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Integrated Agricultural Research for Development (IAR4D)
Revisiting Concepts, Practice and Up-scaling

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Innovating for Africa's Wellbeing

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Foreword

Reflections on IAR4D

At the beginning of the 21st century, several ideas about how agricultural research could better respond to the needs of development came together in what became known as "Integrated Agricultural Research for Development," or IAR4D. Some 8 years ago, FARA commissioned the development of the first "white paper" on IAR4D, to better document and define the concepts behind this new approach. Four "defining principles" which characterized this "new way of doing business" were proposed, the central element being that multi-stakeholder approaches are needed from the start to move from pure research output to real outcome and impact on development, which requires institutional innovations alongside technical and organizational innovations.

Since then, IAR4D has been widely promoted in Africa, and much experience has been gained in putting these ideas into practice. Foremost among these efforts was the Sub-Saharan African Challenge Programme (SSA-CP), which established several multi-stakeholder platforms in each of three regions that serve as "pilot learning sites" in Africa, with the objective of implementing IAR4D. The multi-stakeholders platforms are tagged "Innovation Platforms" (IPs) with the notion that the ultimate outcome of the interactions and business on the platforms would be innovation with broad-based socioeconomic benefits. The IPs thus become an operational framework to implement the IAR4D concept. The outcomes of this work have been amply documented by FARA, which concluded that these approaches do indeed provide for increased impact on the livelihoods of small farmers, effective transfer of technologies, and better returns on investment in research, compared to the linear approaches to "technology generation and transfer."

In addition, there has been a wider debate on the IPs and the important role of facilitators to enable various actors within an agricultural innovation system (AIS) to collaborate and find joint solutions, adapt and respond to emerging challenges. This has been linked to a discussion on the need to strengthen the 'capacity to innovate'.

In 2015, FARA initiated a reflection exercise on the experiences of operationalizing the IAR4D principles as elaborated in the first White Paper. This document, therefore, takes a closer look at the experiences within the SSA-CP learning sites to understand if this way of implementing IAR4D has really led to the fundamental changes hoped for in the way research interfaces with development. Do the four (4) original principles suffice in sustaining the utility of the concept? What other principles are added over the proof of concept phase, based on learning, to ensure the delivery of result? What have been the main challenges in operationalizing the IAR4D concept?

The authors concluded that in all the cases studied, while innovation platforms represented the main tool for IAR4D, there was considerable variation in their purpose, activities and composition. The platforms were intended to combine research and development activities through partnerships and collaboration with different stakeholders at different levels with a strong emphasis on value chain development, technology generation and transfer. The initial focus was on the establishment and running of the platforms – i.e. on the structure and activities towards proving the concept; this was vital, since the concept represents a paradigm shift in the ways things are done in ARD. The platforms later explored ways of bringing about institutional and policy changes in the wider system. As a consequence, the platforms described in the cases serve as a means of disseminating research outputs, as well as articulating demand for research outputs by the end users. In many cases, the role of the researchers has expanded from knowledge generation to brokering, mediating, capacity building and coordinating the platforms—at the inception, this was the case, because the platforms were initiated by research partners. However, in principle, the extra roles get devolved to other partners as the platform matures and local stakeholders develop the capacity to innovate. The mutual learning between stakeholders, emphasized in the original IAR4D principles, is mostly interpreted as farmers' learning – and less as the organizational learning needs to continue to develop research practices beyond the agenda of short-term outputs.

The authors therefore raise a number of interesting questions to spur the continued evolution of IAR4D approaches. Has the emphasis on innovation platforms as a "tool" for implementation of IAR4D allowed and promoted change in the way research is organized? Do researchers have the competencies to broker actors and facilitate innovation? Are researchers even the most suitable group to lead such processes? And if yes how can the required research competency for brokering be strengthened and instituted? Have monitoring and evaluation frameworks evolved beyond conventional measures of technology adoption and farmer income to consider the institutional dimensions of agricultural innovation?

There are no easy answers to these questions. But they surely provide knowledge of issues to be resolved to proffer ways in which research can be transformed to better serve the needs for agricultural development in Africa.

Yemi Akinbamijo, Richard Hawkins and Willem Heemskerk

Acknowledgements

The Forum for Agricultural Research in Africa (FARA) developed the concept of Integrated Agricultural Research for Development (IAR4D) concept in 2004. It implemented the Sub-Saharan African Challenge Programme (SSA CP) from 2007 to 2015 in order to prove the IAR4D concept. In 2008-2009, FARA commissioned a group of experts in agricultural innovation systems approaches to prepare a concept paper to promote discussion around IAR4D, and contribute deeper understanding by actors involved in agricultural research and development. While the concept paper outlined a set of 'good practices' or actions that synergistically add value to existing research and development processes, SSA CP extensively used innovation platforms as the main instrument/ vehicle for operationalizing IAR4D. In the course of setting up the platforms, bringing diverse actors together, facilitating interaction and engagement and identifying themes and problems of common interest, the platforms sought to foster a paradigm shift from technology-oriented to system-oriented agricultural research for development.

The current publication revisits the concept and principles of IAR4D and relates the lessons learnt in a sample of nine innovation platforms across the SSA CP sites. It also looks at the discussions and debates since the publication of the concept paper in 2009 on innovation platforms and the capacity to innovate, identifying those areas that still need to be addressed and open questions in regard to achieving IAR4D objective to transform African agriculture through research. The authors' roles have been to draw out learnings from field practices and question if and how innovation platforms can facilitate the fundamental restructuring of organizing research, supply-chains, policies, management, monitoring and evaluation (M&E) and decision-making processes in the wider context.

We are particularly grateful to the case writers and experts who provided their experiences and analyzed the cases at the writeshop in Nairobi. They not only contributed during the writeshop but were also forthcoming in answering questions via email and skype well after the writeshop. We thank them for their time, energy, and interest.
We are also thankful to Eline Mineboo (KIT) for painstakingly going through each case and preparing summaries. We would also like to thank Richard Hawkins (ICRA), Willem Heemskerk and Mariana Wongstchowski (KIT) for their inputs and constructive comments while putting this publication together.

CHAPTER **01**

Revisiting Concepts, Practice and Up-Scaling

1.0 Introduction

Given the challenges of reducing poverty and feeding a growing global population in the face of an unpredictably changing climate and degrading natural resources, the adoption of research-based and appropriate agricultural knowledge is vital, particularly in Africa, to produce tangible development outcomes and sustainable innovations that impact on the livelihoods of smallholder farmers. At its inception in 2002, the Forum for Agricultural Research in Africa (FARA) recognised that a major constraint to such adoption lay in the complexity of the agricultural system and called for an integrated approach to the resolution of the issues which are as diverse as they are interrelated—for instance, markets, productivity, policy, natural resource management, product development, nutrition, and gender. As interrelated as they are, they have been conventionally treated in isolation as they fall in the domain of different disciplines (Adekunle et al., 2013). The term 'Integrated Agricultural Research for Development (IAR4D),' first coined in 2003, acknowledges the complexity of the agricultural system and the need to bring together not only different related research disciplines but also multiple actors (private sector, public sector, producer organisation and policymakers) to find joint solutions to the challenges of agricultural innovation. [1]

The term became widely popular and two programmes, the Sub-Saharan Africa Challenge Programme (SSA CP) and the Dissemination of New Agricultural Technologies in Africa

[1] Pillar IV of the Comprehensive African Agricultural Development Programme (CAADP) of the African Union echoes this realisation, calling for a paradigm shift away from a principally technological package approach to a truly integrated agricultural research approach and to ensure that researchers (national and international) work together with smallholders, pastoralists, extension agencies, the private sector and NGOs to have impact on the ground.

(DONATA), launched by FARA in 2005 and 2007 respectively, were based on the IAR4D concept. Later discussions within the donor group supporting the SSA CP, notably the World Bank, EC and CGIAR led to the re-orientation of SSA CP towards a proof of concept research. It was in the wake of this reorientation in 2007 that FARA conceived the idea of a "white paper" to enable a much better understanding of the concept. This first white paper, which was to define the concept more closely and identify underlying principles was published in 2009 (Hawkins et al., 2009).

The white paper produced in response traces the evolution of the concept back to its roots in an impressive range of theories and approaches from diverse disciplines, such as constructivism, participatory action research, stakeholder analysis, agricultural knowledge and information systems, systems thinking and multi-stakeholder processes, adult and experiential learning theory, knowledge management, farmer field schools, value chain analysis, social equity and gender frameworks and new institutional economics, among others.

Four underlying principles were articulated to illustrate the processes envisaged (Buruchara, R. et al., 2013):

1

BROADER
WORKING
ALLIANCE

will achieve
desired impact

IAR4D integrates the perspectives, knowledge and actions of different stakeholders around a common theme or 'entry point'. The theme represents a research and development challenge, identified by one or more stakeholders. In identifying the challenge, the stakeholders recognise that a broader working alliance is needed to achieve the desired development impact. The interests and actions of the different stakeholders are diverse, ranging from information and technology to business, politics, policy, finance, organisation and management. It is also assumed that there are existing or potential links among these interests. This principle is supported by constructivism theory, as well as by experiences from indigenous knowledge and farmer innovations, participation and participatory research, stakeholder analysis, and agricultural knowledge and information systems.

2

IAR4D integrates the learning that stakeholders gain from working together. Recognising that all stakeholders in an innovation system have relevant knowledge based on their roles, this knowledge can be shared through interactive learning leading to joint action. In addition to being a concerted action process, IAR4D is therefore also a mutual and interactive learning process, with stakeholders learning from each other and from their joint experience. The theory of adult and experiential learning as well as experiences with knowledge management, action research, farmer field schools, learning cycles and learning alliances all support this principle.

3

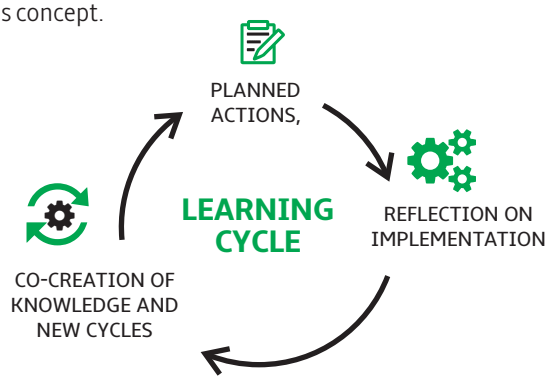
INTERLINKED DIMENSIONS OF DEVELOPMENT

IAR4D integrates analysis, action and change across the different dimensions of development (e.g. environmental, socioeconomic). Concepts of sustainable development and multi-functional agriculture emphasise the interlinked dimensions of development. Such interlinked dimensions include economic growth (linking farmers to markets), conservation of natural resources (soil fertility, biodiversity and limited carbon dioxide production), social inclusion and equity (pro-poor development) and food security. Integrating analysis, action and change across the different dimensions ensures that IAR4D achieves impact in terms of poverty reduction and pro-poor development. The theory of rural livelihoods as well as experiences with INRM, value chains, social equity and gender frameworks, inter-disciplinary research and development, and agricultural development goals all give support to this principle.

4

IAR4D integrates analysis, action and change at different levels of spatial, economic and social organisation. This concept follows the notion of agricultural innovation systems perspective in which agricultural innovation is an emergent property of the broader 'innovation system'. Research is no longer viewed as the sole driver of development, as implied in the 'national agricultural research system' perspective, or even as having a central role, as is implied in the wider 'agricultural knowledge and information system' perspective. The agricultural innovation systems perspective regards research as only one of the sub-processes of a framework encompassing value chain and knowledge and information systems, as well as policies and institutions that determine the interaction between the components.

To effectively stimulate agricultural innovations, IAR4D aims to promote change and enhance learning throughout the innovation system, at multiple levels. These include spatial (field, farm and watershed), economic (product, firm, value chains and business clusters) and social (individual, group, community, organisations and innovation systems) levels. The systems theory and experiences with farming systems research and client-oriented approaches, as well as with integrated rural development, scaling up and out, agriculture sector policies and strategies, and new institutional economics, have all informed this concept.



IAR4D is thus about a continuous, interactive process of social and experiential learning among multiple actors based on a cycle of planned actions, and reflection on their implementation leading to co-creation of knowledge and new cycles of planning, action, reflection, learning and re-planning. This " is fundamental to the IAR4D approach and focuses primarily on the processes of stakeholder interaction themselves, rather than on the specific solutions to research and development challenges. Reflection is particularly crucial in enabling stakeholders become engaged in analysing the outcomes of their own behaviour and processes in which they are involved, as well as questioning their assumptions about other stakeholders and change processes.

Indeed it is the change in mind-sets, attitudes and behaviours that is the focus of IAR4D, which implies a fundamental shift:

- → from seeing knowledge generation as the final objective, to seeing it as a means to achieving change; from research to innovation; from focus on technology to that on people;
- → from mainly reductionist understanding of the parts to systemic understanding of the relationships between the parts;
- → from mainly 'hard systems analysis' (improving the mechanics of the system) to

also 'soft systems analysis' (negotiating the meaning of the system and desirable transformations);

- from seeing participation as a matter of consulting beneficiaries to one of facilitating engagement for interactive learning between stakeholders, resulting in joint analysis, planning, and collective action;
- from working individually to working with others, in ever-changing ad-hoc teams and partnerships;
- from teaching to learning; from being taught to learning how to learn; from individual learning to social learning;
- in the culture of R&D organisations, from an exclusive focus on individual merit and competition to one that also favours collaboration and teamwork within and between organisations; and
- from agricultural research systems to agricultural innovation systems.

The white paper explains IAR4D as being about a set of 'good practice' or actions that synergistically add value to existing research and development processes, stressing that IAR4D should not be understood as an approach or framework, or even a process, but being much more *'about the (quality of the) processes'*. The processes aimed at improving behaviour and capacities as outcomes rather than on achieving technology and policy *outputs*.

Learning takes place at individual, organisational and institutional levels. At the individual level, participants become aware of how their own personalities, attitudes and mind-sets affect their interaction with others. At the organisational level, group members of an organisation collectively learn how their administrative and management practices and incentive structures, etc. affect or limit the interactions between individuals within the organisation and between the organisation and other stakeholders. At the institutional level, individuals and organisations collectively learn how they can interact to facilitate innovation. They learn how to collectively create an enabling environment that encourages interactions, and how to share information and manage knowledge across networks. (Buruchara, R. et al., 2013)

To facilitate interaction and learning, neutral intermediaries are seen as crucial in building trust among various stakeholders. The authors, however, did not dwell on the role and capacity strengthening needs of such intermediaries, but only pointed out their roles in terms of communication and partnership development. The role of intermediaries was to become a key focus of approaches to implement the IAR4D principles.

Capacity strengthening, understood as an iterative process (as opposed to one off training event), is central to the concept of IAR4D. It enhances interaction, builds trust and creates synergy between research institutions and public and private sector actors, smallholder farmers and development organizations to enable them to address a whole range of activities, investments and policies and avail them opportunities to make changes. Capacity strengthening needs to take place concomitantly at individual, organisational and institutional levels in an integrated fashion, as each level influences the other –

"the strength of each depending on, and determining the strength of the others" (UNDP, 2011).

At individual level, competencies, such as meta-discipline (systems thinking, knowledge management, strategic planning, knowing how to learn, effective writing, and use of information and communications technologies), social skills (communication, teamwork, networking and facilitation) and mind-sets (empathy, self-awareness, self-regulation, self-motivation and social awareness) are required. At organisational level, structures and processes need to provide the performance and incentives systems that encourage inter-disciplinary teamwork, partnerships with other stakeholders, an emphasis on mutual learning, and effective knowledge management that combines work to promote change. Also needed are approaches to impact assessment that go beyond economic returns to include and encourage a broader view of human development. At institutional or system-wide level, capacity needs to be developed to allow different stakeholders (individuals and organisations from the public and private sectors) to come together on a level playing field.

Overall, IAR4D is presented as a set of 'good practice' or actions that synergistically add value to existing research and development processes. IAR4D is neither an approach, a framework, nor a process—it is much more '*about the (quality of the) processes*' focussing on improving behaviour and capacities as outcomes rather than on achieving technology and policy outputs. IAR4D is presented as a "boundary" activity, as it does not 'sit' squarely within the mandate of any particular organisation (research, extension, farmer's organization or

agribusiness); rather, each organisation is called upon to devote efforts and resources to link with others, taking a lead in stakeholder partnerships where needed.

The failure to fully comprehend the nuanced interpretation of IAR4D poses the risk of a too simplistic or mechanistic implementation of the principles through a set of actions. More important than implementing activities is the focus on creating and continually developing individual competencies, organizational norms and culture and the conditions and mechanisms for inter-institutional linkages. Failing to address all three dimensions of capacity (individual, organisational and institutional) in an integrated manner and, above all, jumping to action before creating the enabling conditions at organisational and institutional levels may reduce the level of collective achievement.

In conclusion, the authors of this white paper admit that the interpretation of IAR4D has been deliberately wide, reiterating that

without a consideration of the individual, organizational and, above all, inter-institutional factors that provide the basis for IAR4D, we will continually fail to achieve the multi-faceted, sustainable, pro-poor development that Africa desires and deserves.

This wide interpretation and the potentially all-encompassing character of IAR4D have been the most challenging for practitioners. However, FARA at this moment, with experience of ten years of fieldwork and having worked with about five hundred Innovation Platforms, is in a vantage position to illuminate on the concept and, most importantly, how practitioners can best address it.

This book summarizes the multifarious experiences garnered across all the Innovation Platforms that were established under the Sub-Saharan Challenge Program, and analyses them through the lenses of our initial understanding of the concept. This was done with a view to understanding the veracity, validity and ease of application of the original set of principles, on the one hand, and identifying if there were other principles that were important for the derivation of successful outcomes, on the other.

CHAPTER **02**

Overview of SSA CP (2004 -2014)

2.1 Origin of the SSA CP Program

Around the year 2000, it was apparent that new approaches to development in Africa were needed to foster the desired change in people's quality of life. The several initiatives established included the New Partnership for Africa's Development (NEPAD) and the development of the Comprehensive Africa Agricultural Development Programme (CAADP) with the aim of "helping African countries reach a higher path of economic growth through agriculture-led development, which eliminates hunger, reduces poverty and food insecurity, and enables expansion of exports." In 2001, the Forum for Agricultural Research in Africa (FARA), along with its three-component sub-regional organizations (SROs) (now four, with the emergence of North African Sub-Regional Organization (NASRO) for North Africa) and the CGIAR centres, issued *The Durban Statement,* calling upon the international agricultural research system, including the CGIAR centres and advanced research institutions, to develop efficient partnerships with the national system organizations in Africa in order to achieve programmatic integration. To kick-start this process, a workshop focused on new ways of conducting agricultural research was organized in 2003 to set the stage for the Sub-Saharan Africa Challenge Programme (SSA CP). At this time, FARA and SROs endorsed a target of 6%

2003
WORKSHOP ON THE DURBAN STATEMENT

FARA & SROS VALIDATED

6% **TARGETED ANNUAL GROWTH**

TO REVERSE THE DECLINE IN FOOD PRODUCTION & INCOMES OF THE RURAL POOR IN AFRICA

annual growth in agricultural productivity in African countries in order to rapidly reverse the decline in food production and incomes of the rural poor.

To achieve this target, the region needed

1 

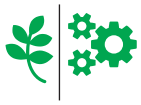
dynamic agricultural markets among nations and between regions;

2 

to become a net exporter of agricultural products;

3 

to have food available and affordable, with equitable distribution of wealth;

4 

to be a strategic player in agricultural science and technology generation; and

5 

to develop a culture to use natural resources sustainably.

Consequently, there was an extensive consultation, involving more than 100 scientists from research institutions in Africa and other parts of the world followed. They identified **four major areas** that needed immediate attention

- **a** low productivity of agricultural production systems,
- **b** failures of agricultural markets,
- **c** inappropriate policies, and
- **d** natural resource degradation.

This called for a different approach to agricultural research and development, as these were issues that were not only technological in nature but also institutional and organisational. The outcome was a framework combining research agendas with developmental ones for the derivation of socioeconomic outcomes – the Integrated Agricultural Research for Development (IAR4D). IAR4D provided the basis for conducting research in a manner that integrates different thematic issues, recognizing their interdependence and using a combination of hard and soft sciences to provide solutions through multidisciplinary and multiple stakeholder interaction. IAR4D fostered the agricultural innovation process through:

- A set of principles, elaborated in the White Paper, for conducting research for development that squarely addressed the complexity and heterogeneity of farming systems in sub-Saharan Africa;

- A new research agenda that recognized the necessity for an integrated approach to research and the interaction between natural resource management, production systems, and agricultural markets and policies;

- Institutional change to forge new partnerships, involving all stakeholders, especially smallholders and pastoralists, women as well as men; to address the issue of food production while maintaining the resource base of agriculture for future generations.

Following the conclusions of this workshop, FARA and its partners developed the ideas generated into a research and development proposal seeking interested donors for partnership on how to spread the new concept across Africa.

2.2 The Sub Saharan Africa Challenge Program

This period coincided with a dispensation of a number of interesting developments within the global agricultural research and development family. Donors were becoming increasingly restive and dissatisfied with a plethora of research outputs that never led to outcomes or impacts and were challenging stakeholders to embrace reforms to modify the balance. CGIAR, as an institution, responded by proposing the concept of Challenge Programmes which were meant to experiment with new approaches for expanding research partnerships for the dual purposes of diversifying sources of funding for CGIAR and increasing impact. FARA and its partners saw this as an opening and took advantage to package the concept of IAR4D and proposed it as the Sub Saharan Africa Challenge Programme (SSA CP). Thus, the Sub Saharan Africa Challenge Programme (SSA CP) was developed by agricultural research and development partners in Africa under the leadership of FARA to operationalise the IAR4D concept across the continent. The proposal was first conceived as an ambitious programme aimed at spreading the concept across Africa, but later interaction with the then Science Council (now Independent Science and Partnership Council) forced FARA to reduce the scope to only eight pilot countries in Africa.

In order to deliver a coherent output and outcome, SSA CP focused on addressing four interrelated themes:

I development of technologies for sustainably intensifying subsistence oriented farming systems;

II development of smallholder production systems compatible with sound natural resource management;

III improving accessibility and efficiency of markets for smallholder and pastoral products; and

IV formulation of enabling policies to encourage innovation improving the livelihoods of smallholders and pastoralists concurrently.

Research projects in SSA CP had several common characteristics, with respect to the scientific components targeted for the removal of local constraints, research agendas driven by local problems, demand-driven projects implemented by multidisciplinary and multi-institutional teams, sharing of information and knowledge of IAR4D processes, outcomes and collective goals aimed at developing innovative solutions to problems.

Implementation of SSA CP drew lessons from the failure of the reductionist approach to the development of African agriculture and embraced systems thinking, where the components of the system are regarded as having equal importance and the interactions between the components are as important as the components themselves. SSA CP projects and, consequently, research agendas were formulated using participatory processes involving multiple stakeholders, and choosing entry points linked to priority issues. These entry points were then used to further explore the full dimensions of the issues across the agricultural production system and to develop solutions for sustainable livelihood. SSA CP was carried out by multidisciplinary, multi-organisation teams working in different Pilot Learning Sites (PLSs). These PLSs were carefully chosen by Africa's sub-regional research organizations (CORAF/WECARD, ASARECA and SADC/FANR) on the basis of two criteria, namely

1 the extent of **potential benefits** to **local, national and regional development**, and

2 the **representative nature of sites,** in order to help extrapolate lessons learned to other locations.

Research at the PLSs was organized such that results could be scaled out to other communities and up-scaled from local through national, to regional level. SSA CP implementation sought to find a balance between solutions tailored to local contexts and extrapolation of insights to other settings. This had implications for information dissemination and capacity development.

2.3 SSA CP and research for the Proof of IAR4D Concept

In September 2004, the CGIAR Science Council accepted the SSA CP proposal and granted an eighteen month inception phase. Thereafter in 2006, it commissioned an external review of the inception phase that recommended that 'SSA CP be allowed to continue for a three-year period during which the proof of the IAR4D concept would be established and appropriate lessons learnt and International Public Goods (IPGs) derived from the research and development activities shared. The implementation phase would occur only at the current three PLSs, and adequate funding channelled to allow this continuation in a manner that avoids the possibility of fatigue and fragmentation of the newly formed and still delicate partnerships.'[2] Through the review, SSA CP was challenged to embark on a proof of concept research study using scientifically rigorous methodology to provide answers to three basic questions as follows:

A Does the IAR4D concept work and can it generate International Public Goods (IPGs) and Regional Public Goods (RPGs) to end users?

B 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)?

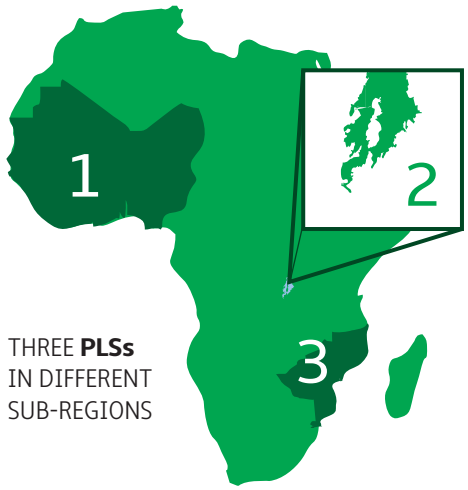
C How sustainable and usable is the IAR4D approach outside its test environment, that is, concerning its scaling out for broader impact?

Several stakeholders and partners of FARA considered this request as improper. They argued that it was the first time in history that any new approach will be so treated, citing the anxious acceptance of the farming system approach before it without any precondition of proof of efficacy. Besides, the request was asking FARA to conduct an impact study in three years, which is considered a short framework for such studies, especially when development of technologies are involved; use scientifically rigorous methodology and do all these for an approach that did not have a regular framework. SSA CP was the first donor-funded programme of the then inchoate FARA and this could have

[2] At the end of the three years, the Science Council commissioned another review to determine whether the IAR4D concept worked and was able to generate deliverable IPGs and whether the SSA-CP should merit continued endorsement by the SC and CGIAR. Once valuable lessons were learnt and the IAR4D concept proven, additional sites could be logically added and scaling-up and out, could be done"(Lynam et al; 2010)

made FARA and a vibrant core of its stakeholders to perceive the programme as a test of FARA's readiness for leadership on the continent. This was, more so, as the international community for research and development had just conceded the relocation of FARA to Africa. For these reasons, SSA CP was more than an ordinary research and development programme. After weighing all options, SSA CP embarked on a process to develop a rigorous methodology that would be accepted by the CGIAR Science Council. In response to the demand by the Council for a scientifically rigorous methodology, the research plan focused on testing the effectiveness of IAR4D by imposing a randomized control design (RCT) on the implementation of IAR4D. The methodology was elaborated in the SSA CP Medium Term Operational Plan (MTP) submitted to the CGIAR Science Council, and addressed the three main research questions as requested by the Council. To effectively provide answers to the questions, the methodology involved the use of two types of counterfactuals. These were the villages with conventional approaches and those with neither IAR4D nor conventional practices, which were termed "clean villages". With data collection method that was planned as baseline, midline and endline during the project life, this allowed for the benefit of "before and after" and "with and without" calculation of differences in the chosen parameters.

Furthermore, SSACP adopted Innovation Platforms as the framework for the implementation of IAR4D. SSA CP's research centred on the evaluation of IAR4D, with reference to the processes and benefits, as compared to conventional approaches to technology generation and dissemination. The research was coordinated by FARA and carried out in the three PLSs in different sub-regions by the SROs viz., CORAF, ASARECA and CCARDESA (now replacing SADC/FANR). The three PLSs were:



THREE **PLSs** IN DIFFERENT SUB-REGIONS

1 **Kano –Katsina- Maradi**: This is representative of the vast savannah that cuts across West Africa

2 **Lake Kivu** (Uganda-Rwanda-DRC): Covering the ecologies around Lake Kivu and

3 **Zimbabwe-Mozambique and Malawi**, representing the vast ecology in southern Africa

Activities of the task force institutions were centred on the selected 8 countries viz., Nigeria, Niger, Uganda, Rwanda, Democratic Republic of Congo, Mozambique, Malawi and Zimbabwe.

Task force institutions were selected by a competitive grant process.
The hypothesis for each research question is given in Table 1.

Table 1 Hypothesis for the Proof of Concept research

Research Question	Hypothesis
Does the IAR4D concept work and can it generate International Public Goods (IPGs) and Regional Public Goods (RPGs) to end users?	**H1:** An Innovation Platform created and functional with the 5 components characterizing IAR4D will lead to increased interactions among partners, among farm households in communities and better developmental outcomes (where IPs are in operation compared to communities where IAR4D is not in operation)
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)?	**H2:** IAR4D delivers more benefits to end users and communities compared to conventional approaches (if the conventional ARD approaches have access to the same resources).
How sustainable and usable is the IAR4D approach outside its test environment, that is, concerning its scaling out for broader impact?	**H3:** If IAR4D works in the different PLS contexts then the lessons learnt/insights can be extrapolated outside the test environments.

Responses after **Task force institutions** inputs

4 IPs IN PARTNERSHIP WITH STAKEHOLDERS

36 IPs IN RESEARCH PROGRAMME

IAR4D CONCEPT IN OPERATION

The task force institutions engaged stakeholders in a partnership that established four innovation platforms each and operationalized the IAR4D concept. A total of 36 IPs were set up in the research programme. The partnership structure provided for backstopping of the PLSs and the task forces in specialized discipline areas, such as monitoring and evaluation, impact assessment, biometrics, data management and econometrics. A cross-site research support team was set up to provide this support, as demanded by the research implementation team. The different task forces implemented activities on the innovation platform as an independent replicate of the experiment and data from the baseline and end line were collected and analysed using a variety of econometric methods. The inferences were presented and documented as the proof of IAR4D concept. The timeline and milestones for the proof of concept research are given in Annex 1

Research on the implementation of the IAR4D concept attempted to develop an effective framework based on the innovation systems approach to ensure that research outcomes lead to measurable developmental impact. Innovation platforms, virtual, physical, or virtual cum physical were seen as an effective space for different stakeholders to come together to identify problems, source and implement solution options and learn from the process. SSA CP finalized the proof of the IAR4D concept with empirical evidence that the concept delivers more benefits than conventional approaches utilizing fewer resources; and that it also has the potential to help smallholder farmers earn greater incomes and move from subsistence scale to small and medium-scale business farmers. Furthermore, evidence showed that the concept encouraged the private sector and grew businesses along the value chain.

CHAPTER **03**

Operationalizing the IAR4D Principles:

Evidence from SSA CP cases

This chapter looks at **nine case studies** from SSA CP in order to understand how they were able and to what extent they were able to operationalize the four defining principles of IAR4D. Using the pointers given in the first White Paper, this chapter aims at identifying the practical ways in which these principles have been reflected in research and development practices, to appreciate the challenges faced by implementers and to suggest ways of incorporating the principles in future work. For each principle, it starts with a brief explanation, followed by a list of probable actions that might contribute to the principle, with examples of actions reported in the SSA CP case studies. It concludes with some reflections on how the principles have been and could be further incorporated into development practices, as well as a more general discussion on the challenges and implications of embracing this approach.

3.1 Analytical questions

As set out in the introduction, the first White paper provided a framework for understanding the concept of IAR4D. It emphasized the need to go beyond methods to include changes in individual skills and mind-sets, organizational cultures and capabilities, and the patterns of interaction between organisations as part of the wider agricultural innovation system. Each section explains the meaning of each principle, the theories and experiences that support the principles and also indicates the practical ways in which the principles can be reflected in research and development practices. The analytical questions below derived from the latter help assess actions taken to contribute to operationalizing the IAR4D principles in various project locations.

Principle 1:

Integration of perspectives, knowledge and actions of different stakeholders around a common theme.

This principle refers to creating a common understanding of the development problem/ challenge at hand, and establishing joint/shared objectives for concerted action within multi-stakeholder partnerships.

- How were partnerships organised?
- How were working procedures and conflict resolution mechanisms set up? Were new forms of organisations created to manage stakeholder interaction?
- Was any staff appointed to facilitate interaction among stakeholders and/or to manage the platforms?
- Which research and development activities were initiated in response to the need for innovation identified by stakeholders?
- Did the stakeholders formulate any work plans to work together - describe the processes where stakeholders jointly agreed on action plans, roles and responsibilities?
- How was progress on research endeavours communicated to stakeholders?
- Did the participating organisations designate contact persons to provide information about the progress of this research?
- Were there differences in perceptions, knowledge, interests and power between stakeholders? How were they handled?
- Were any policies formulated at the local or national level to address needs and priorities identified multi-stakeholder interaction?
- Were any research proposals and/or projects developed by stakeholder partnerships?
- How did stakeholders lobby for funding for other stakeholders' projects?
- How were public private partnerships formalized?
- What incentive structures were set up to encourage linkages with other stakeholders?

Principle 2:

Integration of learning that stakeholders achieve through working together.

This principle looks at IAR4D as a mutual learning process where the stakeholders go beyond concerted actions and learn from each other as well as from their joint experience of working together.

- Describe any spaces, events created for staff to reflect on and exchange experiences, formally and/or informally?
- Describe the processes introduced to accommodate new learning/ good practices in projects?
- How were M&E procedures designed to encourage learning?
- Were there opportunities to facilitate dialog within and between projects?
- How were opinions about personal and inter-organisational relationships documented?
- What knowledge management mechanisms existed in organisations?
- Did staff have opportunities to exchange information with other staff and/or other organisations?
- How were participatory research practices and processes used?

Principle 3:

Integration of analysis, action and change across the development dimension.

This principle points to the contribution of IAR4D to broader development issues that go beyond agricultural development and affect livelihoods at household level as well as policy and institutional aspects, such as integrated natural resources management, value chains, gender and equity issues and larger goals of agricultural development.

- What was the nature of action plans? Are they integrated i.e. going beyond economic growth (including social, environmental aspects)?
- How were professionals organized (broad inter-disciplinary teams?) to address broader developmental issues?
- How were impacts beyond economic returns assessed?

Principle 4:

Integration of analysis, action and change at different levels of spatial and social organization

The 4th principle suggests that IAR4D needs to be cognizant of the wider system in order to enhance learning between and across actors at different levels viz. spatial, economic and social, within the system.

- Any new (forms of) social organisations formed at different systemic levels? What kind of partnerships/ linkages have been established between local and national/ regional organisations?
- Has any staff been seconded to/from other organisations to fill in expertise gaps?
- How were needs of different geographical areas, agro-eco zones, value chains identified? And how are they addressed?
- Any development of coherent/ integrated policy changes?
- What was done to scale up/ scale out (adaptation of) innovations (independent of projects)?
- What measures were taken to improve support services to all actors in value chains or partnerships?

Principle 1:
Integration of perspectives, knowledge and actions of different stakeholders around a common theme

Most cases reported that partnerships were organized around common themes identified through processes akin to community consultation using PRA tools, including stakeholder analysis. Some project holders, like CIAT in Balaka IP, carried out community characterization and IP characterization exercises, while others carried out community analysis processes to identify specific developmental issues and to shortlist relevant stakeholders in consultation with the communities. The initial configuration of stakeholders was decided by the project holders, who in most cases were research organisations. Their decision was based on their preliminary understanding of the problem and of who, according to them, could contribute to its solution and help change the farmers' situation. As newer issues were identified, more actors were invited to join the platform, while some of the earlier stakeholders withdrew because they did not find the issues at hand relevant to them. Most IP members came from within the precincts of

the IPs; there were other members as well. Some IPs, like the Maendeleo Bean IP, also had satellite IPs or branches at the village level. All cases evidenced that the researchers made efforts to bring in diverse development actors who could contribute to value chain development to improve smallholder farmers' livelihoods. Typically, the themes centred on specific commodity-based value chains, e.g. beans (Maendeleo IP, DRC), indigenous vegetables, such as amaranthus, okra (Thyolo, Malawi), maize-legumes (Nigerian Guinea savannah), tomatoes (Kaduna, Nigeria), and rice (Dandume, Nigeria). This made interaction between the various stakeholders practical and action-oriented. As the interactions evolved, the themes got more refined (from improving productivity of sorghum to revising cooperative bye-laws in Bubare, Uganda) – in most cases, the emphasis shifted from productivity enhancement to arranging for input supply, to market linkages.

With reference to initial working procedures, the project holders/ research organisations appointed coordinators to facilitate and coordinate different activities carried out by the IP (eg, rice IP, Nigeria). Thereafter, almost all IPs formalized their interactions by electing an executive management committee with the following roles – a president, vice president (sometimes two), secretary, treasurer, a number of advisors and, wherever applicable, a representative of each branch. In the rice IP, for example, there was a six-member management committee and the chairman was elected from the rice groups in each of the 9 villages; additionally, there were representatives from research, the government extension agency, and private sector input suppliers. In some cases, the partnerships followed a set of jointly agreed guidelines on how to manage stakeholder interaction and work with one another, how to deal with differences, inaction from partners and so on (Conservation Agriculture IP, Balaka IP, Rice IP). In another case (NRM IP-Bufundi), the IP members selected one of the member organizations to manage the IP. In the early stages, the research organisation played the role of convenor or facilitator of meetings. With time, as stakeholder participation became more emancipated and activities gained momentum, the facilitation role was taken up by rotation. The role of facilitator was to maintain linkages between various levels within the IP and to promote joint learning through feedback loops within communities (Balaka IP). Farmers who were thus treated as beneficiaries – recipients of knowledge –by virtue of being members of the IPs realized that they could play a larger role in decision-making regarding choice of solutions. Another interesting example of formalizing the activities of the IP was in Bubare IP, where the IP had been registered as a multipurpose cooperative society to ensure market access.

Principle 2:
Integration of learning that stakeholders achieve through working together

Most case writers acknowledged regular, face-to-face meetings as an important opportunity for dialogue between stakeholders. They saw these meetings as useful means of reaching out to farmers via their representatives. Minutes of the meetings were used to follow up on decisions taken. Typically, discussions centred on activities done during the month, plans for the following month, and technical backstopping support expected from researchers and other partners, as applicable. Periodic training on a myriad technical and non-technical topic was reported as another significant tool for imparting information. In most cases, recipients of the training were farmers, and the topics ranged from financial literacy, record keeping, and link to banks (Bubare-Uganda), to soybean cultivation (Maendeleo), manufacture and use of energy efficient stoves, banana processing, vegetable cultivation (Bufundi-Uganda, Mulidadi-Malawi), milk production and marketing (Mudende-Rwanda). Some other IPs organized exchange visits for farmers to learn from each other; there were also end of season field days where farmers shared the results of learning with researchers and other stakeholders. Besides regular meetings, some IPs used innovative mechanisms for sharing information among stakeholders. For instance, the Balaka IP sent out letters to farmer parents via the pupils, to inform them about IP meetings; others organized district level workshops for joint problem diagnosis, planning and reflection and national workshops to share the IP experience.

Several IPs reported action research as one of the main activities undertaken to assess needs of the communities that led to newer problem areas for the IP to focus on. For example, in Bufundi, action research indicated that more attention was needed for include youth and women-headed households in IP activities. It also pointed out that NRM activities be linked to enterprise development for commodities with market potential. In the Maendeleo bean IP, action research was used to test out the technical package of practices with reference to bean varieties, spacing intervals, intercropping, fertiliser regimes, as well as soil conservation measures. The Rice IP established researcher-managed trials on farmers' fields to test different technology options, such as weed management, contour ridging, and planting methods to improve rice productivity. Learning through action research has equipped farmers to adjust the options and respond to changes. The Balaka IP used Participatory Learning and Action Research methods to facilitate feedback, learning and reflection among different stakeholders.

Most of the activities mentioned above can be categorized under knowledge management based on the premise that they promoted knowledge sharing between

individuals and organisations in order to enhance their performance, and the performance of their teams and partners. Also, most of the knowledge shared was explicit knowledge, and the IPs allocated dedicated time and space for interaction and sharing among stakeholders. However, there was no mention in the cases of mechanisms to facilitate the making and sharing of explicit tacit knowledge at the organizational level or of specific knowledge management procedures put in place among participating organisations within the cases studied. As most of the IPs were located in the field, they had limited opportunities to interact with other projects and share learning with others within the organization. Nonetheless, case writers mentioned that the projects had adequate support from senior officials within the organization who took time out to attend meetings at various levels, especially regional meetings for planning and monitoring. Some IPs were able to mobilise support in the form of infrastructure from local governments –Bubare IP signed MoU with the sub-county authorities to make use of government storage facilities for sorghum.

In all, SSA CP was seen as an opportunity for teams to try out new ways of working and improving their performance. Additionally, FARA organized several events to sample the learning experiences from the project.

Principle 3:
Integration of analysis, action and change across the development dimension

The SSA CP cases acknowledged the need for additional actions that go beyond food production and encourage development of an entrepreneurial culture among rural producers. They also recognised that strengthening value chains is only one of the many interventions in improving the livelihoods of smallholder farmers. Although some of the IPs in the present study were formed to address issues of soil fertility decline (maize-legume IP) and/ or natural resource management (Bufundi and Bubare IPs), most IPs eventually sought to revitalize value chains dealing with commodities responsive to value addition through processing, and with market potential for diverse utilization. Several IPs followed an agribusiness approach to strengthen both input supply chains and market value chains. For instance, the Bubare IP took on the task of improving the sorghum value chain by sharing storage to bulk the sorghum, and establishing market linkages with a baby home to promote sorghum flour as breakfast food for children; some other IPs intervened in the input supply chain by evaluating fertilizer options (rice IP-Nigeria), repackaging fertilisers into smaller and more affordable quantities (Balaka

IP), creating greenhouses for incubating potato tubers (Mudende IP) and getting an agro-dealer to package all necessary inputs for tomatoes into a single kit to meet farmer's needs (Thyolo IP). In terms of market linkages, the IPs worked towards creating infrastructure for milk processing (Mudende IP), evaluating small-scale dryers for sun-dried tomatoes to capitalize on demand from restaurants (vegetable IP-Nigeria), and producing organic manure for sale.

The IPs, explicitly recognising the need for addressing social equity wherever possible, undertook an engendered participatory assessment of constraints and opportunities for enhancing the livelihoods of men and women in the project communities (the rice IP in Nigeria). They found that women were more constrained by socio-cultural factors and poor access to productive inputs, which in turn reduced their participation in field crop production. Some cases, in spite of being limited by prevalent cultural barriers, took the initiatives to integrate gender (e.g., inducting women in IP management committees, and getting men to help the women in farm operations). Most of this was achieved through sensitization and training of all actors to become aware of gender disparities (Maendeleo-DRC). Other IPs did not report any systematic gender analysis to understand the power dynamics and gender relations within their project areas.

With respect to operationalizing Principle 3, the IPs tried to include a mix of activities that ensured inclusion of and economic benefits to disadvantaged groups within the producer community. The stakeholders also developed joint action plans that focused on natural resource management (NRM) activities and institutionalized them; for example, creating conditions that helped communities adopt NRM byelaws and construct conservation structures to improve water availability in the longer term (Bufundi-Uganda). Overall, the IPs aimed at improving profitability and competitiveness of the value chains by creating a win-win situation for different stakeholders. Not only did the producers benefit but also the input suppliers gained captive markets for their products, credit institutions met their loan targets, researchers got feedback on their research outputs and research results were utilized with due testing of the package of practices per new variety.

Principle 4:
Integration of analysis, action and change at different levels of spatial and social organizations

The cases demonstrated that as project activities became more complex, the IPs endeavoured to include more and varied stakeholders in order to link local innovations to specific market demands. In Uganda, for instance, the Bubare IP developed linkages with private sector food processors to understand requirements of the market with reference to preferred packaging, quantities and the quality of sorghum suitable for processing.

The Maendeleo bean IP was an example, where collective action was initiated through self-help groups or common interest groups to spearhead input procurement and marketing of beans. In the case of the rice IP in Nigeria, collective action resulted in business opportunities for private seed companies and farmers getting quality seed on time. The IP also pressured the local government to release input subsidies in time to buy machines and support rice intensification. Some case studies focused on the role of policy support at the local government level as well. In Nigeria's maize-legume IP, scaling out maize-soybean and maize-cowpea production systems took place under a negotiated agreement between the farmers' organization and local government extension service. In the case of Thyolo IP, government support to local innovation in the form of infrastructure development, such as road networks and small-scale irrigation, encouraged farmers to invest more in vegetable cultivation and expand their area of production. The same was seen in Mudende, where the IP acquired government infrastructure, like a milk collection centre and greenhouse for the benefit of producers in the sector. In Malawi, the Balaka IP was instrumental in incorporating the multi-stakeholder approach in the extension policy under the national agriculture sector-wide approach programme. Likewise, the Rwanda Agriculture Board adopted multi-stakeholder platforms as a means of generating and transferring research outputs to end users at the national level.

4.2 Conclusions

The cases reiterated that Innovation Platforms aim to strengthen IAR4D by providing a forum to facilitate collaborative interactions between diverse actors and stakeholders in agricultural innovation systems. With systematic facilitation, the platforms can foster learning, interdependence and concerted actions towards problem-solving at different levels. For example, in Bufundi and Balaka, multi-stakeholder groups were formed at different levels of administration and interacted with one another at different times. In some other cases, local level farmer groups (either existing or formed in course of the project) referred to as IPs, interacted with multi-stakeholder platforms consisting of diverse actors at the district level. Furthermore, it appears that in some cases, the SSA CP project assisted the process of incorporating IPs as cooperatives and/or farmer organisations (the Bubare case). This suggests that there are different interpretations of Innovation Platforms in practice.

While interpreting, or applying the four principles, the cases did well to identify common themes or entry point activities. In most cases, the entry point activities selected were initiated in response to a need for innovation and also those that required collaboration among research and development actors. With reference to the themes, all cases inevitably referred to value chain development. Even in a case like Bufundi, whose entry point was addressing soil fertility and conservation issues, the activities eventually focused on improving the beans and potato value chains; reinforcing that problem identification, prioritising and seeking solutions jointly were dynamic and ongoing processes. The IPs studied were seen experimenting with socio-technical solutions rather than technical research options alone. They were establishing new institutional arrangements, building trust and capacities of stakeholders to make use of opportunities in the environment for joint action and learning.

It is difficult to say if the project was able to create a learning culture within the participating organisations in terms of creating spaces to reflect and document learning from the project beyond regular project management/ monitoring meetings. Learning regarding effectiveness of working in multi-stakeholder platforms appears to be restricted to the level of each stakeholder completing their tasks at the IP level and remains largely anecdotal. Most of the actions and activities took place at the operational level (for example, meetings and training programmes) and there were no changes reported in organizational mandates, M&E systems, policies and other programmes governed by the research organisations. This indicates a need for strengthening capacities to facilitate learning for IAR4D. Learning as a result of interaction with farmers that might have taken place within research organisations was

mentioned. In some of the cases, changes made by researchers and other stakeholders in their way of working – where they adopted new procedures – were mentioned as 'side effects' or incidentals. Therefore, although learning took place due to stakeholder interaction, the cases did not acknowledge it explicitly.

In essence, the 'different dimensions' in Principle 3 meant that innovation ought to achieve and be evaluated on the basis of other criteria such as social equity, change in power relations, and going beyond productivity increase and/or economic returns to address sustainable use of natural resources. The cases referred to changes in relations between men and women in the project area, but in an anecdotal manner. The Bufundi case addressed natural resource conservation but did not report the environmental impact in quantitative terms. Nonetheless it is evident from the cases that research is not the prime driver of innovation. In fact, as the IPs mature, research is increasingly seen as only one of the actors in the agricultural innovation process encompassing value chains, knowledge management and learning, and institutional processes that determine interaction between all stakeholders and components of the system. As mentioned in some of the cases, institutional change, along with technological change, is a key aspect of innovation in practice, such as farmer organisation, input/marketing channels and policy changes at local/ district level.

Lastly, Principle 4 –the integration of analysis, action and change at different levels – is clearly evidenced through the cases with innovation taking place with simultaneous changes at field, farm, village, district, national, regional and even international levels. Some cases evidenced engagement of the IAR4D process with policies at the national level and incorporating 'good practices' into agricultural extension strategies and programmes. For now, this is more about replication of IPs; it could be considered as a first step towards scaling of IAR4D processes and practices. There is the need, however, to present proper analysis and recommendations that can lead to evidence-based policymaking.

3.3 Cases Overview

Sr	Case Title	Country	Author
1	Natural Resource Management (NRM), Bufundi IP, Uganda	Uganda	Kalibwana R, J Twabaze MM Tenywa, SO Nyamwaro and RA Buruchara
2	Infrastructural Innovations / Multipurpose IP Uganda	Uganda	Twabaze J, R Kalibwana , MM Tenywa, SO Nyamwaro and RA Buruchara
3	Maendeleo Bean IP, Democratic Republic of Congo (DRC)	Democratic Republic of Congo	Nyamwaro, SO., Buruchara, RA., Tenywa, MM., Mogabo, J., Kalibwani, R., Twabaze, J., Ramazani, M., Muke, A., Karume., K., Mandefu, P., Bikuba, GB., Mufungizi, C.
4	Conservation Agriculture and Food Security IP in Malawi	Malawi	Nelson Mango
5	Thyolo Vegetable IP in Malawi	Malawi	Malidadi C and T Chilanga
6	Maize-Legume IP of the Nigerian Guinea Savannah	Nigeria	Ishaku Amapu
7	Vegetable IP, Tomato Irrigation in Northern Nigeria	Nigeria	Hassan M.B., R. Yahaya, A. Abdulrahman, I.Y. Amapu
8	Rice Innovation Platform in Nigeria	Nigeria	Christogonus Daudu
9	Mudende Innovation Platform in Rwanda	Rwanda	Josaphat Mugabo

CASE 1

Natural Resource Management (NRM), Bufundi IP, *Uganda*

by Kalibwana R, J Twabaze MM Tenywa, SO Nyamwaro and RA Buruchara

Context

Since the introduction of the Decentralization Policy of 1995, Uganda has a decentralized system of governance. This policy allows local governments at the district level to contextualise ordinances and bye-laws to their respective areas. The intensively cultivated and densely populated south-western highlands of Uganda are characterized by a fragile agro-ecology and a large variety of land uses and users. The highlands are experiencing land degradation mostly due to water erosion. Therefore, concern for soil and water conservation is paramount for any production enhancement activity in the region. Furthermore, the Decentralization Policy also provided that local governments in the highlands should address this situation by designing their own strategies and bye-laws for NRM.

The IP

The NRM Bufundi IP was established in 2009 primarily to address the challenge of poor soil fertility that was affecting the productivity of potatoes and beans, key crops in the area. Subsequently in 2010, SSA CP facilitated a process of renegotiating the NRM bye-laws within the IP. The process involved consultations on policy and institutional issues among IP members, as well as with their respective parishes and villages. It was observed that IP members were aware of existing rules regarding construction of soil conservation structures in individual farms, but there was no mechanism for their enforcement. Therefore, land degradation and loss of soil fertility continued to constrain crop production. The amendments on the drafted by-laws resulted in the enactment of NRM by-laws, titled 'Bufundi Sub-county NRM Bye-laws, 2010' (Adekunle et al., 2013). This provided legitimate ground for community sensitization measures and enforcement of the rules by local leaders thereafter. For instance, in Kacerere parish, the Kacerere Anglican Church of Uganda established the Kacerere Gravity Flow Scheme Committee to oversee the distribution and installation of water taps in the parish. The

committee consulted the Bufundi sub-county NRM bye-laws to support the implementation and enforcement and, as a result, well maintained soil and water conservation structures were observed in several household gardens.

IAR4D principles illustrated

Integration of Perspectives, Knowledge and Actions of Different Stakeholders

Stakeholders in the IP ranged from farmer groups as primary beneficiaries, government extension workers as enforcers of bye-laws, representatives from local government who mobilised farmers and were directly responsible for enforcement of bye-laws, village NRM committees responsible for following up on bye-law implementation, NGOs and church committees who provided farmers with planting materials and training in soil and water conservation practices, and researchers who coordinated the IP. All of them were involved in identifying different policy and institutional issues in NRM and formulation of bye-laws, together with the government authorities at the district and sub-county levels. Three major issues were identified: (1) the need to update and document existing NRM bye-laws, (2) the need for sensitizing the communities and local leaders prior to implementation, and (3) the need for the efficient enforcement of the bye-laws.

They fixed a schedule of monthly meetings that provided opportunities for farmers to share their experiences with the participating organizations. The IP manager maintained records of these meetings and shared them at different fora. The monthly meetings also provided an opportunity for dialogue between organizations. The SSA CP partners undertaking research (IAR4D) met every three months to share research progress on the IP. At the LKPLS level, meetings were held annually. At these meetings, partners would agree on a joint work plan to be executed during the coming period. Other meetings between the participating organizations were convened as required. Results of these processes were shared with KDLG to garner more support from partners to sustain the innovations.

IAR4D integrates the Learning that Stakeholders Achieve through Working Together

In addition to soil and water conservation practices, farmers received training on various issues from the multiple organizations involved, such as making and using of energy-saving stoves, processing banana into wine, and other income-generation activities. Women learnt to set up home gardens to grow vegetables making use of the soil and water conservation structures. The Kacerere Church took a leading role in NRM practices

through its water committee and worked closely together with Nature (U) who provided tree seedlings to member households; while a local NGO KULIKA supported soil and water conservation practices in the community. The IP partners interacted with the church authorities, members of the water committee, and staff of Nature (U) and individual households to learn from their experiences and understand the nature of their operations during action research activities.

IAR4D integrates Analysis, Action and Change across the Different Dimensions of Development

Integration of analysis, action and change across different dimensions of development is still in progress. While the action plan developed by the IP focused on NRM activities, it also included allied activities that emerged from the results of action research undertaken by the partners in the extension phase of the project. The latter was based on the expertise of the participating organisations—for example, BSU participated to facilitate activities of NRM bye-law formulation, ICRAF on agro-forestry, KAZARDI on potato seed development, KDLG to provide extension services. KULIKA, a private partner, concentrated on promoting vegetable/kitchen gardens for women farmers. The action research indicated that more attention was needed for targeting youth and women-headed households for inclusion and participation in IP activities. This was also seen as important, as most NRM activities were labour-intensive and required physical effort which older farmers were incapable of undertaking. This also led to bringing organizations working on issues related to women and youth into the IP. The action research also pointed out that NRM activities be linked to enterprises having profitable markets and, by consequence, include stakeholders who could drive value chains towards more efficient NRM. The findings of the action research were integrated into the IAR4D process that also sought to empower local institutions for bye-law enforcement and monitoring.

With respect to the different dimensions of development, besides reduced land degradation and better soil and water conservation at household level, visible improvement in incomes and livelihoods over a wide range of social categories was also observed. The impact beyond economic returns was partly assessed in a study at the end of the SSA CP in 2014. The study, undertaken in Kacerere parish in 2014, found that while 14% had fully adopted, 73% of the respondents had partially adopted the formulated NRM bye-laws. Of those who adopted the bye-laws, 85% dug trenches, while 60% used grass strips. Furthermore, the perception that the formulation of bye-laws was a relevant step in NRM was found to be highly significant in contributing to investment in conservation structures by a given household (Kalibwani et al., 2014).

IAR4D Integrates Analysis, Action and Change at Different Levels of Spatial and Social Organization

Inclusion of more stakeholders in the IPs created more linkages with private sector namely processors, traders and end-users of the products. This helped to tackle the challenges related to development of the potato value chain. Traders from Kampala who were identified to work with the IP were not satisfied with the quality of potatoes; this was further compounded by the distance between Bufundi and Kampala. When the SSA CP came to an end in 2014, these and other challenges were left to be worked out within the established IP framework together with the sub-county and district authorities.

Changes at Different Levels

Kacerere parish and the water committee were responsible for monitoring the structures. Farmers received training on various issues from the multiple organizations involved in addition to NRM. They received training in the manufacture and use of energy-saving stoves, processing banana into wine, and income generation in general. Women in particular learnt to grow vegetables near their homes using the soil and water conservation practices and structures. They sold the vegetables for income and also used them to improve household nutrition. They were able to save water and do rain harvesting. They appreciated not having to collect water from distant places on a hilly terrain. Individual researchers and partners on the IPs were learning to relate better with farmers on NRM issues, as well as with other partners on the IP in pursuit of NRM.

Changes at organizational level can be expected when the results of action research are integrated in future operations at the IPs. Partner organizations are expected to preferably link NRM activities to enterprises that have a profitable market that can reward NRM efforts. This will require that organizations not only concentrate on extension service delivery, as is normally the case, but go a step ahead to address marketing issues or link with other partners that will address them. At institutional level, the process of bye-law formulation that was completed in 2010 provided a good starting point for changes at that level. However, their implementation, enforcement and monitoring remained a challenge.

Lessons Learned

The results of the action research have identified village local institutions that can be empowered and supported by the district local government to take on the role of enforcing by-law implementation at village level. This is expected to result in better institutional management of NRM issues. However, at the end of the SSA CP research phase in 2010, community sensitization stalled and many community leaders continued not to embrace their role of enforcement. A form of incentives might be needed to support stakeholder commitment and ownership.

CASE 2

Infrastructural Innovations / Multipurpose IP *Uganda*

by Twabaze J, R Kalibwana , MM Tenywa, SO Nyamwaro and RA Buruchara

Context

Bubaare Innovation Platform (IP) is one of the IPs that was formed by FARA SSA CP in Kabale District of south-western Uganda. It is located in the Kigezi highlands that support some of the highest population densities in the country at 400 persons/Km2. Sorghum is a traditional crop and is a widely grown in this area. It is usually processed into a local non-alcoholic beverage called Bushera, which is important to the people in both terms of nutrition and income. Although a socially and culturally important crop, the low yields, tedious work and time associated with the processing of sorghum has made it unprofitable for the farmers to invest meaningfully to put sorghum on the market.

The IP

The Bubare IP was established in 2009 in order to create a sorghum value chain that was market demand-driven, responsive to innovative product processing and promote diversified utilization techniques. All the eight parishes in the sub-county participated in the sorghum IP. Diverse value chain actors were brought together on the IP and engaged in some interlinked activities with a mutual goal to address the problem of low sorghum productivity and profitability. The process was initially researcher-led, but over time more stakeholders joined, having seen the opportunities the engagement could bring for them along the sorghum value chain. A committee of nine members was constituted to govern its affairs. In about 4 years after its establishment, the IP was able to promote high-yielding varieties, produce several marketable sorghum products, and also introduce other enterprises/commodities other than sorghum, as well as bring in a number of services and new stakeholders. The IP successfully registered a multipurpose, multi-commodity IP cooperative society and acquired some assets. In 2014, the IP had a membership of over 1,125 farmers.

IAR4D Principles Illustrated

Integration of Perspectives, Knowledge and Actions of Different Stakeholders around a Common Theme

Relevant stakeholders came into the IP through regular interactions, such as partner meetings and research activities. They shared a common understanding that low profitability was the result of poor productivity of sorghum and lack of value addition. IP member group meetings were held every month, where members shared developments, challenges and other issues concerning interactions with partners, production and stocking of sorghum. Some farmer members dropped out when they realised that they would not get free inputs. The IP partners meet every three months to jointly prepare work plans. They also reviewed planned and implemented activities while continuously assessing each stakeholder's role. Once a year, the partners met with other partners in the LKPLS Rwanda and DRC sites to share experiences. The IP comprised several self-help farmer groups as members. Registration of the IP as a cooperative society created access to credit by groups with corresponding benefits distributed to them on the basis of shareholding.

IAR4D Integrates the Learning that Stakeholders Achieve through Working Together

The farmer groups were also trained by the Makerere University Food Science and Technology group on high quality processing making use of food weighing machines, sealers and bags. They also analysed the nutrient content of the sorghum products. Integration of stakeholder learning has been an on-going process. The stakeholders learnt development of new varieties, and new marketable products from each other. For instance, the processor learnt about preferred packaging and sizes from the market, about quality of products from the university; processors informed farmers about the quality of sorghum required for processing in order for both to meet the obligations of the contract.

IAR4D Integrates Analysis, Action and Change across the Different Dimensions of Development

There were financial innovations at the IP. Before the establishment of IPs, farmers were only relying on the traditional means, such as selling small livestock, and nigina - a form of in-kind rotational contribution and cash rounds to support their financial needs. However, the volume of resources involved was small and often insufficient to enable smallholder farmers to break through the vicious circle of poverty. Following formation of

the IP, farmers were trained in financial literacy, savings and credit, teamwork, recordkeeping and organizational development for the famer groups to access funds from savings cooperatives (SACCOs) and community banking. The IP contributed to purchasing VSLA kits for recordkeeping. By virtue of being members of the Bubare IP cooperative society, farmer groups were able to obtain loans from Muchahi SACCO and distribute them among members. Individual farmers used the funds to support other household enterprises of their choice in addition to sorghum. The IP cooperative society enabled access to credit to a number of smallholder farmers of a range of social categories, who otherwise could not have got access to credit.

The IP got land from the sub-county local government to construct space to carry out their activities. The IP was poised to acquire processing and packaging equipment for potato crisps and honey to be stored at the facility. The IP members also signed a MoU with the sub-county authorities for a storage facility to bulk and store the sorghum produced by members. With the initial funds obtained from Muchahi SACCO, the supply of sorghum to the processor (Huntex Ltd.) thus improved by the collection the sorghum, bulking at the storage and, thereafter, delivering for processing.

The farmer groups signed contracts to acquire loans from Muchahi SACCO and to transact with the processor, Huntex Ltd. A memorandum of understanding (MoU) was signed between the sub-county authorities and IP farmers for the usage of storage to bulk their sorghum. The availability of resources enabled the farmers to store the produce after harvesting, to sell when market prices would increase. Therefore, they were able to realize almost 100% price rise for sorghum from Uganda shillings 800 (US$ 0.32) to 1,500 (US$ 0.6). This phenomenal increment in price boosted their morale. So far, 45 farmer groups had been trained and were thereafter federated into a community bank. Over 12 groups accessed loans, acquired computers, and promoted value addition technologies.

The IP leadership approached a local confectionery industry to see if sorghum flour can make good products and if there was scope to create new market outlets. The IP created a link to a childcare home in Nyamiyaga Bubare for supply of highly nutritious sorghum flour for feeding the children at breakfast. With the experience of the sorghum value chain activities that led to increase in income, the farmers decided to take on promotion of potato and honey value chains.

IAR4D Integrates Analysis, Action and Change at Different Levels of Spatial and Social Organization

The political will and technical support provided by local government at district and sub-county level supported the growth of the IP, generated confidence and created a good

working environment. Researchers published scientific papers about these achievements and shared them at international level. The Makerere University introduced a market information system to farmers on their mobile phones, and also linked them to a group that assisted them to develop a farmers' website (website y'abahingi ba L3F omuri Uganda). The site provided information to the public about the activities of Bubare IP.

Changes at Different Levels

Farmer leaders of the IP were invited from time to time to share their experience and knowledge of IAR4D under the NAADS programme that was also implementing multi-stakeholder IPs in other sub-counties. The local government authorities integrated IP activities into their five-year development plan. The IP became a model for demonstrating the use of IAR4D principles and has hosted several visitors for learning purposes. The Ministry of Trade showed interest in the platform activities and supported activities of certification. Staff in the Production Department at the district level were able to establish multi-stakeholder innovation platforms in other areas outside the project area and as a component under the NAADS programme.

Lessons Learned

So far, there has been no default in loan repayment, and the contracts with the processors have been successful. However, during the action research by partners, it was found that rural farmers, both IP and non-IP members, still needed to learn more about formulating contracts. The positive development was that individual researchers were changing the way they were conducting research; they are now able and willing to do research in a multidisciplinary context.

CASE 3

Maendeleo Bean IP, *Democratic Republic of Congo (DRC)*

by Nyamwaro, SO., Buruchara, RA., Tenywa, MM., Mogabo, J., Kalibwani, R., Twabaze, J., Ramazani, M., Muke, A., Karume., K., Mandefu, P., Bikuba, GB., Mufungizi, C.

Context

Maendeleo IP is located in Rubare, Kisigari (sub-county), Rutshuru District, North Kivu Province of Eastern DRC. The IP consisted of various participating villages in the form of six Antennae. IPs in the North Kivu Province were established in a volatile situation in which political insecurity was the order of the day. The technological climate was unstable, with very little technological advancement, hence only a few appropriate technologies were available. The government was organized in national, provincial and local authorities, so that very few implementable policies that supported constructive development initiatives existed.

The IP

The IP was initiated in 2009. On the basis of market access, food security and the socioeconomic value attached to Maendeleo bean, all relevant IP stakeholders decided to focus on the bean as a crop to provide income for farmers. Stakeholders organized themselves and elected a committee to run the affairs of the IP, called the Maendeleo Bean Innovation Platform. With time, the IP attracted more members, including farmers, policymakers, researchers, extension agents, training institutions, service providers and others. Over time, it increased its engagements and diversified into new products, such as soybeans, chilies, tomatoes, other vegetables, fish farming, beekeeping, livestock and agroforestry. The IP received its financial resources for use and upkeep from members' fees and subscriptions from well-wishers. While the membership has been dynamic partly because of sporadic insecurity problems in the region, its current membership has gone beyond 1,282, the majority (849) of which are women.

IAR4D Principles Illustrated

IAR4D Integrates Perspectives, Knowledge and Actions of Different Stakeholders around a Common Theme

The IP membership has been dynamic with partners joining and exiting based on their interest in the theme, i.e. development of the Maendeleo bean value chain. During deliberations held several times a year, stakeholders set up various mechanisms to promote the bean. Four commissions- market, M&E, credit and production- were set up to enhance leaning and improve collective marketing of beans by linking producer groups to traders in Kinshasa, Goma and Bukavu cities. Seven bean varieties with high market demand were identified and tested, out of which four were accepted. Also, bio-fortified and micro-nutrient rich bean varieties were tested on farmers' fields.

IAR4D Integrates the Learning that Stakeholders Achieve through Working Together

Various meetings organised at different levels included demonstrations and field days, where solutions to farmers' issues were explored and acted upon. Participatory action research was undertaken towards solving identified issues like (1) agronomic practices on row planting, spacing, and intercropping; (2) introduction, testing and adaptation of bio-fortified/micro-nutrient rich (iron) bean varieties supplied by Harvest Plus; (3) integrated system improvement based on legume-intercropping system. IP members helped to organise farmers into market associations and train others on new market strategies for beans. The research helped take care of environmental issues, such as soil fertility improvements through fertilization, and adaptation and adoption of recommended agricultural practices, including soil and water conservation and mulching practices. Stakeholders of different socioeconomic levels participated in these processes.

In 2014, DIOBASS and INERA, along with PRONAPLUCAN conducted a one-day training course on different transformations of soybeans. The training provided the members an understanding of all the available possibilities to add value to soybean. Farmers were also given pepper seeds for planting and distribution. The farmers observed that line planting needed more material and was time-consuming. They found that line planting did not increase crop yields, but proper spacing saved time and quantity of seeds and other materials used in line planting, as well as increased yields substantially- this was validated by researchers from INERA.

IAR4D Integrates Analysis, Action and Change across the Different Dimensions of Development

In all IP activities, special attention was given to providing women and youth equitable access and control of resources, as well as benefits of improved livelihoods. This included assets, agricultural inputs and technologies and knowledge, extension and financial services, and decision making for both men and women. All actors were sensitized to be aware of gender differences through capacity building trainings. This led to men willingly and ably supporting their spouses, especially with improved crop and knowledge management skills. They assisted their women in planting, weeding and harvesting, unlike in the past. These efforts also led to equitable decision making at all levels, starting from the household. Moreover, as a result of increased incomes from reliable and sustainable market options, stakeholders, especially farmers, were able to improve their standard of living and change their lifestyles.

IAR4D Integrates Analysis, Action and Change at Different Levels of Spatial and Social Organization

Various organizations were part of the IP and participated in all its activities; hence, it has enhanced both horizontal and vertical integration of issues of interest. For example, integration of action and change at different levels occurred spatially in farmers' fields, landscapes and even research stations. This was well demonstrated in the undertaking of value addition practices, e.g. drying, grading and packaging throughout the beans value chain.

Changes at Different Levels

It was observed that participating individuals underwent changes in attitude and behaviour, as they gained new skills. Topics of learning concerned teamwork, communication and conflict management. Many organizations represented in the Maendeleo IP either fully or partially accepted the IP approach of undertaking IAR4D. Some affiliated organizations experienced changes in outlook, in core mandates, and in networking (e.g., in approaches to facilitation and technology generation). As a result, some NGOs, NARS, private sector, and local government started incorporating the IAR4D approach in their programmes and plans, and were supporting the formation and operations of IPs.

Lessons Learned

One of the biggest obstacles to the development of the Maendeleo IP was limited and uncoordinated policies at the national level to support the platform. Further sporadic conflicts and insecurity leading to wars brought about the displacement of stakeholders. The instability also affected formulation and implementation of supportive natural resource bye-laws at the local level. In some instances, prevalent cultural norms and practices came in the way of addressing gender participation and relations among IP stakeholders.

CASE 4

Conservation Agriculture and Food Security IP in *Malawi*

by Nelson Mango

Context

Maize is the main staple in Malawi and is consumed by almost all households. Balaka District, which has an average rainfall of less than 600mm per year, is considered one of the driest districts in the country. The area is characterized by low and unreliable rainfall, sandy soils and declining soil fertility, resulting in reduced yields. Most agriculture is rainfed; maize is the main crop, but some farmers also grow cotton and tobacco as cash crops. Rise in population has resulted in a decrease in farm sizes, with an average land holding of less than 0.4 ha per farming household. Until recently, farmers had limited access to improved seeds and fertilizers, and inadequate labour resulted in poor management of fields. The average yields of maize under smallholder management have been very low, averaging 1.3 tons per hectare. In efforts to redress this situation, the government, through its Farm Input Subsidy Programme, assisted targeted households with subsidized inputs to boost food security.

The IP

In July 2009, an IP was established in Balaka District that initially targeted five villages: Ntonya, Chimkwezule, Chifodya, Zam'mimba and Njereka. Together, the stakeholders identified three key opportunities to work on:

1. Improving household food security and incomes through increased production of maize; by making use of conservation agriculture technologies; subsequently, they included tomatoes as well;
2. Promoting knowledge on sustainable and profitable agricultural production systems, including timely availability and purchase of crop inputs, and resource sharing; and
3. Encouraging collective approaches to marketing by farmers.

The IP operated at two levels – at the community level membership comprised local stakeholders, farmers, village headsmen and local extension workers, either government or non-government organizations; at the district level, the IP included a wider group of stakeholders, such as extension staff, input suppliers, marketing institutions and local farmer representatives. As activities gained momentum, new actors joined the platform.

IAR4D Principles Illustrated

IAR4D Integrates the Perspectives, Knowledge and Actions of Different Stakeholders around a Common Theme

The IP characterization exercise that took place prior to IP formation indicated that natural resource management, especially the need for efficient use of soil moisture and nutrients, was a priority. Therefore, conservation agriculture was selected as an entry point activity for the Balaka IP. Stakeholders at the district level met every month to discuss and learn from each other about ways to address issues related to agricultural productivity enhancement. Processes such as Participatory Learning and Action Research (PLAR) were introduced to facilitate feedback, learning and reflection among different stakeholders. These processes helped in building linkages between various levels of the IP and ensured that stakeholders' visions, aspirations and interests were incorporated in planning processes at all levels. The facilitator's role was to maintain the linkages and enhance feedback loops with local communities. Traditional institutions of village chiefs were used for quick and effective dissemination of information at the village level.

IAR4D Integrates the Learning that Stakeholders Achieve through Working Together

Capacity building was considered a critical activity to strengthen interactions among IP members and incorporate research in innovation processes. Capacity development was designed to create and foster institutions supporting new patterns of interaction, behaviour, routines, and norms and with an incremental process of reflection and learning.

One of the main field activity was the establishment of learning sites, where researchers and farmers managed trials and demonstration plots to test CA and soil fertility-enhancing technologies in both maize and tomato. This allowed evaluations of the effects of the various components of CA systems on crop productivity and stimulated adoption of CA, and further experimentation by farmers. While researchers took the lead

in establishing protocols for these trials, information sharing was strengthened through farmer field days, farmer exchange visits and joint monitoring visits by stakeholder. Public extension and NGO workers facilitated early, mid and end of season evaluations with farmers from other areas.

Marketing of produce was indicated as one of the greatest challenges before the initiation of Balaka. The IP addressed this by training farmers and linking them to lucrative markets where they were able to sell their produce with a reasonable margin. Input suppliers were invited to the IP meetings, resulting in more input supply outlets being made available, and repackaging of inputs in smaller quantities to make them affordable and convenient to transport. Output markets offered services to farmers by purchasing their maize and pigeon pea, while some stakeholders took over the responsibility of postharvest handling and sourcing of big output markets on behalf of the farmers.

IAR4D Integrates Analysis, Action and Change across the Different Dimensions of Development

At the local level, the farmers practising CA benefitted from improved food security and additional income. Participation of women within the IP was accelerated by inviting a public extension officer who specifically championed and incorporated women and youth in collaboration with the district authorities. This led to an increase of women participation in the IP from 25 women in 2008 to 750 women-headed households in 2014.

IAR4D Integrates Analysis, Action and Change at Different Levels of Spatial and Social Organization

The PLAR methodology was used for out-scaling CA technology from farmer groups to association level, and from pilot district to nationwide implementation. This approach helped to ensure that the innovations were firmly rooted in the institutional arena, and through an iterative process of testing, implementing and evaluating, the IP was able to influence policy changes. The IAR4D approach was incorporated in the Malawian government extension policy as the Agriculture Sector-wide Approach programme (ASWAP).

Changes at Different Levels

At the community level, there was evidence of improvement in organizational capacity. Existing community institutions were transformed into Rural Group Enterprises and merged to form community level innovation platforms. The success of Balaka IP has led to the institutionalisation of multi-stakeholder innovation platforms approach into the existing agricultural extension policy, which would not have otherwise been possible. Since the IP's main focus was on including different stakeholders, their contribution to policy analysis and change was vital. Moreover, in Balaka both government representatives (Machinga ADD, Balaka DAO, Balaka District Council), the Department of Agriculture Research Services (Chitedze Research Station), Meteorological Department, Government parastatals (the Agricultural Development and Marketing Corporation) were included in the IP and the process to bring about sustainable change.

Lessons Learned

The IP has changed the way to conduct research activities. All research activities now emanate from the innovation platform itself. Problems are diagnosed and research is conducted to generate solutions, with emphasis on Participatory Learning and Action Research. Under the framework, researchers learned to work together with other stakeholders, including the private sector. The multi-sectoral approach that was implemented by the IP really assisted the participating organizations to do things together, plan and share experiences together. CIAT and DARS conducted research together on matters of CA and marketing. Capacity building through the IP resulted in national research scientists getting sponsorship to pursue postgraduate programmes in different universities abroad.

CASE 5

Thyolo Vegetable IP in *Malawi*

by Charles Malidadi and Thomson Chilanga

Context

The Thyolo IP was formed in 2008 in southern Malawi, within the Zimbabwe–Malawi–Mozambique (ZMM) pilot learning site as part of the SSA CP. Owing to favourable climatic conditions and presence of perennial rivers, the district is traditionally a vegetable-producing area. It is close (40km) to the commercial city of Blantyre that provides a ready market for vegetables. The average land holding is less than 0.5 ha per household – this is primarily due to tea estates that occupy larger portions of land. Thus, vegetable production was envisaged as an alternative way of increasing smallholder farmers' income and also improving their nutritional status.

The IP

The IP was managed by a committee elected by its members. Stakeholders included farmers, extension agents, researchers, input suppliers, policymakers, traders, transporters and microfinance institutions. The main focus of the IP was to resolve constraints to development, dissemination and uptake of science-based practices in the vegetable value chain with reference to production, harvesting, preservation, storage, transport, processing and marketing. The participating stakeholders undertook a joint crop prioritisation process and identified the following crops: amaranthus, tomatoes, giant rape, okra, Ethiopian mustard, and cabbage. In addition, the IP sought to test the following specific hypotheses:

a If income and consumption patterns of farmers can be improved through increased vegetable production, by creating synergies among the capacities, knowledge systems, technologies and processes of different stakeholders.

b If, within an IAR4D context, focus on indigenous vegetables over exotic vegetables could benefit consumers and producers.

IAR4D Principles Illustrated

IAR4D Integrates the Perspectives, Knowledge and Actions of Different Stakeholders around a Common Theme

IP member participation varied within the season; towards the end of the cropping season, membership increased—because some members like buyers and transporters came in only during the time of harvest. Every member was given equal opportunity to participate in planning and in activities, and none of the stakeholders dropped out—perhaps because the benefits accrued were adequate for them to continue interacting with each other. At the district level, the District Executive Committee (DEC), headed by the District Commissioner, and heads of NGOs participated in joint planning for IP activities. This ensured that all other line ministries present in the district were aware of the IP activities. National planning meetings were held twice a year and were used as a forum to evaluate the progress of the IP. This enabled platform members to direct their energies towards specific tasks and make rational decisions about changes in platform goals and processes. In addition to the national meetings, the IP had three major scheduled meetings. The first meeting was largely for stakeholders in the IP to outline their planned activities; the second was held in the middle of the season to monitor progress, while the third was used for reviewing the impacts of activities. The latter was also used to realistically assess the IPs objectives and, if needed, to reformulate plans for the next season.

IAR4D Integrates the Learning that Stakeholders Achieve through Working Together

All stakeholders received training on IAR4D principles, group dynamics, vegetable production and marketing. Learning was encouraged among stakeholders. For example, field days and joint learning visits were conducted to help farmers learn from each other on the best practices of vegetable production, utilization, value addition and marketing at the local level. Farmers shared knowledge on traditional low cost irrigation methods and helped other farmers to put it into practice to improve their irrigation systems. A district workshop was organized through DEC in order to share knowledge and experiences among the stakeholders. Joint problem diagnosis, planning and reflection sessions were conducted and attended by all the stakeholders. Another national workshop was organized, attracting stakeholders from all over the country, to share the experiences of Thyolo IP and to plan the way forward for the IAR4D agenda.

IAR4D Integrates Analysis, Action and Change across the Different Dimensions of Development

Farmers used a staggering method for vegetable production that helped address the challenges of pests and diseases, especially during the rainy season. Production increase created a series of second generation problems. First, it created an increased demand for inputs. Most farmers preferred to buy all inputs at once; hence, one agro-dealer designed a vegetable pack (a pack containing all farm inputs in a single box); second, increased production led to a marketing problem, because there was a limited number of buyers within the IP. There was need to target additional traders to absorb the additional produce. Through joint efforts by all stakeholders in the IP, farmers were introduced to new outlets.

The community in Thyolo follows a matrilineal system, which translates into women having rights to land ownership, as opposed to men. Women lead the production and marketing of vegetables. In the IP, over 60% of the participants were women and deliberate efforts were made to encourage men to participate in the production of vegetables and to eventually join the IP. This resulted in the need for expansion in the area for vegetable cultivation, which was addressed by renting lands from farmers in nearby villages. As vegetable production did not require large capital investments, vulnerable groups, such as female-headed households and child-headed households were also encouraged to join the IP.

IAR4D Integrates Analysis, Action and Change at Different Levels of Spatial and Social Organization

Increased market prices for vegetables, especially during rainy season, as well as government support for infrastructural development such, as road networks and small scale irrigation enhanced farmers' willingness to further invest in vegetable production. The Agricultural Wide Sector Approach (ASWAP) adopted in Malawi for implementation of all agricultural activities followed the example of this IP in planning and implementation of agricultural activities at national level.

Changes at Different Levels

Indigenous knowledge, like bamboo irrigation system, was identified and documented, thereby leading to recognition of farmers' practices by researchers. The research centres changed their management style towards a more demand-driven market-oriented service delivery. They became more receptive about interacting with farmers and engaging in farmer-participatory research. There was also an emphasis on building research teams with greater integration of social and technical experts. The Ministry of Agriculture showed commitment to strengthen and formalise alliances with key stakeholders in particular research and development themes, to allow for more interactive learning through innovation platforms.

Lessons Learned

Research indicated that indigenous knowhow of farmers should not be underestimated, and as such there was little reinvestment required for natural resource management, especially soil and water conservation. Researchers realised that farmers' experience can make worthwhile contribution to developing new techniques in sustainable farming.

CASE 6

Maize-Legume IP of the Nigerian Guinea Savannah

by Ishaku Amapu

Context

The Maize-Legume Innovation Platform is one of the four commodity-based IPs established by the Nigerian Guinea Savannah Task Force (NGS TF) of Kano-Katsina-Maradi Pilot Learning Site (KKM PLS). It is located in Ikara Local Government Area of Kaduna State. Although the Guinea savannahs are assumed to have the greatest potential for agricultural production, the agro-ecology is characterized by inherently poor soils and poor access to innovations, compounded by high prices of inputs and a lack of credit as a result of volatile agricultural market prices. Furthermore, ad hoc and inconsistent policy pronouncements and proclamations have left the private sector leery of government intentions, and this has resulted in reduced production and/or import of agro-inputs. Also, rapidly increasing population has resulted in reduction of the average size of farms.

The IP

A wide spectrum of stakeholders was brought together to address the problem of soil fertility decline in the Nigerian Guinea Savannah (NGS). They concluded that there was a need to set up a 'research for development agenda' that would address the technological, institutional, socioeconomic and political constraints to improving land productivity, rural household incomes and the natural resource base of the region. Actors engaged were local government councils (LGC), farmers' organizations, community-based organizations (CBOs), extension organizations in Kaduna and Katsina states, private sector stakeholders, and national and international research and development organizations. The range of actors involved was dynamic, admitting new partner institutions as new problems emerged and assigning/ switching roles as needed, over time. The IP was locally coordinated by a researcher from the Institute for Agricultural Research at the Ahmadu Bello University. The IP management committee consisted of representatives of farmers, research organizations, extension organizations, the private sector and LGC.

IAR4D Principles illustrated

IAR4D Integrates the Perspectives, Knowledge and Actions of Different Stakeholders around a Common Theme

Integration of perspectives, knowledge and actions of different stakeholders around a common theme was achieved through several meetings and training workshops, which included pre-proposal workshops to diagnose problems, pre-implementation workshops, meetings and annual planning cum review meetings. The meetings and training events served as opportunities for stakeholders to stimulate cooperation on a level playing ground. Researchers from IAR, with the support of extension agents from KADP, facilitated four action-research experiments in farmer fields across five pilot villages. The four modules were: identification of fertilizer types by the IP actors, participatory design of experiments to enable farmers to question their soil, participatory evaluation of maize, soybean and cowpea performance in the field, and evaluation of results by farmers and different other IP actors.

IAR4D Integrates the Learning that Stakeholders Achieve through Working Together

Exchange visits were systematically organized during the cropping seasons to jointly visit experimentation plots. Non-participant farmers in the villages and targeted farmers from the other villages in the LGC were also invited. Experiences from the fields revealed that such visits where farmers themselves explained what they were doing and showed the inputs they used and shared learnings were most useful. Towards the end of the cropping season, a field day was organized for every single IP. Various factors, such as farmers coming from different villages, farmer associations and unions, local chiefs, agricultural commissioners, representatives from the ministry of agriculture, directors of research and extension institutes and rural development professionals, participated in these events. The field days served as a rural workshop where farmers presented their results. The aim was not only to share knowledge and information, but also to sensitize decision-makers from the private sector on the constraints that hindered the use of new knowledge and technologies by farmers.

IAR4D Integrates Analysis, Action and Change across the Different Dimensions of Development

The IP perspective triggered the development of an apex farmers' organization to support innovation processes. It stimulated greater networking between farmers and other actors to improve their maize-legumes production systems. Farmers, seed

companies (e.g. Premier Seeds) and fertilizer companies (e.g. Golden Fertilizer Company) were linked to facilitate direct negotiation with private companies supplying agricultural inputs. This linkage facilitated direct access to inputs, realised through bulk purchasing by farmers in the apex organization. Although at first they were not sure of their roles and responsibilities, policymakers and private sector actors acted as potential investors to help achieve the purpose of the IP. The fostering of strong linkages between farmers and the private sector emerged as a new role for the facilitators.

IAR4D Integrates Analysis, Action and Change at Different Levels of Spatial and Social Organization

Scaling out of maize-soybean and maize-cowpea production options was a major achievement of the IP. It led to expansion of activities from 5 pilot villages to all of the 30 villages under a negotiated arrangement with the apex farmer's organization and extension organization (KADP) with support of the local government. The IP is now hosted by the apex farmers' organization and the local government has expressed interest to support it financially.

Changes at Different Levels

Improvement in the maize-legume production system in order to address problems of soil fertility decline and Striga infestation has led to an average yield increase of up to 50%, with corresponding increase in income. The IP triggered development of an apex farmers' organization to support the innovation processes. Lead farmers in the pilot villages were trained to disseminate new practices; each to a ring of five villages surrounding their own. These lead farmers have been actively engaging with the extension organization (KADP) and the agricultural extension service of the local government. The agricultural research coordinating body in Nigeria, Agricultural Research Council of Nigeria (ARCN) and the Federal Ministry of Agriculture and Rural Development (FMARD) have expressed interest in using IAR4D principles in its operations. This should have considerable impact on the agricultural policy of Nigeria.

Lessons Learned

Lessons learned from the pilot experience are being documented to inform other institutions and organizations to help replicate the IP perspective to effectively address other agricultural development problems. The success of this IP originated partly from the small-scale farmers working together to create access to input, credit and markets. However, it is clear that farmers need incentives to keep working together as a collective body. One challenge is to assess the relative impact of and on different categories of stakeholders. A system was, however, put in place to monitor the benefits to all IP members to ascertain if the IP can be sustained; the results are awaited.

CASE 7

Vegetable IP, Tomato Irrigation in *Northern Nigeria*

by M.B. Hassan, R. Yahaya, A. Abdulrahman, I.Y. Amapu

Context

Among the wide range of vegetables grown in Nigeria, tomatoes clearly stand out as an important crop both in scale of production and level of consumption. Tomatoes are grown by all dry season market irrigators who regard it as their principal crop. Kano-Katsina-Maradi forms one of the Pilot Learning Sites (PLSs) under the SSA CP. A participatory diagnosis exercise conducted in 2008 in Kudan Local Government Area revealed the following major challenges for tomato production: No water and soil fertility management measures for off-season irrigation farming, unreliable seed sources and high occurrence of pests, lack of effective extension services and poor marketing facilities. Against this background, the main challenge identified was the need to increase vegetable production, especially tomatoes, and improve farm income. This would be done by building capacities within the innovation system by: helping policymakers understand the strengths and weaknesses of the vegetable subsector; and providing inputs, and establishing linkages between farmers, agrochemical companies and seed companies.

The IP

The vegetable IP was established in Kudan Local Government area of Kaduna state and five villages were targeted as pilot sites. Stakeholders were brought together to address the challenges faced in tomato production. The main purpose of forming the IP was to improve farm incomes by increasing tomato productivity through the use of improved technologies for efficient use of irrigation water and good quality tomato seed. The IP would help as a platform to promote sharing of knowledge among stakeholders, and create opportunities for bulk purchase of quality inputs and marketing of farm produce.

IAR4D Principles Illustrated

IAR4D Integrates the Perspectives, Knowledge and Actions of Different Stakeholders around a Common Theme

The stakeholders involved were research and development organisations, training institutes, entrepreneurs, input suppliers and financial institutions. These actors analysed the policy environment and the subsector, and showed interest in building capacities of the innovation system. Researchers from IAR and IFDC initially played the role of facilitating the IP towards defining common goals and mutually agreeable entry point activities.

IAR4D Integrates the Learning that Stakeholders Achieve through Working Together

Joint analysis resulted in a shared understanding of the weaknesses and gaps of the system. For example, there was limited exchange of information between the tomato growers and the local extension system. The IP also planned action-research on: varieties, water management and fertilization schemes to improve the quality of the tomatoes and reduce their water content; and there was networking with agro-dealers and service providers. Learning at IP level was operationalized in the communities through on-farm trials and demonstration plots, training in agronomic practices and bookkeeping, exchange visits and field days. A major learning event was a training organized by IAR and NAERLS (National Agricultural Extension and Research Liaison Services, Zaria) which made producers critically aware of their competitors and seasonality of production. This stimulated them to improve productivity and quality and to change the production cycle in response to market demands. An evaluation was conducted by stakeholders at community and local government levels; together, they conducted an analysis of progress and gaps of the past production season.

IAR4D Integrates Analysis, Action and Change across the Different Dimensions of Development

Research and development has sought to enhance the efficiency of tomato production technology in terms of output and quality. Currently, the IP is appraising opportunities to expand the market by building linkages with restaurants in nearby cities. The IP is also collaborating with the Department of Agricultural Engineering of IAR to evaluate small-scale and locally developed processing equipment for sun-dried tomatoes; they are also negotiating with dealers of drip irrigation kits and other machinery like water pumps to match the subsidies available from KADP, and are also working on an arrangement with

the private sector to supply farmers with irrigation kits and training on maintenance. The IP is also working towards creating new partnerships to help tomato producers gain access to credit. Recently collaboration with other drip equipment companies from Burkina-Faso and France has been contracted and some samples have been on display in the field. The technologies however, have only partly been adopted due to inadequate supply from the suppliers.

IAR4D Integrates Analysis, Action and Change at Different Levels of Spatial and Social Organization

The project drastically improved interaction between research and entrepreneurs. The agricultural extension system was facilitated to work more effectively, and the numerous codes of practice of the different organizations were harmonized. Activities of the local government level informed the development of the operational framework of KADP through the participation of the extension director. The local government area where the IP is operating has taken responsibility of scaling it from 5 pilot villages to 30 villages under a negotiated arrangement with farmer's organizations, extension organization (KADP) and the support of the local government through its agriculture department.

Changes at Different Levels

A major achievement of the IP was getting all stakeholders to adjust activities and investments to ensure timely input provision, and supply of quality tomatoes to the market. Farmers were assisted with business and financial planning, and were taught how to assess returns on investment in their production cycles. Participatory workshops provided farmers with useful technical information that enabled them to grow and market tomatoes in a more scientific and professional manner. Coordination and bulking among producer groups from different localities within the region were also initiated to enhance their bargaining power.

Lessons Learned

In the course of this project, different stakeholders work together and learning from each other formally. In order for research to respond better, communication between small-scale tomato farmers and researchers needs to be improved further. The IP has introduced new ways of working in research organizations that will help overcome the weaknesses identified. There is need to find ways of increasing engagement with the private sector.

CASE 8

Rice Innovation Platform in *Nigeria*

by Christogonus Daudu

Context

Rice is an important cereal crop in Nigeria, with the demand superseding the production output. There is a deficit of 2.79 million tonnes, which makes the country the world's largest importer of rice, consumed across all income groups. Dandume Local Government Area (LGA), located in southern Katsina State in northern Nigeria, was selected for undertaking IAR4D activities. Rice farmers in Dandume are characteristically small-scale and resource-poor. Income from rice production, processing and marketing is marginal, mainly due to low land and labour productivity, marketing constraints, and policy/institutional barriers. Participatory analysis revealed that this was due to poor quality seed, poor water management, inappropriate crop management practices, limited size of cultivated area relative to labour use, low intensification, high production costs, and widespread use of handheld tools, resulting in drudgery. Similarly, marketing constraints were attributed to poor quality of produce, market access limitations and poor market information. This has been compounded by an unfavourable national and global policy environment where national subsidies do not reach farmers and global subsidies undermine competitiveness of locally produced rice. Furthermore, low capacity of farmers and other stakeholders to innovate, and lack of organized rice farmer groups have resulted in farmers' inability to negotiate better conditions for prices of inputs and outputs.

The IP

The IP was initiated in 2007 by researchers from IFDC and Ahmadu Bello University Zaria; however, the IP was official launched in November 2008. It consisted of a range of stakeholders participating in a continuous and interactive manner to develop, validate and disseminate improved rice production and utilization technologies. The issues addressed within the IP included (1) intensified upland rice production and value addition to meet an increasing rice demand in the market; (2) improved upland productivity for rice; (3) development of innovative rice farming practices; and (4) integrated innovation to scale out towards improved rice farmers' incomes in Dandume. The management committee created involved representatives of all stakeholder

groups. This organizational set up provided room for the stakeholders to express themselves in contributing to the activities and also enhance the innovation processes.

IAR4D Principles Illustrated

IAR4D Integrates the Perspectives, Knowledge and Actions of Different Stakeholders around a Common Theme

Between 2008 and 2009, the rice IP designed and implemented technologies through a participatory learning and action research process that aimed at improving land productivity for rice cultivation. This experiential learning process created a spirit of mutual learning between farmers and other stakeholders. This involved participatory diagnosis of nutrient-related soil-constraints, evaluation of fertilizer options, participatory evaluation of integrated weed management practices, determination of adequate planting methods and evaluation of soil and water conservation options for sustainable land management and enhanced rice productivity. It also included participatory action research for innovating/improving segments of rice value chain market. The ultimate objective was to empower farmers to take leadership of the process in full partnership with researchers and other stakeholders based on selection, design and demonstration of new and/or indigenous technologies from a 'basket' of sound scientific principles, and sustainable resource management options.

IAR4D Integrates the Learning that Stakeholders Achieve through Working Together

Five types of action research experiments were established in the different farmer fields in the pilot villages to support the farmers' need for enhancing rice productivity: (1) soil fertility diagnosis trial; (2) weeds management demonstration; (3) varieties screening demonstration; (4) planting methods; and (5) contour ridging demonstration. Knowledge management and information sharing activities, such as participatory evaluation of trials with farmers, field visits and farmer field days were organised where farmers shared the results and analysis of their activities and responded to comments and questions from other farmers from within the Dandume LGA community. Inter-village/farmer exchange visits helped farmers learn about technologies developed in other villages in similar conditions.

IAR4D Integrates Analysis, Action and Change across the Different Dimensions of Development

A gendered participatory assessment of constraints and opportunities for enhancing the livelihoods of men and women in the project communities showed that women were more constrained by socio-cultural factors and poor access to productive inputs, which reduced their participation in rice production. Some options were proposed for mainstreaming gender into action research that could be employed for achieving equality in distribution of project benefits within the communities.

IAR4D Integrates Analysis, Action and Change at Different Levels of Spatial and Social Organization

Seed companies, such as Premier Seed Ltd and Maslaha Seed, as well all members of the IP found a business opportunity in supporting rice farmers with quality seeds at the start of the cropping season. The success of the rice production practices for an intensified upland rice production selected by farmers has stimulated the demand from Dandume LG chairman to expand the intervention in all the 11 villages of his LGA. The LG chairman further released fund to buy machines and inputs to support rice intensification. The immediate impacts of exposure visits to farmer fields included the strengthening of cohesion, as well as accelerated formalization of the group to tap into new opportunities. Leadership of the rice IP was vested in the Dandume LG authorities. This is a positive sign for the sustainability of the IP that has been able to contribute to the development of local economy and farmers' prosperity.

Changes at Different Levels

The PLAR modules helped in increasing farmers' understanding and boosted their confidence to take on productivity enhancement activities. The relative importance and roles of the different stakeholders varied at different stages, but farmers' needs were always set as priority. Participation was a continuous negotiation process because of undisclosed interests, diversity in the behaviour of individuals, and different appreciation of benefits from those actors (Dangbégnon et al., 2010). A major achievement was the setting up and facilitation of an ongoing process to bring different groups into constructive engagement, dialogue and decision-making. Furthermore, learning through action research has equipped farmers to adjust to the options given to them and to respond to changes.

Lessons Learned

Challenges included limitations in involving women groups in rice production and processing without affecting existing socio-cultural norms. Continued capacity building for farmer's group organization and management is vital. Also continuing effort is required to strengthen stakeholders, especially the extension workers from KTARDA to enable them to take the lead in catalysing large scale changes by the Rice IP.

CASE 8

Mudende Innovation Platform in *Rwanda*

by Josaphat Mugabo

Context

Mudende IP covered one of the twelve sectors that form the Rubavu District in the Western Province of Rwanda. When the IP was established in 2008, the sector had only one technical agricultural extension officer. The area is known for Irish potato and milk production. The yield of Irish potato was on average 9 tons/ha due to poor quality of seeds and low farmers' skills in crop management. The Mudende sector is known to have a high number of cattle farmers, but only 10% of these farmers were able to sell milk due to low milk production and poor market access. Traditional animal husbandry characterized by local breeds and extensive farming was predominant. Households were more interested in cattle holdings as a status symbol rather than for milk production.

The IP

The main theme addressed by the IP collectively was low milk production and poor marketing of milk. It also sought to address the issue of low Irish potato yields as a sub-theme. The IP started with seven stakeholders and six more joined later on invitation by the farmers. The executive committee consisted of a chairperson, a vice-chairperson, a secretary and two advisers – all of them farmers. They also formed farmer sub-groups to discuss issues and report back to the IP committee.

IAR4D Principles Illustrated

IAR4D Integrates the Perspectives, Knowledge and Actions of Different Stakeholders around a Common Theme

There was a consultative and scoping study that involved mobilizing and building interest among potential stakeholders. The study included a situation analysis aimed at capturing knowledge, attitude and practices; a stakeholder analysis aimed at

determining the skills, weaknesses, strengths and opportunities of different stakeholders that also helped identify the potential roles stakeholders could play in addressing issues related to milk value chain and potato productivity. Stakeholders began to understand and trust each other, and recognise expertise and assets different actors could contribute. A schedule of meetings was agreed upon to evaluate the season and to plan for the following season based on inputs from regular monthly meetings at IP level. Country meetings brought the IP stakeholders together, while the monthly IP meetings concerned only those stakeholders who were more active in day-to-day activities of the IP. Both monthly and seasonal meetings at the IP and Rwanda site levels acted as an important tool of interaction between stakeholders.

IAR4D Integrates the Learning that Stakeholders Achieve through Working Together

Different activities were conducted by Mudende IP stakeholders on milk value chain and Irish potato production. To improve milk production and marketing, training was provided on milk postharvest handling, fodder production and postharvest handling. Demonstration plots were developed to promote multiplication of improved fodder species. Exchange visits were organized to support learning through others and famers were linked to markets to improve their marketing activities. The IP members were encouraged to construct cowsheds. The local government, in collaboration with Rwanda Development Bank (BRD), supported construction of a milk collection centre.

Potato production was supported by the development of demonstration plots. Farmers got training on potato seed production and selection. Stakeholders involved in this activity were farmers, IMBARAGA (farmer confederation) and Rwanda Agriculture Board (RAB). Exchange visits supported the interaction between farmers, BAIR (local NGO), IFDC and RAB. The IP facilitated construction of a greenhouse for the production of potato mini tubers.

The various activities addressing the issues of low milk yield and marketing and that of low yield of Irish potato contributed to changes in attitude and behaviour of individuals from different categories of stakeholders. As a result the average milk yield went from 2 litres/ cow/day to 5 litres/cow/day; the price of milk went from 80 RwF/litre to 140 RwF/litre. The average yield of Irish potato went from 9 tons/ha to 20 tons/ha.

IAR4D Integrates Analysis, Action and Change across the Different Dimensions of Development

The Mudende IP has contributed to the sector by establishing agricultural infrastructure such as a milk collection centre and a greenhouse that produces potato mini tubers. Furthermore, by creating IP sub-groups in different locations in Mudende, farmer are transformed from their traditional agriculture to business-oriented farming. Farmers are benefitting from changes in practices—by confining their cattle to cowsheds, IP members obtain organic manures to improve soil fertility, use biogas to reduce the drudgery in collecting firewood and protect the environment; they also planted grasses along hedgerows to control soil erosion and produce fodder. The IP insisted on women's and youth participation in all activities. Two out of the five executive committee members and 12 out of the 23 sub-group leaders were women.

IAR4D Integrates Analysis, Action and Change at Different Levels of Spatial and Social Organization

The new ways of working in the IP have contributed to improvement in implementation of government programmes, such as Community-based Health Insurance (CBHI), Crop Intensification Programme/ Land Use Consolidation (CIP/LUC) and the Livestock Intensification Programme (LIP) in Mudende. This resulted in Mudende sector being ranked first in Rubavu district for achieving its performance contract in 2013-2014.

Changes at Different Levels

By working with people of different backgrounds and organizations, farmers have become open minded, business-oriented and have a clear vision of their future in a context of limited access to capital and land resources. Also, by adopting technologies and innovations leading to increased yields and livestock production, individual farmers have been able to improve their household incomes. Extension agents used to only address efforts of farmers with regard to technology adoption. However, extension agents involved in IAR4D processes have realized that technologies are easily adopted when users have a level of ownership in the process. They also realized that mere increase in productivity does not improve livelihoods of rural farmers, but that this should include inputs from other actors along the value chain.

Lessons Learned

Hard core technical researchers have now begun to appreciate the role and value of social scientists' ways of identifying and working on the real needs of smallholder farmers. Social scientists have improved their skills by exchanging ideas with other stakeholders in the IP.

CHAPTER **04**

Innovation Platforms and Capacity Development:

An ongoing debate

Although recognizing the comprehensive nature of the FARA concept paper in outlining IAR4D principles, Mbabau and Hall, still claimed three years after its publication that there was still a "considerable degree of ambiguity" regarding what IAR4D or AR4D actually is (Hall et al., 2012). A year later, Buruchara et al. (2013) described IAR4D as an evolving approach. Given the broad-based disciplinary genealogy of the concept, it is not surprising that these authors find diverse interpretations and operationalisation of the concept. On the one hand, AR4D/IAR4D is seen as a partnership or multi-stakeholder-based protocol for conducting research, as opposed, on the other, to a farmer-centric, or farming systems approach in line with participatory research. Mbabau and Hall, however, interpreted IAR4D rather in line with the FARA concept paper, "as a fundamental shift towards a systems-oriented approach to learning, innovation and capacity development." This understanding is also in line with much of the literature on Agricultural Innovation Systems (AIS) where IAR4D belongs (Tenywall et al, 2011).

A key channel or tool adopted by many development programmes and research organizations, particularly in sub-Saharan Africa, to operationalize the IAR4D principles or AIS approach, has been the establishment of 'innovation platforms." Indeed, one often gains the impression that innovation platforms and IAR4D are synonymous. An innovation platform may be seen as a multi-actor configuration deliberately set up to facilitate and undertake various activities around identified agricultural innovation challenges and opportunities –at individual and organization levels (Kilelu et al., 2013; Ngwena and Hagmann, 2011). Sutherland (2011) underscores that the stakeholders are committed to collaboration, including taking risks and committing resources.

A central role in innovation platforms is played by facilitators or brokers who take on the role of intermediary to enable stakeholders with diverse, possible conflicting,

perspectives and interests to network and learn together in order to create new knowledge and identify joint solutions, i.e. innovate around an identified challenge (Leeuwis and Arts, 2015; Laurens et al., 2009). This solution may be technical or a new product, process or structural arrangement. The concept of facilitation goes beyond conventional facilitation tasks – such as, communication and information sharing, listening, convening actors and managing logistics – to include the fostering of synergy by managing systemic interactions that link people and resources and enhancing their ability to make collective decisions and implementation.

As a consequence, much of the debate on IAR4D and AIS in recent years has concentrated on the establishment and functioning of innovation platforms and strengthening these through skilled facilitation. Capacity strengthening or development, central to achieving IAR4D at individual, organizational and institutional levels in an integrated manner, has focused on the interaction of IP members as capacity strengthening and bringing about changes in the institutional arrangements. "Use of IPs is seen as an intervention whereby an attempt is made to build the capacities amongst the different actors in the innovation process and to change the institutional environment in such a way that these actors can share ideas and resources to learn and innovate"(Mur and Nederlof, 2012). IPs may indeed be viewed as an example of what Hall has termed "capacity development-led innovation" (Hall et al., 2010). While IPs, usually established at local levels rather than regional or national level, bring about learning and, hence, capacity development within the members, without concerted and conscious efforts to simultaneously develop the capacity of the organisations that individual members come from or to enable cross system learning through a learning architecture, capacity development at organisational and institutional level is the ad hoc outcome of a "trickle-up" effect. Or worse, failure to simultaneously address issues of capacity at organisational level may even block processes of innovation within IPs.

A Systems Approach to Capacity Development

Capacity development is a key component or even driver of IAR4D; as such, efforts must not be spared in developing comprehensive training programmes to enhance innovation. Just as the concept of IAR4D calls for a shift in the way agricultural research contributes to development results, an innovative and systems-oriented approach to capacity development is required (Mbabu and Hall, 2012) if IAR4D is to significantly strengthen innovation potential.

The AU/NEPAD Capacity Development Strategic Framework defines capacity development as a *"process of enabling individuals, groups, organizations, institutions and societies to sustainably define, articulate, engage and actualize their vision on developmental goals building on their own resources"* (NEPAD, 2010). Capacity is generally viewed as the ability of individuals, organizations or society as a whole to set and implement development objectives as well as to identify and meet development challenges in a sustainable manner (Land, 2000).

The emphasis is on process and from a systems perspective, capacity development is not a one-off intervention, but a continuous process of upgrading and change and coping with change and uncertainty (Mbabu and Hall, 2012). Capacity is seen to 'emerge' over time, influenced by multiple factors both internal and external (local, national and international), formal and informal (Watson 2010). No single factor or constituent element – incentives, leadership, financial support, trained staff, knowledge, or structure – can by itself lead to the development of capacity.

Current approaches to capacity development are grounded in complexity theory (Lucas, 2013) and are, therefore, very much aligned to the systems approach to agricultural innovation. Capacity development, understood as a multi-dimensional and multi-actor process that goes well beyond the transfer of knowledge and skills at the individual level, encompasses organizational and institutional dimensions (Pearson, 2011), recognizing a complex interplay between these dimensions[3] from which capacity emerges. These dimensions are interconnected and affect each other in complex ways through push and pull factors. A further dimension of "networks and partnerships" can also be distinguished (SADC, 2006). Given the central role of building networks and partnerships for AIS, there is a strong argument for embracing this fourth level as a dimension of capacity. While the inter-relationship of the three dimensions (individual, organizational

[3]'Institutional' refers to the formal and informal rules as well as beliefs, values and frameworks for understanding that create stability and order of the system. This is often referred to as the "enabling environment"

and institutional) of capacity is recognized, it is unclear how strengthening individual competencies and organizational capabilities through either traditional interventions or through the creation of links among all actors in the "innovation system[4] can be achieved (Watson, 2010).

Also, while the aim of capacity development interventions may be strengthening the ability of individuals, organizations and the whole system to perform assigned tasks in an effective, efficient, and sustainable manner, improved performance cannot be seen as a proxy for capacity. The connection between capacity and performance is somewhat murky and seldom immediate (Mizrahi, 2006; European Commission, 2012). Investments in capacity can take months or even years to yield significant results. The internal environment within an organization and system as well as external factors will all influence performance and hence capacity (Horton, 2003).

Oritz and Taylor (2008) pointed out the need for capacity and capacity interventions to go beyond improving immediate performance and to develop what they termed "standing capacity". In order to adapt to new and constantly changing environments, to learn and analyze internal and external context and to relate and build partnerships, individuals, organizations and systems, capacity building should be well beyond that which is used on specific projects each day. If organizations (or institutions) are only prepared for limited results and immediate programme needs, then they are not preparing systemically. Developing the capacity of a system – such as AIS – with its actors, incentives, norms, processes etc., is paramount if results are to be achieved. A systemic approach to capacity development is therefore not just about 'delivery of results', but facilitating processes to enable stakeholders seize opportunities, build trust and take joint actions (Ministry of Foreign Affairs of the Netherlands, 2010). As such, capacity development can be seen as the continual pursuit of resourcefulness, enabling actors in the system to respond with flexibility and adaptability to changing circumstances and to act decisively and with effect.

Thinking is, however, generally quite sparse on how to achieve a systems approach to CD for AIS involving multiple actors and creating synergies between individual, organizational and institutional dimensions. The SSA CP set up capacity development programmes geared at achieving its results in response to the agenda agreed on with its donors. To mainstream IAR4D, a more comprehensive capacity development programme which will be all encompassing is required. It is however clear that setting a comprehensive agenda for capacity development may not be the call of several research

[4] Such interventions include providing the professional skills, incentives, and resources to develop partnerships and businesses; improving knowledge flows; and ensuring that the conditions that enable actors to innovate are in place..

and development projects and until national programmes start using this approach, comprehensive programmes may be difficult to find. Linking research and development outcomes and achieving the necessary shift in mind-set and approach, however, means that specific new skills and management systems are needed for diverse actors to perform effectively within dynamic, multi-actor development processes and can respond to emerging challenges.

Capacity development for IAR4D, in particular must facilitate the creation of synergy between research institutions and public and private sector actors and development organizations and enable innovation actors to address a whole range of activities, investments and policies that make change happen, while improving the way the different elements work together, take action and ensure iterative learning of the innovation system, continuously revisiting performance and how it is managed. This goes far beyond the establishment and achievements of Ips.

Within AIS, much of the debate is on defining an understanding of "capacity to innovate" that encompasses all dimensions of capacity development and creates a standing capacity of individuals, organizations and of the system as a whole to adapt and respond to unforeseen challenges. Hawkins et al. (2009) and Mbabu and Hall (2012), in elaborating on the principles of IAR4D identified the foci of capacity development to enhance the innovation process. According to Mbabu and Hall, these include:

- **Organizational and systems focus:** This includes building links between different organizations and promoting collective action and tackling the enabling environment of the system through policy and institutional change.

- **Hard and soft skills focus:** In addition to hard skills and competencies that relate to their core business, organizations also need to build soft skills such as the ability to work in partnership with other organizations and stakeholders or the ability to reflect on performance and share lessons as well as manage conflict.

- **Focus on institutional development:** Policy and institutional arrangements are key to shaping the innovation process and are, therefore, a key component of capacity. An effective innovation capacity is one that can generate the policy and institutional changes needed to enable other forms of innovation.

- **Facilitation rather than training:** Organizations need to be facilitated to explore their goals and performance and to develop their own effective ways of working.

- Strong focus on learning and performance management

- **Capacity development as a dynamic, ongoing process:** Learning-by-doing, reflection and adaptation as key elements of capacity building, both at organizational level and system level as a whole and are essential ways of coping with change and uncertainty.

- **Need for organizations with an intermediary role:** The systems perspective on capacity building also points to the need for actors with a role in facilitating links between entities are often referred to as innovation brokers and represent a key component of capacity.

The Common Framework for Capacity Development (Ekong et al., forthcoming) in Agricultural Innovation Systems of the Tropical Agricultural Platform (TAP), an initiative of the G20, suggests that the functional capacity to adapt and respond in order to realize the potential of innovation, shifting focus from reactive problem solving to co-creating the future consists of four core, functional capacities. These capacities need to be achieved at all dimensions of capacity development in an integrated manner requiring not only skilled facilitation but also strong facilitative leadership. The core capacities are:

Capacity to navigate complexity to comprehend the larger system to achieve a shift from mainly reductionist understanding of the parts, to systemic understanding of the relationships between the parts, viewing change as an emerging property that cannot be predicted or planned for in a linear fashion and the ability to embrace ambiguity.
Capacity for collaboration, enabling actors to understand each other's perspectives, resolving conflicts and diversity in order to combine individual skills and knowledge, and create an awareness of their complementarity; building synergetic partnerships and networks to enhance collaboration.

Capacity for reflection and learning, bringing stakeholders together, designing and leading processes of critical reflection and following double-loop and triple-loop learning processes, leading to action and change; this requires respect for different opinions and an atmosphere of trust for those opinions to be voiced. It also requires a systematic tracking of processes and progress to enable reflection to take place.

Capacity to engage in strategic and political processes. CD for transformational change is inherently political, and involves questioning the status quo. Power relations need to be understood for a number of dimensions, including: economic interests, balance of power among elites, and civil society-state relations. Understanding and influencing the

politics and power relations between individuals, within organizations and in the wider society, is crucial for bringing about new forms of interaction among stakeholders. It includes the conscious empowerment of vulnerable and often marginalized groups.

Capacity development interventions therefore should aim at facilitating multi-stakeholder processes to develop capacity at institutional or system level to create a synergy that is more than the sum of its parts. This includes at individual levels orientation in analytical skills (systems thinking, complexity theory, stakeholder analysis, gender analysis etc.), strategic planning skills (participatory planning, reflexive monitoring and evaluation, development of theory of change), soft skills (leadership, team building, conflict resolution, negotiation, listening skills, communication) and learning skills (participatory action research). Organizational and systems' capabilities require conducive incentives, relevant structure and political commitment in order for stakeholders and organizations to acquire and effectively share knowledge as well as collaborate. This implies that stakeholders, organizations and the system as a whole should have the ability to:

- continuously identify and prioritize problems and opportunities in a dynamic systems environment;
- take risks, experiment with social and technical options, and assess the trade-offs that arise from these;
- mobilize resources and form effective partnerships around promising options and visions for the future;
- Organize mechanisms to bring stakeholders together and facilitate their interaction in order to access, share and process relevant information and knowledge and collaborate and coordinate with others and achieve effective concerted action (Leeuwis et al., 2014).

These capacity to innovate must therefore be achieved through a learning architecture that links individual initiatives, such as innovation platforms horizontally and also vertically to enable system wide learning and achieve sustainability and scale of the innovation process (Burns and Worsley 2015). Adekunle et al. (2014) suggested that such system-wide learning could be achieved through a system of nested IPs at local, regional and national levels. A similar approach of nested IPs is suggested in Mwangi and Koinange (2012) in a field guide to managing local innovation platforms.

CHAPTER **05**

Institutionalization of IAR4D Concept:

From the time IAR4D was introduced, FARA had great expectations that it is an approach to research and development that could provide solution to the prevalent problem of non-adoption of agricultural technologies leading to low returns on investments in research. It was dubbed "doing business in an unusual manner" to emphasize the amount of organizational learning and unlearning that was envisaged before the idea becomes common place. Organizational learning as a concept has attracted several definitions, some of which sometimes conflict and overlap. However, Wiseman (2007) provided a succinct depiction by describing organizational learning as a cyclical process through which knowledge that is learned at an individual or group level is objectified on the organizational level, institutionalized and embedded in the organizational memory. This definition portrays institutionalization as a consummation of organizational learning.

Institutionalization itself involves a deliberate effort to incorporate knowledge at the organizational level so that it may persist and be available for future use. Crossan et al. (1995) opined that institutionalization is the process through which the learning that has occurred by individuals and groups is embedded in the design of the systems, structures, and procedures of the organization. They added that it is through institutionalization that individual and group learning is leveraged and capitalized on in an organization. As a concept, it exists because there is a practice which comes to occupy praxis in the evolution of change. It therefore subsists in a scenario of change. In the case of IAR4D, the desired change involves a total or gradual change of the approach used for the delivery of output, outcomes and impact in agricultural research and development. All these were captured as doing business of agricultural research and development in an unusual manner.

So many authors have looked at the change process and have described it in different ways. Fullan (1991) has demonstrated that the change process consists of a series of three overlapping phases: initiation, implementation, and institutionalization.

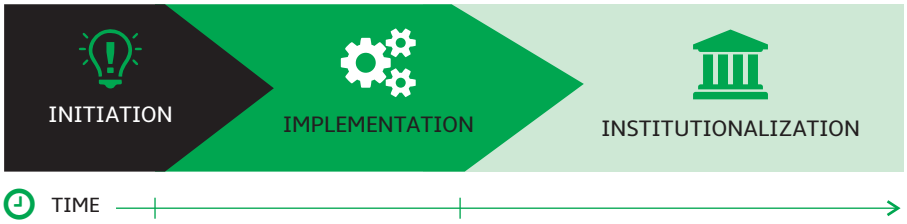


Figure 1: The three overlapping phases of the change process (Miles et al., 1987)

Where a change is desired to be institutionalized, it should first be implemented; before it is implemented, it has to be initiated. The three phases are, however, not discreet, as they represent a continuum leading to institutionalization. Crossan et al (1999) also looked at the process of change and further broke the implementation phase into two and articulated a model of organizational learning called "the 4I framework" which identified four main steps, namely:

Intuiting, described as the identification of ideas, ways of thinking or action from their present or the practice by others around them that could potentially be used to improve their current work experience;

Interpreting, which describes the process of putting ideas, ways of thinking, or action into use;

Integrating, that is, the process that follows interpreting—as the interpretation process moves beyond the individual and ideas become embraced by the group, integration occurs; and

Institutionalization, which "is the process of making new ideas, ways of thinking or acting recurrent and have a sufficiently significant impact on organizational action. This, in other words, is the process of embedding the learning made by individuals and groups into the institutions of the organization that has occurred in individuals.

1. Recognizing the need for change
2. Planning and formulating solutions
3. Initiating and implementing the resulting plans, and
4. Institutionalizing or terminating the results

Lawrence et al. (2005) added that institutionalization is the process that distinguishes organizational learning from individual and group learning as it is through this process that ideas are transformed into institutions of the organization and then made available to all employees. Another model (Levin 1980) based on a study of innovation and change at the State University of New York, is structured around a four stage process:

The model essentially separated the recognition of the need for change and the process of planning and formulating solutions from the whole process of tagged initiation by Miles et al. (1987). Silimperi et al. (2002), in developing a framework for institutionalization of quality assurance, also propounded a five-step process which included awareness, experiential, expansion, consolidation and institutionalization. This framework essentially retains the stage of initiation as awareness, while that of implementation was broken into experiential, expansion and consolidation before institutionalization sets in.

Institutional Theory

In recent times, institutionalization, as a theory to explain systems in social sciences, has permeated academic circles in an effort to explain changes in institutions and organizations. Greif (2005) defined 'institution' as a system of rules, beliefs, norms and organizations that can jointly generate a regularity of behaviour in a social situation. Integrated Agricultural Research for Development deals with the institutions that support and sustain research and development infrastructure, on the one hand, and those that provide essential services to the process of the development and use of technologies for the perpetual derivation of socioeconomic benefits, on the other. The former institutions include the rules that govern the organization of research and development, development of strategy, rule of engagement and reward of actors, selection of partners, prioritization of research and development agenda for resource allocation, and career development. The latter institutions focus on organizations for research, extension, farmers, input delivery, processing, transport and output marketing. These latter set of institutions paramount to the delivery of impact in IAR4D have been categorized into three: producer organizations, research and extension organizations, and private sector players, covering inputs, service and output marketing. Some other classifications consider farmers as bona fide private sector players, thereby projecting

IAR4D as a unique case of Public-Private Partnership in ARD. From the definition, it is clear that institution is guided by some inherent factors which give it the distinguishing characteristic it portrays.

Two concepts have been variously associated with institutionalization. These are the concept of "legitimacy" and that of "taken for grantedness". In the first instance, it is important to note that every practice, rule, belief or norm that now looks like a commonplace attitude has its origin as an invading practice before it got integrated. Every belief therefore has to be "legitimatized" before it gets to the point of being "taken for granted" (Colyvas and Powell, 2006).

Suchman (1995:574) defined legitimacy as "a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions." Legitimacy, therefore, derives from widely shared world views which usually come through nudging or pressure from within or outside the system. Nudging is usually based on activities of protagonists, cultural nuances or legislative applications. The key factor here is that legitimacy is conferred on a practice when practising it does not bring the feeling of being an outlier, a social outcast or a deviant. Legitimacy has been looked at as an important component of institutionalization by various authors. In several of these discourses, many features have been mentioned.

Baum and Oliver 1992 pointed out that legitimacy is upheld by relation embeddedness which portrays the extent to which a practice is in use within an organizational field. They also pointed out the importance of how diffusion generates interdependence and self –reinforcement. Another feature of legitimacy is related to how it is derived. This drew a distinction between socio-political legitimacy where practices or rules are either permitted, mandated or sanctioned by law of the state and cultural cognitive legitimacy where ideas are more constitutive, with emphasis on sense making.

"Taken for grantedness" as a concept means "to consider a new concept or procedure as true or real." In short, this translates to accepting a concept as true without testing or questioning it, a concept which has been central to institutionalization for many years (Zucker, 1977; Jepperson, 1991). Therefore, while "legitimacy' captures assurance on how the society sees a new practice, taken for gratedness goes a step further to capture how the practising agency sees the new practice. In other words, the presence of legitimacy only confers the environmental condition that could take new practice to the point where it could be taken for granted. Taken-for-grantedness as a feature of institutionalization is the extent to which practices become embedded in organizational routines and become largely unquestioned.

Institutionalizing the Concept of IAR4D

The process of institutionalizing the concept of IAR4D must be subjected to analysis from two dimensions. It would be interesting to know how the practice enjoys the legitimacy of agencies regarded as "outsiders" as much as knowing how the process itself has been taken for granted by players in the ARD community of practice. In doing this, we will be using the framework for change developed by Myles et al. (1987) where three phases were identified: initiation, implementation and institutionalization—this is in realization that an intruding idea has to be initiated and implemented before it could be institutionalized. What is more, the success or otherwise of each stage determines the progress of the next. If a preceding stage has not been successfully established, the succeeding one will not take off smoothly and the total process of institutionalization will be aborted.

Initiating the Process of IAR4D

Several meetings expressed the frustration of ARD players and of donors alike about the non-adoption or slow adoption of improved technologies, which could otherwise transform the lives of farmers in Africa. In response to this, FARA convened a meeting to address the issue and propose the concept of IAR4D to improve the process and accruable benefits. IAR4D proposes to improve the derivation of socioeconomic benefits by increasing the rate as well as the quanta of technologies adopted in a setting where the players have an opportunity to interact physically or virtually. The kernel of IAR4D that was initiated after this widely attended meeting was crystallized in a project and later accepted by CGIAR as the Sub Saharan Africa Challenge Programme (SSA CP).

The fact that the proposal was made by FARA, with its linkages with the AU and its formidable constituency in Africa, including CORAF, ASARECA, and SADC (now CCARDESA), farmers' organizations, private sector players and educational institutions, gave the proposal the highest level of legitimacy obtainable on the African continent. The next hurdle was on how the new concept would enter into praxis to the point that it is taken for granted by all and sundry. Of necessity, this had to be derived from an analysis of the initiation and implementation of the idea.

Initiation of IAR4D

Stakeholders in the development of this book testified to the fact that FARA did not only notify players in the ARD community of practice, which naturally included CGIAR and NARS, about the potential benefits in changing to IAR4D, they also carried donors along in the process. Respondents indicated that this was done through a well-prepared project document, followed by series of visitations and capacity development programmes. These efforts collectively increased awareness of ARD players and of donors about the urgency of the necessity to change the approach used for ARD in Africa.

FARA organized capacity building programmes across the continent and used them as to spell out the goal of IAR4D as well and the process and the strategies to implement in the sub regions. Each player knew its roles and responsibilities and how all the activities will be carried out. Most importantly, FARA was able to raise enough resources through huge widespread donor interest in the programme. All these culminated in the development of the **Inception Programme** which was meant to establish the research and development framework for the **implementation phase**. The generation of the required fund as much as the development of the programme for the Inception Phase left nobody in doubt not only about the intuitive belief in the superiority of IAR4D but also of the readiness of FARA to support the implementation phase.

Implementation of IAR4D

The implementation of IAR4D commenced with the implementation of the Inception Phase which planned to have basic research and development infrastructures that would make the process of institutionalization easy and attainable.

Coordination

Implementation programme was to be steered by the Sub-Regional Organizations (SROs), namely, CORAF for West and Central Africa, ASARECA for East and Central Africa and SADC for Southern Africa. This was with the initial purpose of not just ensuring that the sub-regional organizations developed the capacity to implement the new concept but also that they transform into hubs for the dissemination and institutionalization of the concept in the post-implementation phase. In the end, each SRO worked with different CGIAR centres in coordinating the activities in their sub-regions. Thus, CORAF in West and Central Africa worked with IITA as the coordinating partner and with IITA, ILRI, IFDC and NARS as implementing research partners. In East Africa, ASARECA worked with

CIAT as the coordinating partner and with CIAT, ICRISAT, AVRDC, and several NARS and universities in the sub-region as implementing research partners. In Southern Africa, SADC worked with IITA again as the coordinating partner and with CIMMYT, CIAT, AVRDC, Bioversity, several NARS and universities as implementing research partners.

Stakeholders adjudged that this is a good spread which covers not just the NARS, but also universities, CGIAR and association of non-CGIAR centres. This forms a solid base for spreading the idea and achieving institutionalization over a large number of research organizations. It may be argued that the CGIAR group was better favoured in that they emerged as co-coordinators of the sub-regional efforts; they also had the comparative advantage not just in manpower and skills but also in financial resources with regard to research on the continent. Through this partnership between SROs and different partners, many players were able to get necessary capacity building for the implementation of IAR4D, see IAR4D in practice, and get a first-hand knowledge and experience of its benefits.

FARA also introduced the concept of Research and Development Management Team to ensure quality control at the level of implementation and coordination. These were composed at the sub-regional levels and made up of trusted and distinguished scientists from the continent and from the respective sub-regions. This set of distinguished actors added to the robustness of the infrastructure to guide implementation. Unfortunately, this function was lost when the structure was scrapped to reduce overhead cost.

Postdoctoral Fellows

The implementation plan involved the engagement of six post-doctoral scientists to assist with general implementation and motoring, but specifically on process monitoring and impact assessment. They worked in pairs in each of the sub-regions. These scientists were selected from institutions within the regions where they worked and were also accommodated by selected institutions referred to as 'host institutions' where they integrate with other colleagues to aid experience sharing. They were heavily supported with capacity building, mentorship and supervision from world class scientists, including those from Advanced Institutions for Agricultural Research. Through this process, FARA expected that the post-doctoral scientists will be exposed to the new concept and become knowledgeable in the implementation of IAR4D, become useful in disseminating the concept in the hosting institution and take the concept back with them to their institutions when they finish the programme.

Nationally Recruited Scientist Program

Besides the Postdoc program, FARA also implemented the Nationally Recruited Scientists Programme (NRS) through which work in each sub-region was supported by six scientists selected from various backgrounds and institutions within the sub-region get enlisted to support the research and development work on IAR4D within the sub region. The NRSs were recruited from partner-institutions and stayed within their institutions. Like Postdocs, they were expected to start to crystalize the process of institutionalization after implementation.

Core Research Support Team

FARA also implemented the Core Research Support Team Programme to provide additional support to the research and development teams across the continent. These were scientists of different skills and disciplines brought together to provide specific support to the team. Although this programme was more important for the proof of the concept and the rigorous research and development activities entailed, it also helped to provide additional support to post docs and other partners thereby consolidating the foundation for institutionalization.

Degree related Capacity Building:

In addition to the postdoctoral and NRS, FARA also used the opportunity of the programme to provide degree-related training opportunities to students, majority of whom were from African countries. Through this programme, students benefited from programmes leading to Masters and PhD in areas related to IAR4D. This also contributed to the pool of scientists that now constitute the critical mass that provide intellectual support to the implementation of IAR4D continent-wide.

Non-Degree related Capacity Building

Besides the degree-related capacity development programmes, FARA implemented a number of non-degree related programmes to enhance the capacity of stakeholders to implement IAR4D. These covered both soft and hard skills required to work in teams and jointly develop ARD programmes as well as those required to adopt new technologies and promote impact. The multi-dimensional capacity building approach used covered the pyramid of capacity needs to ensure that all aspects of needs by every shade of participating stakeholders were captured. Following this approach, capacity was developed not only for scientists and extension officers but also for farmers, private sector players and policymakers. Members of the private sector covered included those

for inputs and outputs markets. Within each category of stakeholders, needs were mapped out and capacity developed for different hierarchies. For example, within the research group, capacity development programmes covered not just the scientists working on the field but also their technicians and research managers. This was to lay a solid foundation for institutionalization.

Programme of work

Following the demand by the Science Council of the CGIAR for a robust and rigorous scientific proof of concept using impact assessment of technologies, FARA had to consolidate both its tracking of processes as it captured the indices of impact. These indices provided necessary answers to questions that are asked when assessing the robustness of implementation as a precursor of institutionalization. These questions include: what process did the implementation take? What behaviours were exhibited in the early stage, mid-stage and at full implementation by various implementing groups? What are the needs of the implementers? What professional learning and lessons are there? What are the results of implementation? And how do we improve outcomes? The postdoctoral fellows were of great assistance in this process.

Institutionalization

The implementation commenced in the three regions and originally started with 27 innovation platforms. These platforms progressed at different rates, but after two years, a definite pattern was evolved. Figure 2 shows the general pattern exhibited by the platforms after two years.

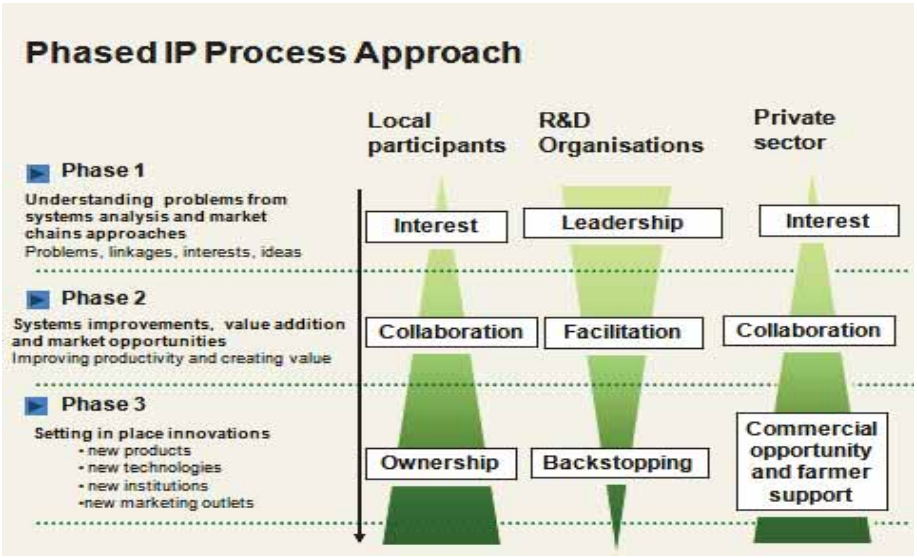


Figure 2: Three Stages of Maturation and their Characteristics

Figure 2 shows that innovation platforms moved from phase 1 to 3 in the course of implementation. In phase 1, key partners from the farming communities and the private sector started to show interest, whereas by the time they got to phase 3, they had started to take ownership. It was observed that maturation of Innovation Platforms progressed with experience and this advanced with the number of years. Whereas, not many Innovation Platforms were mature after two years of assessment, the figure dramatically increased at another measurement that took place after four years of implementation. Maturation comes from a complete understanding and acceptance of the new concept, which are two necessary conditions for institutionalization.

Early elements of institutionalization

As the Innovation Platforms advanced, many of them started to show elements of institutionalization. The Bubaare Platform in Uganda improved the shelf life of Bubaare drink from sorghum, registered it nationally and regionally and placed it on the shelf across the region as a beverage drink. The group went ahead to legally register as a new multipurpose cooperative society (Makini et al., 2013). Although the players were aware that cooperative societies normally have more restricted roles than innovation platforms, which are built to operate in a more versatile version, they settled for registration as a cooperative society because that was the more convenient body known in the books at the time of registration which was needed for the registration of their new product.

Innovation platform, as a nomenclature, was still nonexistent and the group needed to be registered before they could register their product. Be this as it may, the act of registration symbolized a significant step towards institutionalization which was consummated by the presence of the product in supermarkets across the region. As a result of the legalization, the IP was able to help its members gain the official standard certification from the Uganda National Bureau of Standards, allowing the farmers various products to be sold to higher-end markets in Uganda and beyond. Legalization has also enabled the farmers in the Innovation Platform to do business with suppliers and customers on a larger scale while also improving their access to other services, such as loans. Consequently, the sorghum supply contract signed with Huntex Ltd has quadrupled the production of sorghum by farmers.

Cadilhon and Dedieu, in a review of the Innovation Platforms in 2011, deduced that this innovative legal framework for an IP will be particularly useful as a precedent for other countries sharing a common law and judicial tradition, in addition to other existing legal statuses for multi-stakeholder commodity associations.

Another element of institutionalization could be distilled from the interaction of farmers with the private sector selling inputs in one of the Platforms in Malawi. The Platform saw input sourcing as a major hindrance to the adoption of high yielding varieties of vegetables and went ahead to co-develop what is known as the "vegetable box", which contains all the inputs required by a farmer to plant an acre of land. This development increased the cultivation of vegetables and pushed the income of farmers and that of private sector players. This box was the unifying factor that bonded the group over a period when the programme had a cash flow problem.

Elements of institutionalization could also be seen in the decision of some governments to create offices for the coordination of certain innovation platforms coordinated by IITA in northern Nigeria. Through this office, constant infrastructural support, including the provision of motorcycles for greater extension reach, was provided to the groups. Another indication of institutionalization is the integration of elements of IAR4D, its soft and hard skills and mode of implementation into the curriculum of universities like Makerere University in Uganda and other universities under the RUFORUM across Africa.

More importantly, several organizations integrated IAR4D into their programmes, and developed programmes funded by different donors for implementation in Africa. The donors include EU ACCORD and other NGOs. Besides, the whole of CGIAR institutionalized the concept and integrated its principles into three different CGIAR programmes, namely, Humid Tropics, Dry Lands, and Aquatic Ecology. In addition, FARA and its sub-regional organizations had the concept as their main operational principle. Convinced donors enforced compliance by tying financial support to the institutionalization of the concept.

Consequently, several countries adopted the concept for their research programmes, some with competitive grants tied to its implementation (like the case in Nigeria), while others like Uganda, The Gambia and Malawi adopted it wholly or as component of the agricultural transformation of their countries. By the time the proof of the concept was delivered in 2014, more than half of sub-Saharan African countries had either wholly accepted the concept or were piloting it for consideration.

Institutionalization: *The case of The Gambia*

The Gambia is located on the west coast of Africa, and has a total land area of 10,689 square kilometres. The agricultural sector is the most important sector of the Gambian economy, contributing 32% of the gross domestic product, and providing employment and income for at least 75% of the rural population. The livestock sector contributes 29.6% to the agricultural GDP and 8.6% to national GDP. The activities of the various livestock value chains along the production, processing, marketing and services provide livelihood opportunities to rural, peri-urban and urban populations. About 54% of the land area in The Gambia is arable (540,000ha), out of which about 39% (188,000ha) is currently farmed mainly by subsistence farmers. About 81,000 ha are irrigable, out of which 45,360ha is in the Central River Region, and 35,640ha in the Upper River Region. Currently, less than 2,000 ha of this potential area is under irrigation

New Framework for measuring IAR4D

From the experience in the Gambia, we can summarize that the process of institutionalization of a concept like IAR4D must actually commence with awareness of the concept. Awareness leads to the desire to experiment with it and experience it at a pilot level, leading to a phase of lessons learning and expansion and finally we have a phase of institutionalization.

Phase	Illustrative characteristics	Potential strategies or activities	Indication of readiness to progress
Awarene ss	Decision makers become conscious of need to make changes in ARD; Money is available to start initiating and piloting; Manpower also available to do the work	Seminars; Journal articles; or visits; training	Deliberate decision of management to explore use of IAR4D to improve impact; Availability of resources to progress. Mobilization of human resources Capacity building Inclusion on program
Initiatio n and Piloting phase	Determination of area and commodities and partners Pilot ing IAR4D	Pilot IAR4D, develop mechanism to learn lessons;	Development of strategy for piloting and getting the resources required for operations; Existence of evidence of superiority; Availability of resources
Expansio n phase	Strategic expansion of areas under IAR4D in scale , and scope	Develop a strategy for expansion, Capacity building and leadership development	Consensus among decision makers that IAR4D continues to show superiority; Continued prioritization Compensation package for scientists developed Resources available

Consolidation phase	Improving capacity to implement IAR4D, strengthening existing activities, modify procedure, provision of additional tools to enhance efficiency	Identify great needs and design programmes to fill capacity ; Draw lessons and improve efficiency	Integration into activities of Organizations ; Development of tools to enhance efficiency. Sustaining commitment to proceed Resources to continue
Institutionalization	IAR4D becomes routine practice	Continue to refine process	Continued prioritization Capacity building entrenched

The climate is "Sudano-Sahelian" with a short rainy season from June to October and a long dry season from November to May. Mean annual rainfall varies from 900mm in the southwest to about 500mm in the northeast. Additional water resources comprise inflow of the River Gambia and two aquifer (the exploited shallow and the underutilized deep) systems underlying the entire country. River Gambia is the main source of surface area water for irrigation. The river, because of tidal influence, is subject to saline intrusion in the western part of the country, thereby requiring an effective water management strategy in order to ensure sustainable increase in agricultural productivity.

Through the influence of FARA, The Gambia gained awareness of the concept, experimented with Innovation Platforms, and established a number of platforms across the country for various commodities. These platforms proved to be superior to other approaches used in the country in increasing yields, inputs and outputs market access; increasing income, job creation; and reducing poverty. Today, Innovation Platforms have not only been accepted, they have been out-scaled to cover the whole country for different commodities.

Lessons

The Gambia has followed a trajectory slightly different from those followed by other countries but which has made it to have a better understanding of the process of institutionalization. The first lesson from the case of institutionalization of the concept in the country is in the transformation of the pilot sites into regional and national sites. In the Gambia, pilot innovation platforms were rebuilt from the villages to the regional

level, with each region having an innovation platform for each of the selected commodities.

The Gambia set up Innovation Cells at the village level using demography and gender to achieve better homogeneity and learning. Thus for each village, there are four cells for each commodity. These are cells for young men, old men, young women and old men. They help facilitate learning, particularly of technical issues which normally take place at the farm level. These cells are aggregated to the next level of administrative structure which is the district. At the district level, there are also four groups called Innovation Clusters. These follow the demographic and gender principles used for the cells at the village level. The Clusters are melted together to form the Innovation Platforms that are rooted at the regional level but responsive to strategic direction from the Ministry of Agriculture. These platforms at the regional levels are working towards becoming companies to meet the needs of farmers.

The second lesson is that the new concept must be built on the gains of the old. In the Gambia, stakeholders practised Farmers Field Schools (FFS) and have developed several documentations on this before they embraced Innovation Platforms. The FFS training structure was used to strengthen delivery of technical training at the cell level for all the platforms. The only difference, however, was the segregation into the groups which FFS did not have.

Another lesson is the digitalization of farmers and documentation of progress made from season to season. The Gambia has all farmers registered electronically on each platform with data constantly collected on parameters related to farm size, inputs use and output attained. This enables the ministry to identify farmers needing extra assistance in service delivery.

Yet another lesson is that the government can provide support in the form of services where certain stakeholders are not present or do not have the capacity to provide what the platforms require. The country does not yet have enough private sector players with strong muscles in the inputs sector. So the government provides support to fill this gap. For example, it has boldly supported farmers in importing fertilizers into the country to support Innovation Platforms. In addition, the process of institutionalization requires the presence of a champion. In the case of The Gambia, there are champions not just within the research system but also in the extension department, who worked together through the process of institutionalization.

Conclusion

Integrated Agricultural Research for Development is a different way of undertaking research and ensuring that it attends to development problems. When it was introduced by FARA, it generated a lot of enthusiasm not only among researchers and development workers but also among donors. It was generally regarded as an approach that "does the business in an unusual manner". Because of the promises that it holds for African agricultural development, FARA ploughed it into use, opening up opportunities for its institutionalization. Institutionalization of an idea is normally preceded by the initiation and implementation of that idea. FARA planned to use its programmes based on IAR4D to create opportunities for a wide range of stakeholders as a means of getting the idea understood by partners, thereby leading the path to its institutionalization.

From inception, FARA introduced the idea of IAR4D through series of stakeholder engagements at national, regional and continental levels. This was complemented by a comprehensive capacity building programme to enable stakeholders understand the principles and benefits that it brings. When the Challenge Programme commenced eventually and it was time to set up research and development infrastructures for its inception phase, FARA ensured that partners from a wide range of stakeholder organizations were engaged to serve within the structures created.

As the Challenge Programme progressed into full research implementation, more structures were created to enhance the institutionalization of IAR4D. Structures were created to enable the sub-regional organizations coordinate activities within their respective sub regions. This singularly made the approach become a tool for agricultural development within the sub-regions. Other structures like the Postdoctoral Research Fellows' Scheme, Nationally Recruited Scientists' Scheme, Core Research Support Team, Degree Related Capacity Building Scheme, and the Non-degree Related Capacity Building Scheme reinforced institutionalization at the country level.

Creation of the structures was helpful in providing basic framework on which institutionalization could thrive, but the most helpful was the implementation of IAR4D itself and the fact that it enabled stakeholders feel the benefits in the form of economic transformation. As was reported by stakeholders, platforms moved through three phases leading to the point where local participants and private sector players take ownership and start to benefit from commercial opportunities coming from supporting one another on the platforms. This marks the beginning of complete understanding and acceptance of the concept, which are two necessary conditions for institutionalization at the community level.

Many of the platforms set up under the Challenge Programme have started to show signs of institutionalization. These included the existence of legal instrument of operation, existence of binding economic products like the Mamera and the Vegetable Box. Many of these provided lessons which were ploughed into the situation in the Gambia where further lessons have been learnt on the institutionalization of IAR4D. Additional lessons on institutionalization from the Gambia include the necessity of creating country-wide structures for the Innovation Platform, the necessity of building new Platforms on old concepts like the Farmers Field Schools, support from the government to provide services required of private sector, especially where the sector is fledgling, and the presence of local champions for the course. These experiences have informed the development of a new 4-staged framework for measuring IAR4D, namely, awareness creation, initiation, expansion and consolidation. The illustrative characteristics, potential strategies or activities and indication of readiness to progress from one stage to the other have been well described.

CHAPTER **06**

Conclusion

Integrated Agricultural Research for Development was proposed by the Forum for Agricultural Research in Africa as a new approach for undertaking research for development and ensuring that results from research activities are adopted by end users more quickly and in greater quantity. FARA packaged a research proposal aimed at implementing IAR4D across the continent and presented it to CGIAR as the Sub Saharan Africa Challenge Programme. Since the inception of this programme, FARA has contributed to the debate on IAR4D, starting with the publication of what is now called the first white paper which details critical principles which IAR4D should be based upon. The implementation of SSA CP provided ample opportunities to share learning and experiences. At the same time, it also provided a great opportunity to reflect on the original principles and assess how relevant they had been in the implementation of the continent-wide study. This paper provided answers to the issue of how relevant the principles had been for the study. Realizing that IAR4D, as an approach, requires a framework for implementation, FARA introduced the Innovation Platform as a framework through which innovative partnership could be brokered.

Foreword

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