, we did not receive them, and therefore this review is solely based on the baseline analysis. Baseline surveys are still in progress or results not yet released for the other two sites.

What can be done in this 2010 external review of the three-year research phase of the IAR4D concept is thus to: (1) critically assess the validity of the proposed RCT research plan to hypothesis testing and the first phase of its implementation, and (2) monitor and evaluate initial steps in implementing the IAR4D approach. This brief desk report takes on the first task; the second task is being implemented by a review panel under the leadership of John Lynam.

In reviewing the research plan, we address the following questions:

1. Is the RCT research methodology adequate? How could it be improved if needed?
2. Are results from the Kivu baseline survey adequately used? How could they be used differently?
3. Are RCT approaches applicable, and the best approach, to the research questions being addressed?

Before engaging in a critical review of the research plan, two comments are in order:

1. Designing an RCT approach to hypothesis testing is no trivial matter. The approach is relatively new and much is being learned as to how to use it for specific research questions, each of which requires its own design. Hence, any critical assessment of use of the approach should itself be seen as part of a learning process.
2. Criticism of the research plan does not imply any criticism of the IAR4D approach: until the three research phases mentioned above have been completed (baseline, implementation, and subsequent surveys) the jury is still out. Hence, comments on the research plan do not presume anything on the outcome of the hypotheses being tested.

II. Research methodology

2.1. Research design

The proposed research design for each of the three regional Pilot Learning Sites (KKM, KIVU, and ZMM) can be summarized as follows:

1. Establish a list of all districts and classify them in four types by high/low agricultural potential and good/poor market access.
2. Each of the three task forces in the Pilot Learning Site operates within one type of district. Randomly select four districts that will be assigned to receive the IAR4D treatment (Innovation Platforms) and four districts assigned to be controls.

The district is thus the level for the randomized assignment to Treatment or Control: There will be in total 36 "treated" districts (i.e., 36 districts which will host Innovation Platforms and include treated villages) and 36 control districts over all three Regional Pilot Learning Sites in the SSA-CP.

3. In each of the four IAR4D and four control districts under one task force, establish a census of villages and characterize them as "clean" (not having received any research and extension services in the past 5 years) or "conventional ARD" (having received conventional agricultural and rural development interventions in the past 5 years).
4. In the IAR4D districts, randomly select 5 villages among the "clean" villages, and 10 households in each village.
5. In the Control districts, randomly select 5 villages among the "clean" villages and 5 villages among the "conventional ARD" villages, and 10 households in each village.

Villages are thus stratified: There will be 5 clean villages and 50 households observed in each IAR4D and each Control district. There will be an extra 5 conventional ARD villages and 50 households observed in each Control district, but no corresponding conventional ARD villages in the IAR4D districts.

6. On the ground implementation of the IAR4D is done at the village (or focal village) level.

There are thus 20 treated and 20 control villages per Task Force (60 treated and control per site). The stratified randomization into Treatment and Control is however done at the district level (12 treatment and 12 control districts per sites).

2.2. Comments on the research design

1. This design may allow to measure the impact of IAR4D compared to no-intervention (clean), but not that of IAR4D compared to conventional ARD using the property of randomized sampling

This is because there is stratification of villages in “clean” and “conventional” and only “clean” villages are retained for observing outcomes in the Treated districts. So these can only be compared to Control “clean” villages, but not to Control “conventional” villages, even though comparing the IAR4D approach to the conventional ARD approach is one of the main questions asked from the pilot experiment.

The IAR4D and ARD villages now differ systematically in whether or not they previously received an ARD project, which can be strongly correlated with important village characteristics (e.g., the village seemed favorable for a development project, the village was doing badly and needed assistance under the form of a development project, etc.) and can also affect the responsiveness of the village to a new treatment. Suppose for example that conventional extension services went where they could find the most “entrepreneurial” farmers. The simple ex-post comparison of IAR4D villages and control conventional ARD villages will measure the difference between IAR4D among non-entrepreneurial farmers and conventional extension among entrepreneurial farmers. This is likely to lead to a gross underestimation of the IAR4D treatment effect. It is equally easy to imagine a selection characteristic that would lead to an overestimation of the IAR4D treatment.

A double difference with baseline and ex-post observations will not solve the problem. For example, those villages already having received an ARD project may now be at the point where another ARD project has diminishing returns. Doing a double-difference between IAR4D and ARD villages would then overestimate the efficacy of IAR4D.

Estimation of the impact of IAR4D relative to ARD thus requires calling upon alternative methods, knowing that these samples have been selected from two different populations of villages (clean and ‘having received ARD’), that differ on both observables and unobservables. The case remains to be made for the identification method that will be used. The difficult part is not their difference in terms of observables but in terms of unobservables (notably in their dynamics). This will require being able to assess in a credible fashion the ways in which those villages differ as they affect the outcomes of interest, or find valid instruments for their receiving ARD in the first place.

2. Sample size

There are 3 geographic sites where the program intervention is located. The IAR4D programs will have different objectives and instruments in each of these 3 locations. So there will not be 36 districts getting the same type of IAR4D treatment, more like 12 & 12 & 12. Even with different objectives across the 3 locations, it seems reasonable that the results could still be pooled in some way and compared so that you have 36 IAR4D clusters being compared in regressions with the 36 control clusters. In each cluster, there will be 5 villages. So while the actual treatment is implemented at the village level, there may be a case for high intra-cluster correlation as they belong to the same IP. This is an empirical question. If the intra-cluster correlation is low, then 180 treated and 180 control villages likely gives a large enough sample. On the other hand, if there is a high intra-cluster correlation (in the way the treatment is implemented and its impact on the population), then the design is more like a comparison of 36 treatments and 36 controls, which may not be enough to provide sufficient power to achieve statistical significance of differences in expected impacts. To know this, one needs to do ex-ante power calculations.

As an example of power calculation, consider an outcome such as the adoption rate. Suppose that the adoption rate is 30 percent in the control group. IAR4D would be considered beneficial if we can reject the hypothesis of no increase in adoption, with statistical significance of 95% and power of 80%. Without any

covariates, the standard error is $\sigma = .21$. Assuming intra-cluster correlation $\rho = 0.4$, 72 clusters equally split between treatments and controls with 50 households in each cluster would give a minimum detectable effect size (MDE) of 8.3 percentage points (and 9.8 percentage points if $\rho = 0.6$). If usage of covariates from the baseline survey reduces the standard error to 0.16, then MDE = 6-7 percentage points. In this example, the proposed sample size of 36 innovation platforms would not allow to detect increases in adoption of less than 6-10 percentage points.

Now, if one cannot aggregate the analysis over all three geographical sites, with 24 clusters only, the minimum detectable effect size is 10-17 percentage points. This means that one could not establish that the impact of IAR4D is significantly different from 0 unless the impact is to increase adoption from 30% to 40-47%.

3. Improving the randomization

Randomization is meant to provide a means by which observable and non-observable variables in treatment and control units have identical distributions. This statistical property is, however, only true with an extremely large sample size. With 12 or 36 randomized units in the Treatment and Control, it is impossible to imagine that the average treatment district will be similar to the average control district. Stratifying the districts by agricultural potential and market access certainly improves on this randomization. An even more robust method that is frequently used would have been to match districts in pairs (using as many characteristics as possible) and then to randomize Treatment and Control within each pair. This approach also has the great advantage that it allows rollout of the program across districts that can start from the most favorable to the least favorable pair without imposing a bias on measured impacts.

One could also have proceeded to match the villages, in each pair of Treatment and Control districts as above, in pairs themselves. And then to randomly choose 5 pairs of villages.

While it will always remain a challenge to do statistical analysis with interventions that take place at a relatively high level (such as the district in this particular case), there are ways to finely stratify the sample to obtain better randomization results.

4. Changing the design to be able to measure the impact of IAR4D relative to conventional ARD

While the current selection of the villages does not allow a comparison of IAR4D relative to conventional ARD, simple modifications of the design that would take advantage of the fact that the choice of districts was truly random within each stratum, could allow to do so. If on the other hand the districts were already selected on the basis of an average level of cleanliness (as seems to be the case in the Kivu area), then what follows does not apply.

- (a) The current implementation design will provide IAR4D interventions in treatment districts that include both conventional ARD villages and “clean” villages. By collecting data on the conventional ARD villages in IAR4D districts, and comparing them with the conventional ARD villages in control districts, one could measure the impact of IAR4D in districts that had previously received conventional ARD. In a double difference framework it will reveal whether switching to IAR4D improves the selected outcomes compared to keeping the villages under the conventional ARD approach.
- (b) Furthermore, if one really wanted to measure IAR4D against ARD, starting from a situation of almost no intervention, one should have randomly selected another set of 4 districts in each district strata to implement a conventional ARD project. Best of course would be to start this analysis with a random choice of IAR4D and conventional ARD districts from districts that at baseline had little conventional ARD. This would have been feasible if conventional ARD was not too wide spread. This needs to be designed carefully with a good knowledge of the environment and of the reasons for a low coverage of

traditional ARD. If, on the other hand, conventional ARD is already widespread, untouched districts left without conventional ARD would necessarily be a very selected group.

2.3. Comments on testing the research hypotheses

Tests of the impact of IAR4D can be performed on any outcomes that can be observed in both the control and treatment villages, e.g., adoption, land productivity, knowledge, etc. Possibly one could measure impact on food security, income, assets, and resilience to shocks, although one has to be aware that assessing “resilience to shock” or “food security” is difficult without fairly extensive data collection in multiple periods. For all outcomes that pertain to IAR4D only (such as research plans, level of congruence between research and constraints and opportunities identified by IP, etc., mentioned in 7.1 on testing for the first hypothesis), there will be no comparable observed variables in the control districts and hence no measure of impact of IAR4D.

1. First hypothesis: Test that IAR4D has some positive impact on a number of outcomes

One cannot test for a conditional impact such as “if the innovation platform is functional with its five components ... , then IAR4D has some positive impact on a number of outcomes”, as stated in section 7.1. This is because the conditional part of the statement is an endogenous outcome of IAR4D that will vary across villages in ways that are correlated with many other unobserved variables. What can be tested and measured is the overall impact of the IAR4D approach on a number of outcomes.

In terms of heterogeneity, and provided one has enough degrees of freedom, one could get at some measures such as the average impact of IAR4D among villages with certain given exogenous characteristics, using either sub-samples or interaction terms.

2. Second hypothesis: Test of IAR4D against conventional ARD

As explained above, the current research design does not allow this comparison.

3. Third hypothesis: If IAR4D works in different Pilot Learning Sites context, its results can be extrapolated

As mentioned above, it is not clear at all that one can detect a positive impact in each of the three sites, because of sample size. And even if one detected impacts in these three sites, with only 3 sites there is no possibility of extrapolating to other places in any quantitative or rigorous way. The methods invoked in the framework paper propose an extrapolation from an already large set of contexts. Very approximately, if one could characterize how impact varies across a set of characteristics (household, village, or regional level), then one could attempt at predicting for other distribution of these characteristics. But, for a start, the three regional Pilot Learning Sites vary by more than three characteristics. So there is no easy extrapolation beyond these three sites. And it remains to be seen whether there is enough power to find heterogeneity of impacts across, for example, village characteristics in the districts where the IAR4D has been implemented.

This does not say that it will not be interesting to look at results across the 3 regional areas (or across the 9 task forces), but this will more likely consist in comparisons of standard evaluations rather than quantitative assessments.²⁹

2.4. Site selection in the Lake Kivu Pilot Learning Site

²⁹ Use of the synthetic control matching approach mentioned in the text to establish a counterfactual out of several potential comparison units is only useful with long panel data, when one has many observations over time on the treated unit and the potential comparison units. It is consequently not clear how this will be useful in this context where, for each treated district, one will only have one observation before and possibly a couple of observations after intervention.

The special report, “Selecting sites to prove the concept of IAR4D”, describes the actual selection of sites in the Lake Kivu Pilot Learning Site. This selection differs from the overall framework in two ways:

- (i) Stratification of the districts is done in only one dimension (market access), which raises no particular problem.
- (ii) Districts are selected non-randomly, which raises serious issues, because all the villages selected within any district pertain to the same treatment group.

The stated objective is to be able to compare the IAR4D approach to the conventional ARD approach. To this end, rather than proceeding to a random choice of districts for treatment and control, the research team proposed to use explicit criteria along which the districts are comparable. Hence in each stratum (good or bad market access, in each of the 3 countries), districts are characterized by level of ARD interventions, soil quality, slope, water access, etc. In each stratum 2 districts are chosen to be as similar as possible on all criteria, except for the intensity of ARD interventions on which the research team wants them to be as different as possible. The “low intervention” district is then assigned to be the IAR4D district and the “high intervention” district to be the conventional ARD district.

Hence, even at the level of districts, this selection gives districts that are by construction not comparable. And this is of course carried out to the village level, since all the selected villages in one district are either all treated or all control. This is the same issue as what was discussed above regarding the selection of villages. The IAR4D and ARD districts now differ systematically on whether or not they previously received an ARD project, which could be strongly correlated with important district characteristics (e.g., the district seemed favorable for a development project, the district has dynamic leaders, etc.) that can also affect the district’s responsiveness to a new treatment.

With districts systematically different in some important ways (very related to the purpose of the intervention), even “clean” villages in Treatment and Control districts are likely to be quite different. Clean villages in the Treatment area are just any village of the district, while clean villages in a district where there have been intensive ARD interventions are likely to be quite special in many ways.

There is no obvious way of correcting for this fundamental selection procedure in project placement. This means that whatever impact analysis strategy is designed will have to be done with very careful attention to the selection problems introduced by the researchers themselves in defining their sampling. And as before, the more problematic issues are not related to the observable differences across treated and control villages and districts, but to the unobservable differences that made some receive ARD and some others not. It will be a challenge to argue that these unobservable differences that cannot be controlled for are unrelated to the outcomes of a new extension program like IAR4D.

We are fully aware that simple (or stratified as proposed in the original design) randomization can be extremely difficult to implement in complex programs for either practical, political, or any other good reasons. In such cases, the method can be defined in a way that combines aspects of selection, but both the sampling design and the identification strategy have to be defined jointly, in a very rigorous fashion. For example there could have been a lot of pre-matching between areas, provided at the end some arbitrariness / randomization is even locally introduced that allows identification of the program. When the evaluation is planned at the same time as the implementation this is usually far superior to any ex-post recuperation using standard econometric method as proposed here. This is because each method relies on assumptions that may or may not be verified unless the sampling design has been purposefully defined.

III. Use of the baseline survey³⁰

³⁰ Document: “Lake Kivu pilot learning site baseline study. Socio-economic baseline study”.

The baseline survey was done in 2008 and data are available for the Lake Kivu pilot learning site. What can be done with these data toward assessing the RCT approach and learning about the IAR4D approach (even assuming that there was random selection of districts)?

3.1. Validation of the randomization across clusters of villages

The 24 districts in the Kivu pilot learning site were assigned to the IP treatment (12 clusters) and the control (12). In the control districts, villages were randomly drawn from the “clean” and conventional ARD categories. Validity of the randomization can be assessed by testing whether there are significant baseline differences in the households located in these three groups of villages. This is done within countries (DRC, Rwanda, Uganda) because the sites are quite different. Tests of significance can be done in two ways:

(1) Test of difference of means or percentages for each variable in the survey in the broad categories of indicators: Human capital, physical capital, access to rural services and economic networks, and adoption of production technologies. What results show is that there are many significant differences. In these tests, observations should be clustered at the village cluster level to calculate standard deviations. These tests are missing in Table 4. Large differences in point estimates are sometimes not significant simply because the variance is too large. For example value of crop production in DRC is \$424/acre in conventional villages and \$189/acre in IP villages, yet are apparently not significantly different.

(2) Using treatment fixed effects in estimating the determinants of adoption. The test of significance is against the base case of “clean” sites. However, also needed is to test for difference in coefficients of the IP and conventional treatments.

Hence, even if we agree with the meaning of the treatment and controls (as discussed above), these tests are still largely to be made. The conclusion that: “Our study showed that most of the human, physical capital endowments in the selected villages was not significantly different across treatment sites, suggesting that there was no significant bias in the site and household selection. This suggests that the approach used in the site selection process minimized placement and selection biases”, is still not verified.

3.2. Analysis of the baseline survey data

The base line survey is also used to analyze determinants of adoption and of land productivity. One has to be careful that these results cannot be interpreted causally. Estimated coefficients are partial correlations that can be read as such but not to infer implications.

In the adoption equation (Table 8), most right hand side variables are endogenous choice variables, and the equation also suffers from omitted variable biases. Example of choice variables that are used as “determinants” of adoption are: access to market information, access to informal credit, participation in research or in technology demonstration activities, contact with extension agents, ownership of durable goods such as a bicycle and farm equipment, education level achieved, membership to farmer groups, etc. In addition:

Standard errors need to be clustered across village clusters.

Units of measurement need to be given.

Marginal effects need to be provided, or better linear probability estimates used so the coefficients can be interpreted.

In Table 9, the determinants of crop productivity are estimated. The equation suffers from similar endogeneity biases which means that estimated coefficients are not causal. Because there is concern with endogeneity, the adoption variables used in the productivity equations are also predicted values from the adoption equation. This is presented as an instrumental variables approach. Looking at the exclusion restrictions in the productivity equation, we see that variables used as instruments were: market

information, use to informal credit, use of formal credit, participation in research or demonstration plots, and contacts with extension agents. Unless one has a strong theory explaining why instruments would predict adoption and have no influence on productivity, it is well known that it is not possible to instrument. In this case, it is clearly impossible to believe that these variables describing access to rural services do not have a direct impact on crop productivity, invalidating their use as instruments.

As a consequence, as is not surprising with cross sectional survey data, it is not possible to identify causal determinants of adoption and crop productivity. This will have to wait for additional data allowing to control for the many non-observable plot, household, and village characteristics that influence adoption and productivity. This does not mean that useful diagnostics of adoption and productivity cannot be extracted from the baseline survey, but they should not have pretense at causality.

IV. Other comments

4.1. Test of hypotheses³¹

In presenting the RCT methodology, statement is made that use of the baseline and endline surveys will allow to test the following hypotheses:

- “Strong producer organizations and collective marketing increase returns to land and labor.”
- “R&D integrated with development partners has greater impact.”
- “Information sharing enhances adoption of technologies.”

One has to be careful that the RCT is at the level of Innovation Platforms. This will allow to test whether households in an IP have significantly different outcomes than households in the controls. Events such as strong producer organizations, the role of development partners in R&D, and information sharing mentioned above are endogenous outcomes of the IP treatment. They can be analyzed as intermediate outcomes in terms of the role of IP versus controls, which is useful. They however cannot be identified as causal to adoption and productivity. The RCT methodology at the level of districts does not identify pathways. Correlates can be measured (via interactions between treatments and these intermediate outcomes), but they are only suggestive of what may be at work on the IAR4D approach. Hence, we cannot claim that the approach will help test these hypotheses. One could have added some “encouragement design” or similar light additional interventions that would typically have been used as instrument for any of these other intermediary outcomes.

4.2. Accessibility versus affordability³²

One of the interesting conclusions of the baseline survey analysis is the proposition that lack of access to technology is a more important determinant of low adoption than low affordability in explaining low levels of adoption. The household survey collects data on input and output prices at the farm level. This is rare and should be used in the analysis. Yet, prices are not used in the analysis to look at affordability. Correlations with access vs. input/output price ratios would be an interesting indicator of the relative merits of these two potential explanatory factors of low adoption.

4.3. How to identify impact in a RCT approach?

The approach selected to implement the RCT approach consists in a baseline survey, followed by a period of intervention in the selected IP districts, and one or several endline surveys. No information is being collected between baseline and endline, when in fact useful information is being generated through gradual implementation. There is thus another way of accelerating and improving identification of impacts

³¹ Document: “Proof of IAR4D concept-Approaches and baseline economic study results and implications”.

³² Document: “Baseline survey report: Status of natural, social, financial, human, and physical capitals in the Lake Kivu pilot learning site”.

consisting in a rollout of the IAR4D approach across designated districts and annual data collection on all sites (before and after treatment, and controls). Data collection can largely be administrative to monitor conditions before and without intervention and after intervention. This has the advantage of providing panel information on districts, permitting to control for unobservables through district fixed effects. This rollout methodology with collection of panel data is particularly adequate when an intervention such as the IAR4D is being introduced as part of an RCT experiment. It should be considered for future implementation of an RCT approach to hypothesis testing on the IAR4D approach. Note however that even in this approach, one has to be careful to collect data on all the districts that will eventually receive the treatment so as to constitute a (largely) balanced panel.

V. Answers to the questions raised in the terms of reference for this evaluation³³

5.1. Are the hypotheses as stated testable?

Can the relative validity of the IAR4D approach versus the conventional and the no-approach be tested? This hypothesis can be tested with a randomized control trial for as long as the methodology is properly designed and implemented. This includes most importantly, as discussed above: proper choice of counterfactuals and careful sample design to meet power of test calculations. As we have argued, the methodology as currently designed allows to test the IAR4D approach versus a no-approach, not against the conventional ARD approach. We also noted above, that it is unfortunate to have to rely exclusively on ex-post methods for the evaluation of the impact of the IAR4D approach versus the conventional ARD, instead of refining the design to allow a more robust evaluation method.

What is the capacity of the IAR4D approach to produce regional and international public goods? This is a question about external validity of the results achieved in the treatment sites. The RCT can only measure impact in the corresponding pilot learning sites. Any extrapolation beyond the sites has to be made using: (1) repetition of the test in other sites, or (2) construction of mega-domains with similar observable characteristics as the pilot learning sites, the latter as an approximation based on observable site characteristics. Extending the internal validity of an impact analysis is normal with any pilot approach and will need to be addressed separately after the approach has been validated in the chosen pilot learning sites.

What is required in site selection to ensure that the IAR4D model is “scalable” outside the areas in which it was tested? These sites should be selected to be representative of larger domains. The IAR4D approach is quite flexible and adaptable to very different contexts since it is a procedure with an endogenous set of instruments and processes. Hence, external validity could be quite broad in terms of the approach, irrespective of differences in the instruments and processes chosen in each particular site.

5.2. Is the counterfactual sufficiently well defined in regards to the hypothesis being tested?

As discussed above, there are two flaws in the design and its application to the Lake Kivu Pilot Learning Site. One is that IAR4D treatments are not applied to conventional ARD villages, making it impossible to test the second hypothesis about the value of the IAR4D approach relative to the conventional ARD approach. The other is that there is a systematic bias in the placement of controls and IAR4D across districts, with the “low intervention” district in a pair of otherwise comparable districts assigned to be the IAR4D treatment and the “high intervention” district assigned to be the conventional ARD control.

It is important that these flaws be rectified before the methodology is applied to other pilot working sites. To our judgment, the main error has been to try to propose a rigid (stratified) randomization that could not be followed. Then to implement a scheme with a completely ad-hoc selection of villages that seems to exacerbate selection problems, without giving elements to address them. And therefore to have to use

³³ Document: “Terms of reference for assessment of the experimental design of SSA-CP research on the IAR4D approach”.

methods typical of ex-post impact analyses, with almost no benefits accruing from the attempt at randomization. This is a missed opportunity to jointly design a scheme of implementation and an evaluation strategy, using the many different ways in which one can create some level of randomization, or elements of exogeneity or discontinuity, including to generate valid instruments. There is no ready made solution to the problem, but this is what a careful elaboration of an impact strategy is all about.

5.3. Is the time period appropriate?

There are many intermediate outcomes that can be observed in the short run that will be good indicators of final outcomes. This includes such endogenous outcomes as organizations, deliberations, investments, plot-level yields and profitability, etc. If the IAR4D process appears fruitful through these short run indicators of success, then there will be high value to plan repeated surveys to track progress toward ultimate outcomes such as income, poverty, education, fertility, migration, etc.

5.4. Is the randomization of innovation platforms adequate?

The unit of randomization in the IAR4D approach is the district serving as an innovation platform. It is consequently essential that proper randomization be made across districts, and that the number of districts be sufficient to be able to test the hypotheses of interest in terms of desired outcomes. As noted above, matching districts in pairs before the randomization is a frequently used method to improve the odds of the randomization in small sample.

5.5. Is the baseline survey instrument sufficient to provide a test of the hypotheses? Can the questionnaire be adapted to the specific context of each PLS?

The treatment is an approach, the IAR4D. The way this treatment will define interventions is endogenous to the learning site. Hence, the questionnaire should be adapted to each particular learning site if one expects that pathways may differ across sites. Good prior case studies and qualitative analyses (e.g., focus groups) are effective ways of identifying what may be specific pathways and of making sure that they are captured in the questionnaire.

5.6. Is the analytical framework proposed sufficient to provide a definitive test of the hypotheses given the range of variability in farming systems, institutions, and market contexts across sites?

Here, the exogenous treatment is the overall IAR4D approach, not the detail of the choices made to implement the approach in each particular innovation platform that are endogenous. Hence, the tests are not on the specific pathways used in each site, but on the overall approach. As such the RCT approach, properly implemented, can test the hypothesis posed.

Did the focus on regional and international public goods skew the research design?

This is a good question: each innovation platform will endogenously choose its own best practice instruments. This is the heart of the approach. These instruments may be regional and international public goods, but they are not chosen as such. Whether the instruments used at the level of a particular innovation platform have regional and international value will depend on how representative these districts are of broader contexts. Key, however, given heterogeneity, is to make the IAR4D approach work for each particular innovation platform where applied, with only secondary concern for the regional and international public good value of the instruments used.

5.7. Are RCT approaches applicable to the research questions being addressed within the SSA-CP?

Yes if properly designed and implemented, and yes if not expecting from the approach more than it can deliver. In particular, the RCT (with all the variations that include stratification, prior matching, etc.) can tell us whether the approach has value over a defined counterfactual approach. It will in general not give us details about pathways and specific instruments endogenously defined within an innovation platform without further randomized experimentation on each particular instrument.

Annex 7

Acronyms

ADP	Agricultural Development Programme
AGM	Annual General Meeting (of the CGIAR)
AGRITEX	Department of Agriculture & Technical Services
ASEARECA	The Association for Strengthening Agricultural Research in Eastern and Central Africa
AUP	Agreed Upon Procedures
AVRDC	the World Vegetable Center
CA	Conservation Agriculture
CAADP	Comprehensive Africa Agricultural Development Programme
CARDESA	Centre for Agricultural Research and Development in Southern Africa
CGIAR	Consultative Group on International Agricultural Research
CGS	Competitive Grant System
CIALCA	Consortium for Improving Agriculture-Based Livelihoods in Central Africa
CIAT	Centro Internacional de Agricultura Tropical
CIMMYT	Centro Internacional de Mejoramiento de Maíz y Trigo
CORAF	Conseil Ouest et Centre Africain pour la Recherche et le Développement Agricoles
CP	Challenge Program
CRP	CGIAR Research Program
CRST	Cross-site Research Support Team
DD	Development Domain
DFID	Department for International Development
EC	European Community
EPA	Extension Planning Area
ExCo	Executive Council
FAAP	Framework for African Agricultural Productivity
FARA	Forum for Agricultural Research in Africa
GMB	Grain Marketing Board
IAR4D	Integrated Agricultural Research for Development
IARC	International Agricultural Research Centers
IFDC	International Fertilizer Development Cooperation
IITA	International Institute for Tropical Agriculture
ILRI	International Livestock Research institute
INRAN	Institut National de Recherche Agronomique du Niger
INRM	Integrated Natural Resource Management
IP	Innovation Platform
IPG	International Public Good
IPGRI	International Plant Genetic Resources institute
IPR	Intellectual Property Rights
IPSAS	International Public Sector Accounting Standards
ISFM	Integrated Soil Fertility Management
KKM	Kano-Katsina-Maradi PLS
LGA	Local Government Authority
LI	Lead Institution
MC	Management Committee
MP	Mega Program
MTP	Medium-Term Plan
MDTF	Multi-Donor Trust Fund
NAIP	National Agricultural Innovation Project
NARI	National Agricultural Research Institute
NARS	National Agricultural Research Systems

NEPAD	New Partnership for Africa's Development
NGO	Non-Governmental Organization
NGS	Northern Guinea Savannah
NRM	Natural Resource Management
NSF	Networking Support Functions
PC	[Board] Program Sub-committee
PCU	Program Coordination Unit
PLS	Pilot Learning Site
PLT	Pilot Learning Teams
PSC	Program Steering Committee
RCT	Randomized Control Trial
RPG	Regional Public Good
	Southern African Development Community - Food, Agriculture and Natural Resources
SADC/FANR	Directorate
SC	Science Council
SRO	Sub-Regional Organization
SS TF	Sudan Savannah Task Force
SSA-CP	Sub-Saharan Africa Challenge Program
SOFECSA	Soil Fertility Consortium for Southern Africa
TF	Task Force
TSBF	Tropical Soil Biology Fertility Institute
T&V	Training and Visit
WECARD	West and Central African Council for Agricultural Research and Development
ZMM	Zimbabwe- Mozambique- Malawi PLS