

# **A Framework for the Integration of Diverse Learning Approaches: Operationalizing Agricultural Research and Development (R&D) Linkages in Eastern Africa<sup>1</sup>**

Laura German and Ann Stroud

## **Abstract**

Operationalizing research and development (R&D) within a fluid continuum encompassing both understanding and application can be a daunting task. This paper presents a typology of distinct learning approaches designed to operationalize research-for-development. It summarizes lessons for achieving quality within each approach, and for their integration into a fluid continuum of theory and practice. A set of cases is presented to illustrate the critical importance of each learning approach and their integration in practice. The paper concludes with a discussion of implications for institutional arrangements and partnerships that may best enable the application of the approach within everyday R&D practice.

*Keywords:* Action research, eastern Africa, research methods, natural resource management, research for development, agricultural research

## **Introduction**

Despite many decades of development-oriented research, global challenges to economic development and social justice are today as great as ever. While knowledge generation is but one contributing factor to development outcomes, researchers are being held increasingly accountable to concrete outcomes by both donors and end users (Meinzen-Dick et al., 2003). This is because while research in some fields has yielded significant advances for human health and welfare, in others its impacts have been limited despite considerable investment (Hammersley, 2004; Meinzen-Dick et al., 2003). The limited impact of research can be traced in large part to the institutional disconnect between research and research methods on the one hand, and development practice on the other (Agbamu, 2000). As stated by Hammersley:

“There are times when we initiate inquiry ... without having been stimulated by a practical problem. Moreover, science and philosophy have become institutionalized; in other words, they are specialized occupational activities that are carried out outside the immediate context of other activities – and they therefore generate their own intellectual problems. Even where they are oriented towards providing knowledge relevant to some practical issue, they do not usually form an immediate part of courses of action directed towards dealing with that issue ... Recognizing intrinsic relevance as a stimulus to inquiry points to the possibility of a much looser relationship between research and other kinds of activity” (2004:170).

In addition to the institutionalized separation of research and practice, one sees greater status awarded to theory over praxis within Greek and Western philosophy. The institutionalization of research as a specialized form of inquiry and the negative backlash to action research within the scientific community are both evidence that this distinction is alive today (Hammersley, 2004). Challenges faced in operationalizing research-for-development are therefore embedded in broader historical and institutional contexts which shape the nature of institutions, scientific inquiry, and roles and responsibilities in knowledge creation.

Action research is increasingly seen as a promising approach for improving the impact of research on development and change (Baker and Benjamin, 2000; Dick, 2002; Hagmann and Chuma, 2000; Hammersley, 2004; Reason and Bradbury, 2001). This is envisioned in multiple ways, ranging from the new definition of

---

<sup>1</sup> Article in press: German, L. and A. Stroud (in press). A Framework for the Integration of Diverse Learning Approaches: Operationalizing Agricultural Research and Development (R&D) Linkages in Eastern Africa. *World Development*.

research objectives and methods to the reformulation of roles (from outsider observer to participant, individual to collective). Yet while action research is gaining ground in Western academic establishments, it has yet to take hold with international research and development circles in terms of its perceived validity, funding levels, and the degree to which it has been institutionalized in educational, research and development circles. At the same time, empirical research for development continues to be defined according to principles of intrinsic relevance, and the mechanisms to link results to the intended decision-makers remain poorly defined. With the notable exception of the health sector, where research outputs (medicine) have clear implications for development, failure of much research to contribute to notable development outcomes has caused many practitioners to marginalize the role of systematic inquiry in their development practice. These trends and disconnects stem in part from the historical disconnect between research and practice (Hammersley, 2004), which has institutionalized the lack of concern, methods and skills for bridging the divide within both research and development circles. Yet confusion also stems from the fundamental tension between theory and practice, which requires the subordination of one relative to the other in the short-term when making funding decisions and defining priority objectives and actions (Hammersley, 2004).

This article presents a framework and approach for linking existing learning approaches to strengthen the knowledge base of development and change processes. A series of case studies serves to illustrate how diverse learning approaches may jointly contribute to development outcomes in practice. While largely grounded in the fields of agriculture and natural resource management, the framework is likely to have widespread relevance and appeal as an approach for linking research and development across a range of fields. The cases illustrate how, independent of your starting point (research or development, action or empirical research), each learning approach generates questions most suitably answered by other complementary approaches when directly applied to development problems. The need for, and mechanisms to enable, a stronger integration among research and development and the learning approaches that characterize each is the subject of the pages that follow.

## **A Typology of Learning Approaches for Agricultural Development**

In the development context, research assumes an instrumentalist orientation that requires the learning process to serve practical or political goals directly (Hammersley, 2004). This is not to say that there is no intrinsic relevance to research or that “basic” research has no value, but that research-for-development implies contributions to concrete development outcomes. For this to occur, the contribution of research can be defined in three fundamental ways. These forms of research-for-development can be roughly equated with existing research approaches and the respective objectives, methods and skill base that ensure quality ‘learning’ within each.

### **PARTICIPATORY ACTION LEARNING: EMPOWERING CHANGE**

The first way in which research has a fundamental role to play in development is in empowering the actors themselves (individuals, communities, institutions) to identify key development bottlenecks, and to experiment with different approaches for addressing and ultimately breaking through them (Barnsley and Ellis, 1992; Kelly et al., 2004; Trout et al., 2003). This requires a *participatory, iterative* form of research that is embedded in local communities (or other actor-based contexts) and internalized or owned by the actors themselves. While many action research practitioners would argue that this learning approach can alone lead to real development impact, it is argued here that more formal forms of strategic research to identify broader structural constraints and to enable cross-site learning among regions is complementary to such participatory forms of learning.

This form of actor-based learning and empowerment has been well-documented through the literature on participatory research, experiential learning, social learning and participatory action learning (Fals-Borda, 1988; Maarleveld and Dangbégnon, 1999; Röling and Wagemakers, 1998). We choose the term “participatory action learning” (PAL) to encompass the less formalized, actor-based learning grounded in shared experience found within each of these traditions. PAL may be carried out within R&D institutions as a process of institutional change, or by local communities as they seek solutions to common problems. The approach is composed of iterative cycles of institutional or community-level action and reflection that empowers by

placing the nexus of development strategizing in the hands of the beneficiaries themselves. Increasingly, PAL approaches are utilized within social learning contexts, where multiple actors collectively construct meanings (problem definition, objectives) and work collectively toward solutions (Maarleveld and Dangbégnon, 1999; Pretty and Buck, 2002). Methods for ensuring quality in PAL include simple planning and monitoring frameworks, effective facilitation and an inclusive change process that effectively integrates broad-based concerns and perspectives.

## ACTION RESEARCH: UNDERSTANDING CHANGE

A second way in which research can contribute to development is in enabling a better understanding of the key elements to successful processes of development and social change. Such process-related research can aid in understanding barriers encountered, and ways to overcome these, when trying to decentralize decision-making, foster market-oriented production, reform policies and institutions, enable stakeholder negotiation, or foster collective management of natural resources (Hagmann, 1999; Percy, 1999; Sanginga, 2004). Key research questions focus on *how* things were done to enable successful outcomes, including key bottlenecks encountered, how they were addressed and the derivation of key elements of successful change processes. The ultimate objectives of such research may be to advance theory, to improve the effectiveness of the specific change process in which research is embedded, or to influence development practice more broadly through distillation and dissemination of general lessons and principles. While such lessons can be derived through retrospective analysis, deeper lessons can be gained through more *interactive* forms of research grounded in actual experiential learning and change processes. This is due to tendency to lose information through recall, and the need to distill lessons from a thorough understanding of challenges encountered in action, the elements of successful and unsuccessful means of addressing these challenges, and continuous capture of the views of the actors involved.

These forms of research contributions to development are well-documented in the action research literature. As defined by Lewin (1946) and Dick (2002), action research (AR) is a flexible spiral process which allows action (change, improvement) and research (understanding, knowledge) to be achieved at the same time. Most authors would agree that action research shares the following common elements: a collaborative process between researchers and people in the situation; a process of critical inquiry; a focus on social practice; and a deliberate process of reflective learning (Argyris et al, 1982). Action research has been employed to enable change in the classroom (Elliott, 1991; Stenhouse, 1975), industry (Coghlan et al., 2004), agricultural extension services (Hagmann, 1999; Percy, 1999), on farm (Hagmann and Chuma, 2002), in environmental management (Gardner, 2003), urban communities (Kelly et al., 2004) and public health (Basu, 1996; May et al., 2003). The research dimension aids in documentation and systematization of lessons as target activities are implemented, monitored and adjusted through time, providing answers to the questions, “What works, where and why?”

As AR is superimposed in time on PAL, the two are generally considered a single approach – “participatory action research.” While the term “PAL” suggests an ability to group PAL and AR into a single research paradigm, differentiation of the two concepts is useful for several reasons. First, while individuals may be skilled in both areas, the skill base needed for effective facilitation in PAL is distinct from that required for effective systematization of experiences from the PAL process that is required for AR. In the former, a personal commitment to social change, effective communication and group management, and social awareness of group dynamics are valuable skills. In action research, while the former skills may strengthen observations on power dynamics and development process, research skills (documentation, validation, synthesis) are also crucial. Secondly, the immediate goals of the two differ. While in the former the primary aim is development impact (enabling localized social or institutional change), in the latter the most immediate aim is research – or the systemization of experiences to inform theory or derive general principles of application beyond the immediate actor arena. Herein lies the fundamental contradiction highlighted by Hammersley (2004). Yet rather than resolve this contradiction through the subordination of either action or research on action, here the attempt is to differentiate among them and see how they can be logically and operationally linked. Third, an important distinction is made between action research designed to address localized problems, in which local actors or beneficiaries own the learning process and formalized data collection is minimal, and that designed to answer “higher-level” questions of strategic importance to development practice beyond the specific case at

hand – in which the process of inquiry is often more specialized or formalized. Finally, those action research proponents seeking to defend action research’s claims to validity believe that the research process must be recoverable through an explicit intellectual framework (framework of ideas, methodology and area of application) that will serve as a basis for determining which findings count as knowledge (Checkland, 1991; Checkland and Holwell, 1998). The interest in recoverability of an AR process clearly sets AR as “research” apart from PAL as “action”.

## EMPIRICAL RESEARCH: INPUTS TO DECISION-MAKING

A third way in which research contributes to development is through characterizing situations in a way that provides a reliable knowledge base to ground development strategies. Several examples help to illustrate the broad range of contributions which fall under this umbrella. For policy interventions, research can aid in enhancing our understanding of the impact of different policies on desired outcomes, for example the impact of different land tenure systems on natural resource management practices. Biophysical research may be required to gain objective understanding of cause-and-effect – for example between land management practices and water resource degradation – so that stakeholder negotiations can be depoliticized through a concrete understanding of the sensitivity of key indicators (i.e. water discharged from springs) to changes in system parameters. Similarly, social research into the influence of diverse institutions on poverty and resource access can help design institutional reform processes. Finally, a systematic understanding of the relative merits of different approaches (for example, for rural health care or technology dissemination) or of primary development bottlenecks (technology, information, markets, credit) can aid in the formulation of better-targeted development strategies.

While interactive or participatory methodologies may aid in capturing such knowledge, more *extractive*, empirical research methods rooted in the positivist tradition are often required to gather quality data due to the level of sophistication of methods or the need to control for the influence of extraneous influences on that which is observed. Different from action research, empirical research follows well-known standards for academic rigor and uses controlled experiments and/or replicability to stand behind a validity claim (Checkland, 1991; Checkland and Holwell, 1998). Methods are defined up front based on a pre-determined information gap and, where broader implications are to be drawn, a theoretical proposition. While research methods are often ‘pre-tested’, modification of methods once data collection initiates runs contrary to scientific principles. While researchers and end users may jointly define research objectives, research design and data collection is generally done by thematic specialists. Data capture is systematic and is held constant across replicates. Empirical research methods vary according to the objectives and standards for research quality within the field of interest (biophysical science, social science, other).

While these design principles do not alone run contrary to development objectives, the tendency for research questions to be defined by researchers alone based on theoretical interests. If empirical research is to play a role in social change within particular contexts, the aims of research must clearly target development outcomes. This brings in the need for a “filter” to differentiate information crucial to decision-making from that which is marginal. The question of critical uncertainties, and who defines these, is paramount. In some cases, researchers or project personnel may define the research questions according to key information gaps which will enable them to better target interventions or to understand program impacts. In other cases, local actors will define critical information gaps according to their priorities or the need to resolve contradictory understandings at the local level. While in some cases the end users of information may participate in data collection, their most crucial role is in problem definition and the provision of research parameters.

Table 1 summarizes the authors’ proposition on the characteristics of each of the three learning approaches that set them apart from one another and provide opportunities for a more pluralistic approach to learning within agricultural R&D.

**Table 1.** Characteristics of Diverse Learning Approaches as Operationalized within AHI

<b>Learning Approach</b>	<b>Roles in Defining the Research &amp; Learning Agenda</b>	<b>Characteristics of Research Design</b>	<b>Primary Role in Designing &amp; Managing Research</b>	<b>Research Outputs &amp; Applications</b>
<b>Participatory Action Learning</b>	<b>Immediate Beneficiaries</b> (who integrate lessons into the change process through periodic reflection and re-planning)	Informal; goals and pathways for achieving goals defined at outset but not rigidly adhered to; ‘data’ capture largely informal.	<b>Immediate Beneficiaries</b> (whether local communities, institutional representatives or policy makers)	(1) Approaches that ‘work’ relative to the end goals of a development or change process as defined by immediate beneficiaries (2) To guide a change process and strengthen chances of success through systematic reflection and self-learning
<b>Action Research</b>	<b>End Users</b> (immediate beneficiaries or off-site users of results); <b>Facilitators</b> (who may wish to generalize results)	Semi-formal; research questions defined at outset and fixed; methods of data capture may be relatively fixed or opportunistically defined to capture emergent realities.	<b>Researchers</b> (highly specialized expertise required to manage research for quality, and to generate lessons and principles relevant to a wider audience)	(1) General principles about development and change processes, including the conditions under which diverse outcomes are reached (2) To help guide the development or change process on / within which research is conducted, or to generate general principles of relevance to managers of change in other locations with similar conditions
<b>Empirical Research</b>	<b>End Users</b> (decision makers at diverse levels: resource users, development organizations, policy makers); <b>Researchers</b> (who identify a problem not prioritized by end users but perceived to be instrumental to development outcomes)	Formal; Research questions and methods defined at outset and held constant; data capture is systematic and is held constant across replicates.	<b>Researchers</b> (highly specialized expertise to generate reliable, valid research findings in diverse fields)	(1) Conclusive statements about the subject of inquiry (2) Applied to guide decision-making and as inputs to other learning approaches

## **The Case for Methodological Pluralism in Agricultural R&D**

While action research is gaining momentum in the development arena as a means of enhancing the relevance of research and learning to development, it is often posed as an alternative rather than complementary learning approach to empirical research and positivistic epistemologies. This is seen as much in overt statements about its superiority in bringing change (McTaggart, 1992), as in the language used to define action research. Statement such as, “action research dissolves the distinction between doing and using research” (Wadsworth, 1991) and, “by involvement in research we do not conduct research and then act on it” (McClintock et al, 2003), made in the context of expounding the merits of action research, suggest a superiority of action-based research in bringing about change.

The case studies presented in this paper illustrate how an understanding of the relative merits of diverse learning approaches by the actors involved in a change process leads to a more fluid assimilation of new approaches as needs arise in any given development or change process. While the role of each was in some cases defined a priori, new demands arose in each case that required either unanticipated use of an alternative learning approach or the integration of new phases of approaches that were planned from the outset. Repeated patterns of this demand for new learning approaches emerging through other approaches suggest that failure to integrate PAL, AR and empirical research in most development programs results more from the shortcomings of the facilitator than from any inherent deficiency in any of the three approaches in contributing to real development impact. New information needs invariably suggest (research) questions that lend themselves to particular modes of inquiry, or for which each of one or more forms of inquiry will give unique knowledge contributions. We now turn to the program context and empirical evidence for how these learning approaches are functionally linked in practice.

### **Methodological and Program Overview**

#### **PROGRAM CONTEXT: THE AFRICAN HIGHLANDS INITIATIVE**

The case studies that follow emerged through an initiative aimed at developing new methods and approaches to strengthen the relevance of the agricultural research establishment in eastern Africa for achieving economic development and sustainable use of natural resources. Research was conducted under the rubric of the African Highlands Initiative (AHI), and ecoregional programme of the Consultative Groups for International Agricultural Research and a network of the Association for Strengthening Agricultural Research in East and Central Africa. AHI works in a set of benchmark sites in the highlands of Ethiopia, Kenya, Uganda and Tanzania that provide the testing grounds for new practices, and at the institutional level within the National Agricultural Research Institutes (NARIs) themselves. Key partners in this work include NARIs, national extension services, government ministries and NGOs.

Until 2003, AHI emphasized farm-level technological innovation in conjunction with farmer institutional development processes. Systematic inquiry emphasized biophysical parameters and farmer evaluation of participatory on-farm research. Following 2003, a shift was made to landscape-level research and interventions when AHI was given the task of operationalizing participatory integrated watershed management. An emphasis on this higher scale caused a shift in focus from single commodities and their interaction with their immediate environment to higher-level ‘system’ goals (balancing production of diverse commodities with nutrient and water conservation) and a shift from an emphasis on individual gains to balancing individual with collective goods. This led to the testing of a host of new approaches, and to new demands for research. AHI facilitation of institutional change processes within partner NARIs has continued independent of this shift, with thematic foci shifting as a function of broader trends and discourses (leading most notably to a shift from participatory research to integrated agricultural research for development).

#### **METHODS DEVELOPMENT IN PRACTICE**

Given prior shortcomings of the agricultural research establishment in making empirical research results relevant or accessible to the ultimate decision-makers, from early on AHI emphasized alternative forms of research engagement. One of the program’s premises was that to have to have impact, research must either be

participatory and action-oriented. With the exception of AHI's institutional change work, in which documentation and reflection were aided by an experienced facilitator, formal inquiry on questions of process (the 'action' dimension) was limited and researcher-farmer interactions emphasized the participation component.

The shift to landscape-level research catalyzed shifts in the research focus due to new demands for understanding. The emergence of a host of new methods for understanding and engaging in the system led to a need for a deeper understanding of process, and the need to attribute outcomes with specific methods. This shift led to two fundamental changes in how AHI conceives of research. First, it led to a differentiation of participatory and action research, the first emphasizing the process of farmer empowerment to enable them to address identified needs, and the latter the process of formal inquiry that would enable higher-level synthesis of lessons for off-site users. Second, it led to a demand for empirical research. This took three forms: empirical research in social science during the diagnostic phase to assess how different local interest groups prioritize issues; impact assessment; and biophysical cause-and-effect (most notably to set clear benchmarks for decision-making within multi-stakeholder negotiations).

This evolution of the program has had a profound influence on research planning. Whereas early on research questions were left undifferentiated in terms of the specific learning approach best suited to the question and how diverse approaches are sequenced, the relevance of all learning approaches and how they are articulated within local and wider change processes is now made explicit at the planning stage (see Table 2). This up-front planning does not however preclude new stages of any one of these approaches entering into the R&D continuum as new needs emerge, as illustrated in the cases studies which follow. Research instruments to further operationalize each of these learning approaches have also developed over time, as illustrated by the following generic framework developed to structure action research planning and observations by facilitators and action researchers for any given change process:

### **Action Research Guide for Program-Level Action Learning and Process Documentation**

#### *1. Prior to any activity or step:*

Objective: What is the program trying to achieve through this activity?

Approach: What will be done to achieve the objective, and how?

Plan for M&E: What is going to be observed and documented as you go?

#### *2. Following any activity or step:*

Approach: What did you actually do to achieve the objective? (modifications of the approach in practice and reasons for modifications)

Successes: What went well, and why?

Challenges: What did not go well, and why?

Findings: What were participants' suggestions on the way forward? What you're your own observations about the process?

Lessons: What lessons or insights can be derived from these experiences? (on the approach and on your findings)

#### *3. Prior to any further activities or steps (re-planning):*

Recommendations: What would you do the same and differently next time?

## **Case Studies**

In the pages that follow, a set of case studies is presented to illustrate how self-evolving R&D processes have created demand for each learning approach and, therefore, synergies and complimentaries between them. Cases were selected to illustrate change processes in which the role of each learning approach is planned ahead of time and those in which the need for complementary learning approaches has emerged during implementation. They are also selected to illustrate the role of diverse approaches in fostering the changes required at diverse levels (community, district, organization, national policy) for more far-reaching development to occur.

## CASE STUDY 1: NICHE-COMPATIBLE AGROFORESTRY

The first case study focuses on AHI's experiences developing new approaches for participatory watershed management in the eastern African highlands. It gives a general overview to the approach, but focuses in on one dimension of this work – addressing the perceived incompatibilities of trees in certain landscape niches. This case illustrates how integrated learning approaches may be nested in time and space, enhancing niche compatibility in agroforestry within an overarching participatory watershed management approach.

Improved natural resource management at landscape or watershed scale presents several challenges. First, the interests of diverse groups and interactions among them must be acknowledged and managed so that interventions do not favor some groups at the expense of others. Second, gains to diverse landscape-level components (trees, crops, livestock, water, soil) must also be managed given that strong trade-offs often exist. While participation is essential to manage such a complex agenda, it also must be managed so that different groups have a voice in the choices and outcomes. Thus the key role of effective facilitation in balancing diverse and often contradictory agendas, and action learning approaches to foster adaptive management of biophysical innovations as well as social change.

Table 2 highlights the planning done in one of AHI's benchmark sites (Ginchi) located in West Shewa Zone, Ethiopia. While not shown here, an empirical research process was used to systematically consult diverse social groups (by gender, wealth and age) to identify and rank key watershed problems. A set of priority problems was synthesized by consolidating a larger set of issues and conducting a participatory ranking exercise. Issues with strong functional relationships (i.e. in terms of nutrient flows or hydrological interactions) were grouped into two clusters which structured subsequent R&D interactions with watershed residents. In each cluster, trees were found to be incompatible with different landscape niches, most notably causing the drying of springs and competition with adjacent crops. As these problems were found to be common across all AHI benchmark sites, substantial investments have been made on minimizing niche incompatibilities in agroforestry and related conflicts. In Ginchi, limited land cover resulting from extensive deforestation in recent decades coupled with a failure to respond through the cultivation of trees on farm have caused an extreme shortage of fuel wood, exacerbating soil fertility decline through the use of cow dung and crop residues for fuel. A key challenge in this site was therefore to integrate more trees into the system without further exacerbating the problems resulting from current agroforestry practices.

The standard approach is to base afforestation purely on individual farmers' demands (tree species and numbers), or to simply promote the species that are available by development agencies. The problem with these approaches is that they fail to consider the trade-offs of different tree species, or to consider the niches where different species are compatible. In each of the sites where this problem has been addressed, the AHI approach can be divided into approximately four steps.

### *(i) Identification of niche incompatibilities*

While a number of problems associated with agroforestry were identified during watershed diagnostic exercises, a methodology was developed to systematically explore the tree species that are compatible and incompatible with different landscape niches, as well as the properties that define each species' compatibility (German et al., in press). The methodology may be classified as empirical research in social science, as it utilized local ethnobotanical knowledge to identify niches, identify tree species that are and are not compatible with each niche, and to identify the properties that determine species' compatibility.



Table 2. Planning Framework for Integrating Diverse Learning Approaches in Research and Development

Major Activity / Step	Objective	Development Intervention (PAL)	ACTION RESEARCH QUESTIONS	EMPIRICAL RESEARCH QUESTIONS
<b>Watershed Diagnosis</b>	To identify major watershed problems from the perspective of local residents.	<i>Primary Research Question:</i> What are effective, equitable processes for participatory diagnosis and planning for watershed management? 1. Focus group discussions by gender, age, wealth and landscape position to identify key watershed problems, and opportunities and barriers to their resolution. 2. Program-level planning. 3. Participatory watershed action plans.	1. What is an effective approach for planning at local & program level? 2. How can problem diagnosis be balanced with the need for immediate impact, so as to keep community interest high?	1. What are watershed priorities by gender, age, wealth & landscape position? 2. What are key opportunities and barriers to addressing identified watershed problems?
<b>Soil &amp; Water Conservation and Management</b>	To enhance the positive synergies between water, soil and tree management in micro-catchments.	<i>Primary Research Question:</i> How can NRM practices (SWC structures, tree planting, drainage systems, etc.) enhance agricultural productivity through decreased erosion while also enhancing spring recharge long-term? 1. Spring development with spring management plans (responsibilities, rules, sanctions). 2. SWC structures and niche-compatible afforestation to control erosion, enhance water recharge & minimize income loss (from soil, seed & fertilizer loss). 3. Social organization, negotiation & local policy reform for integrated catchment management.	1. If a high-priority entry point (spring development) is used, will outcomes of future R&D investments be greater? 2. What are the necessary conditions for people to invest in a shared resource? 3. What are effective approaches for reaching the overall cluster objective(s)?	1. What is the impact of chosen SWC measures on run-off, soil & nutrient loss, & infiltration? 2. What are farmers key indicators for SWC, and how do these change over time? 3. Which trees are compatible with different niches? How do prioritized tree species perform in different niches?
<b>Integrated Production &amp; Nutrient Management</b>	To improve farmer incomes and system productivity (crops, livestock, trees) while enabling sustainable nutrient management.	<i>Primary Research Question:</i> How can income be improved through increased agricultural productivity (crop, livestock, tree and nutrient management) and marketing while also enhancing system nutrient stocks? 1. Scale out tested crop varieties with integrated nutrient management, training, and group organization for sustaining farmer-to-farmer spillover. 2. Introduction of improved feed and livestock husbandry practices. 3. Quantify total fuel needs to minimize use of dung for fuel (system nutrient decline), and identify viable solutions (fuel-efficient stoves, afforestation).	1. What is an effective and sustainable approach for scaling out tested varieties & integrated nutrient management technologies? 2. What are effective approaches for improving livestock & feed production, minimizing system nutrient loss, and meeting fuel needs without system nutrient depletion?	1. How can soil fertility be maintained while increasing farmer income through increased production & value addition (seed potato)? 2. Which varietal & integrated nutrient mngt. practices perform best in Galessa watershed?

### *(ii) Multi-stakeholder engagement*

The next step was to identify stakeholders in “problem niches” and engage them in negotiations for more optimal niche management. This enables an interest-based approach to problem-solving, ensuring that groups with the highest ‘stakes’ are jointly engaged in decision-making. Stakeholder identification was done using a constructivist approach, in which randomly selected individuals were interviewed until there was substantial repetition in answers given.

Discussions were first held with individual stakeholders (as groups or individuals, depending on how ‘stakeholder’ is defined for each issue) to share findings on watershed problems, problem niches and stakeholders, and to elicit their opinions on the nature of the problem and the required solutions. This was at times done by project personnel, and at times through involvement of local elders or leaders. They were asked to participate in a meeting with other stakeholders where the problems would be jointly addressed. The draft agenda was shared with them at this time to enable each stakeholder’s input into the process of engagement itself, to increase their willingness to participate in a situation in which latent conflict had caused communication to break down.

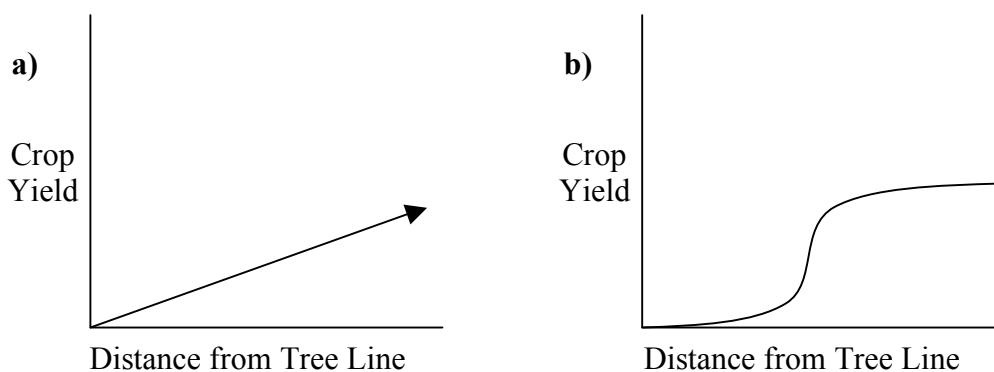
Finally, each stakeholder group was invited to a multi-stakeholder meeting where research findings were reiterated and each stakeholder asked to present their views. Niche compatibility criteria of each stakeholder were presented to encourage the participants to identify alternative tree species that would fit the needs of each stakeholder rather than the land owner alone. For example on farm boundaries, growth rates and characteristics of timber might be the primary criterion of the land owner while competition with adjacent crops might be the key criterion of affected farmers. After reaching an agreement on substitute species that effectively integrate the interests of each interest group, technical and policy dimensions of implementing these solutions are developed. These have included community nurseries, joint planning for the felling of trees so that it does not harm crops during the growing season, and design of local byelaws to ensure compliance with agreed norms (i.e. bans on certain tree species in certain landscape niches).

### *(iii) Empirical research to ‘validate’ local knowledge and identify ‘thresholds’*

At this stage in time in this process, empirical research has been seen as a necessity for either ‘depoliticizing’ negotiations or mustering political support for more widespread implementation. While empirical research results can be useful in cases where different stakeholders disagree on cause and effect, this has generally not been the case in AHI. More often, there has been a need to utilize biophysical research to bolster external political support for an emphasis on improved governance in agroforestry. For example, for policy enforcement agencies to consider revising byelaws at district level from experiences in pilot watersheds, it is necessary to use empirical data on cause and effect. Research teams in Tanzania are therefore quantifying the effect of tree lines on adjacent cropland for Eucalyptus and other species seen as harmful to crops. These experiments will provide clear scientific justification not only for increasing emphasis on niche compatibility within forestry programs, but for setting benchmarks for byelaw design. If clear thresholds are identified in the effect of boundary trees on adjacent cropland (Figure 1, scenario b.), for example, then byelaws can be designed to specify the minimum distance at which these trees should be grown relative to farm boundaries.

### *(iv) Determine the role of research findings on decision-making and outcomes*

While the processes has not yet evolved to the final stage, AHI is interesting in capturing lessons from the ultimate application of empirical research findings so that they may be shared with R&D actors throughout the region. Such ‘higher-level’ questions address the role of empirical research in guiding decision-making at diverse levels, as well as the outcomes on the ground (i.e. the effect of boundary trees on livelihoods of neighboring farmers). This will enable the generation of a road map for similar district-level institutional and policy reforms in other regions. This stage of the process clearly lends itself to action research, given the need to move beyond action to the synthesis of lessons for off-site users and the need to embed research in change processes.



**Figure 1.** Impact of boundary trees on the yield of adjacent crops in cases with (a) and without (b) thresholds

This case illustrates a fluid transition from empirical research to characterize situations (watershed diagnosis and niche compatibility assessments) to change processes building upon the lessons from the diagnostic phase with an action research ‘overlay.’ Empirical research was again integrated into the change processes as needed to guide decision-making of local and district actors, and a future phase of development intervention (use of empirical research findings to drive change) envisioned at local and district levels – with action research to distill key success factors and guidelines for other R&D actors wishing to learn from AHI pilot experiences. Table 3 summarizes the contribution of diverse learning approaches to address niche incompatibilities in agroforestry in AHI sites.

## CASE STUDY 2: POLICY REFORMS IN UGANDA

The second case study involves a coalition of research and development organizations in southwest Uganda working to operationalize principles of grassroots empowerment and equity under a national policy that decentralizes agricultural extension services – the National Agricultural Advisory Services (NAADS). NAADS, first implemented in 2002 in a series of pilot sites, falls under Uganda’s Plan for the Modernization of Agriculture (PMA). NAADS’ vision entails a decentralized, farmer-owned and private sector-serviced extension system that contributes to the PMA vision of a more market-oriented, specialized and privatized agricultural sector. Principles intended to guide the implementation of NAADS include: a) a pro-poor focus, b) more effective service delivery, c) market-oriented production, d) farmer empowerment, f) gender mainstreaming, and sustainable natural resource management (NAADS, 2000). Given the breadth of aims and what some would argue to be inherent inconsistencies between a competitive, market-oriented development model and principles of equity and sustainability (deGrassi and Rosset, 2003), the challenges posed by such a policy shift are significant.

During the pilot phase, sub-counties were asked to select NGOs to assist in sensitizing farmers about NAADS, in farmer group registration and in agroenterprise selection. When this process came to an end, contracted organizations felt the process had created more questions than answers. Farmers voiced concern over the need to prioritize single enterprises given the complexity of their farming systems and production goals, while NGOs were concerned about lack of clarity on how to integrate “cross-cutting principles” (gender, equity, sustainability) and ensure farmer representation. A district-level dialogue was initiated and a shared vision emerged, leading to the formation of the Coalition for Effective Extension Delivery (CEED). CEED’s original aim was to enable demand-driven development in Kabale District, and to derive broader principles from these experiences for subsequent dissemination to other development actors. The Coalition’s immediate focus was to operationalize the NAADS framework through a participatory action learning (PAL) process at the local level, enabling farmers to identify and address structural and procedural bottlenecks hindering effective realization of the NAADS vision. However, efforts to engage the NAADS Secretariat in the work of CEED from early on created an opportunity for influencing policy at the national level.

**Table 3.** Framework for Integrating Diverse Learning Approaches in Niche-Compatible Agroforestry

Major Activity / Step	Objective	Development Intervention (PAL)	ACTION RESEARCH QUESTIONS	EMPIRICAL RESEARCH QUESTIONS
<b>Watershed Diagnosis</b>	- Same as above (Table 2) -			
<b>Identification of Niche Incompatibilities in Agroforestry</b>	To identify landscape niches where trees are causing problems, and tree <i>species</i> and <i>characteristics</i> that are compatible and incompatible with the niche.	<i>Primary Research Question:</i> What tree properties and species are seen as incompatible with different landscape niches?		1. What trees are seen as incompatible with which landscape niches, and why?
<b>Multi-Stakeholder Negotiations</b>	To identify and engage stakeholders in “problem niches” to negotiate more compatible tree species and/or management practices.	<i>Primary Research Question:</i> How can stakeholders with divergent interests be effectively enabled to minimize conflicts and niche incompatibilities in agroforestry?	1. What are the necessary conditions for groups with divergent interests to be able to come together to resolve conflicts and niche incompatibilities? (technological and policy).	1. What are the (local and external) interest groups associated with each niche?
<b>Identify ‘Biophysical Targets’ to De-policitize Negotiations and Target Solutions</b>	To identify biophysical thresholds that might be utilized to shape technical and policy solutions.	<i>Primary Research Questions:</i> What impact do different tree species and their location on the landscape have on crop yield and water discharge in micro-catchments? What factors affect the usefulness of this information in shaping solutions?	1. How useful is the identification of biophysical thresholds in de-politicizing stakeholder negotiations and shaping management and policy decisions? On what does this depend?	1. What effect do [Eucalyptus] tree lines have on yields of adjacent crops? 2. How does tree species selection and distribution influence watershed function? 3. Are there thresholds in tree-crop or tree-water interactions that provide clear ‘policy targets’ for niche-compatible agroforestry?

The process of policy influence passed through four key stages: problem identification; a pilot PAL process to address priority bottlenecks to effective policy implementation; advocacy with NAADS Secretariat; and a NAADS-commissioned study of farmer institutional development in Uganda to verify national relevance of findings and shape policy.

*(i) Problem identification*

The Coalition’s first step was to systematically document the concerns that diverse actors had about the NAADS process. This was seen as desirable because of its ability to capture priority issues that are situation- or actor-specific. The activity was carried out at the local level, where wealth, age, gender and related activity domains and levels of political prestige were seen as factors likely to influence what priority issues emerge, and at other levels within the NAADS structure where one’s position (role in implementation, what might be gained by doing things wrong) was likely to influence how problems were perceived (*Who is at fault? What is the main bottleneck to effective implementation?*). To this end, a simple methodology was developed to identify key “hot spots” or problem areas from the perspective of diverse actors within the NAADS system: farmers, farmer groups, the farmer for a (the group designated under NAADS to represent farmers’ interests), sub-county and district NAADS coordinators, the sub-county leadership, the Ministry of Agriculture (district level) and the NAADS Secretariat. Through semi-structured interviews with each of these actors, individuals were asked to list the issues that have arisen through the implementation of NAADS that concern them, and then to prioritize these issues. Results of interviews with diverse groups were contrasted to generate a list of issues to be addressed by the Coalition. Interestingly, there was significant overlap in responses, indicating that the issues identified are not only systemic (felt throughout the system), but of high priority to enabling a more demand-driven model of service provision. These issues are presented in Table 4.

**Table 4.** ‘Hot Spots’ Identified by Diverse Actors in the NAADS System

<b>Hot Spot</b>	<b>Dimensions of the Problem</b>
Agroenterprise selection / dev’t.	Time is too short to address complex selection criteria (sustainability, equity, profitability, capital); the principle of enterprise specialization is questioned.
Roles & responsibilities	Ambiguity of roles and responsibilities in NAADS implementation manual and absence of clear checks and balances in operations, contributing to abuse of funds and usurpation of decision-making authority.
Funding & financial accountability	Capital for inputs does not accompany service provision; disbursement not synchronous with agricultural cycle; inequitable distribution (flat allocation irrespective of sub-county population, funds insufficient for full coverage); fund allocation is not transparent or participatory at the sub-county level.
Inclusiveness & empowerment	Farmer fora not considered representative; equity is not operationalized for agroenterprise or within program design; farmer capacity to effect change & awareness of legal basis for empowerment is still lacking.
Service delivery	Insufficient quality of service providers; required qualifications (diploma) limit use of local experts; coverage is biased toward more accessible villages & farms; farmers lack control over contracting; monitoring of services is ineffective.

*(ii) Addressing priority bottlenecks*

The core approach to engage communities in analysis and improvement of policy implementation in Kabale District has been a participatory action learning (PAL) process at the sub-county level. Core implementers of this process have been CARE field staff due to their strong field presence and the skill base of their community facilitators. AHI and other member organizations have served a planning and advisory role, developing processes, reflecting on their outcomes and improving upon “facilitation” strategies as the work progresses. AHI, the one research partner, has also played a key role in assisting partners in analyzing and documenting this process. The local-level PAL process was therefore accompanied by both participatory action learning and action research processes within the Coalition itself – the former to work through partnership issues as they emerged, and the latter to impose systematic inquiry onto the change process occurring in the field and within the Coalition.

The objective of PAL has been to work through priority hotspots, focusing on critical bottlenecks that hinder effective implementation of either NAADS policy or of the values underpinning these policies (in cases where the policy itself is somehow deficient). A critical bottleneck was identified at the sub-county level, where funds are disbursed by the Secretariat, contracts made and several key actors (NAADS, local government, farmer representatives) interact. The lack of clear roles, and thus of clear monitoring criteria, had enabled the abuse of roles, authority and funds. Staff from the top-down extension organizations that NAADS is designed to replace were working for NAADS, yet continuing to give directives on how farmers should proceed. Service providers and farmer fora were adhering to such top-down directives, further undermining the program's aims. Lack of transparency in the use of funds had also opened the door to corruption and limited quality assurance in service contracting.

Several important successes emerged from this iterative action-reflection process. Early on, farmers decided they should advocate directly with the Secretariat to raise awareness of the problems they faced and to contest the usurpation of power and decision-making at the sub-county level. They did this by writing a letter to the Secretariat with the Coalition's assistance. Secondly, the lowest-level farmer organization within the NAADS policy was at the Sub-County level, where all the bottlenecks were occurring. Farmers decided they needed lower-level farmers councils at parish level to serve as a mechanism for articulating farmer demand for advisory services and to put checks and balances on the sub-county farmer fora. While the former contributed to the Secretariat's willingness to fund the development of processes for overcoming the power dynamics hindering program success, the latter provided a model for national-level policy reforms to address identified bottlenecks.

### *(iii) Advocacy*

Through a series of informal meetings and presentations, the Coalition shared the results of the problem identification and PAL processes with the NAADS Secretariat. This provided greater detail of the problems encountered in policy implementation, as well as a model for how such problems can be overcome. However, the Secretariat could not make a policy recommendation on the basis of findings from a single sub-county or district. The subsequent step therefore focused on validating the similarity between experiences with NAADS implementation in Kabale with experiences in other districts of Uganda.

### *(iv) National Farmer Institutional Development Study*

NAADS next commissioned CEED to conduct a farmer institutional development study in three other districts of Uganda selected on the basis of variation of key parameters most likely to influence outcomes from policy implementation. Given the nature of the research question (Table 5), an empirical research approach was chosen. The research strategy integrated aspects of the methodology utilized for problem diagnosis in Kabale District, but expanded the study to include a comprehensive review of the literature and NAADS documentation. Findings were remarkably similar across districts, suggesting that the problems identified in Kabale did, in fact, reflect the situation throughout Uganda.

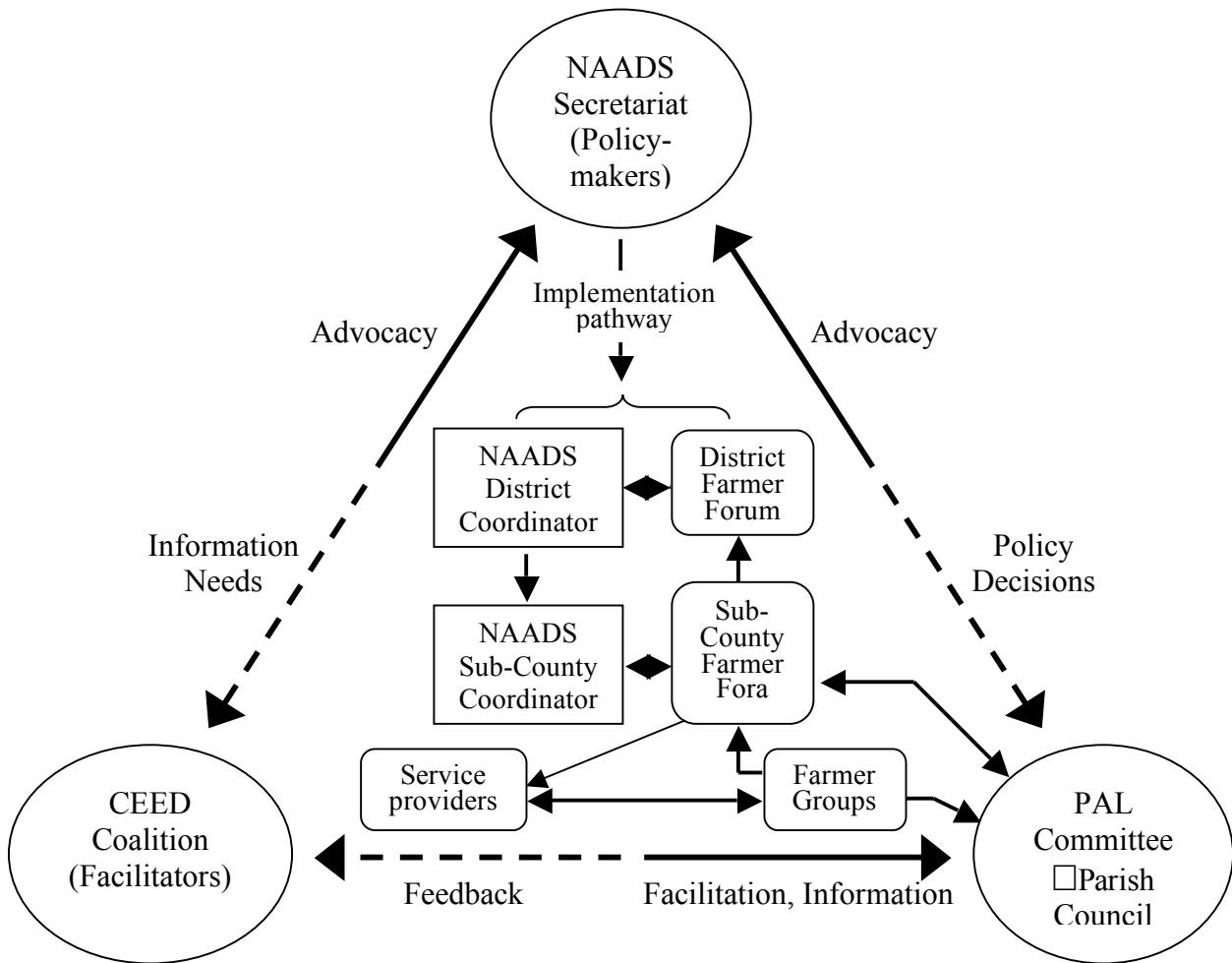
NAADS utilized this farmer institutional development study to back widespread implementation of lessons from the pilot learning process in Kabale District where solutions to identified problems had been overcome. New organizational structures at parish level were institutionalized in districts throughout Uganda where NAADS is working. The assumption underlying this policy decision was that similar problems would require similar solutions. As a research hypothesis, this has yet to be tested. It represents, however, a logical conclusion to the entire policy reform process and is therefore represented in grey font in Table 5. Should the findings prove that an institutional structure alone is insufficient for redressing the power imbalances at the sub-county level, further action research studies may need to be conducted elsewhere in Uganda to derive common lessons on how the necessary conditions for effective parish councils to emerge.

Contrary to the watershed management case study, the research structure in Table 5 was not established ahead of time but built up sequentially as new steps emerged in the R&D continuum. It was therefore re-constructed for the purposes of this article – both to capture the diverse steps in the process, and to suggest how empirical

**Table 5.** Planning Framework for Integrating Diverse Learning Approaches in Ugandan Policy Reforms

Major Activity / Step	Objective	Development Intervention (PAL)	ACTION RESEARCH QUESTIONS	EMPIRICAL RESEARCH QUESTIONS
<b>Problem Diagnosis</b>	To identify major problems associated with policy implementation from the perspective of diverse actors in a policy 'system'.	<i>Primary Research Question:</i> What are the primary problems in the early stage of implementation of the NAADS policy?		1. What are the primary problems in the early stage of implementation of the NAADS policy, as perceived by farmers, NAADS employees at diverse levels, local government and NGOs?
<b>Developing Local Solutions to Problems</b>	To enable local solutions to elite capture of decision-making and benefits from NAADS.	<i>Primary Research Question:</i> How can farmers be enabled to change the processes of elite capture undermining effective implementation of the NAADS policy, and what are the implications for farmer institutional development practices within NAADS? 1. Share research results from Step 1 with farmers at parish and sub-county levels, and reflect on the discrepancies between policy aims and realities. 2. Engage in an iterative PAL process to forge solutions to identified problems.		
<b>Influencing Policy</b>	To enable lessons learned from pilot sites to influence national policy.	<i>Primary Research Question:</i> How well do the problems identified in NAADS implementation in Kabale District reflect the reality in other Districts of Uganda? 1. Share research findings from Steps 1 and 2 with the NAADS Secretariat, and discuss the way forward. 2. Conduct research on farmer institutional development in a representative number of Uganda Districts. 3. Utilize research findings to shape policy.		1. How well do the problems identified in NAADS implementation in Kabale District reflect the reality in other Districts of Uganda?

rigor can be maintained during discrete steps in the process without losing the overall flexibility in responding to opportunities as they emerge. The institutional structure and linkages that enabled these new dimensions of research, advocacy and development interventions to emerge is depicted in Figure 2.



**Figure 2.** An Organizational Model of CEED-Facilitated Linkages between Civil Society and Policy-Makers under NAADS

This case study again illustrates how research-development linkages are fostered through a flexible change process that dynamically incorporates new learning approaches as needed to enable impact at diverse levels. Principles of research quality or rigour are maintained within discrete stages of implementation, yet the process still dynamically embraces new stages of the process and associated learning approaches as needed to advance impact. This case began with a participatory action learning process at early stages of NAADS implementation, proceeded to an empirical research phase to consolidate barriers to effective policy implementation in Kabale District, which then led to a joint PAL / action research phase at local and national levels. The latter led to the commissioning of CEED to conduct empirical research nationally, which enabled the use of lessons from localized PAL processes to reform NAADS policy nationally. To enable the evolving process to come full circle and consolidate lessons from these policy reforms, a new phase of action research is required to observe changes occurring as the outcomes of a bottom-up PAL process in a single sub-county are integrated into more top-down policy directives. From this description, it is clear that these stages could not have been envisioned from the outset. However, by consolidating lessons on how diverse learning approaches jointly contribute to development outcomes, the case provides a roadmap for influencing policy more generally.



## CASE STUDY 3: INSTITUTIONAL REFORMS IN EASTERN AFRICAN AGRICULTURAL RESEARCH INSTITUTES

The final case study summarizes experiences with a process of self-led institutional change in several National Agricultural Research Institutes (NARIs) of eastern Africa. Following a long period of AHI involvement with partner NARS in pilot sites to field-test innovations in approaches used by these organizations, it was felt that the institutions themselves needed to initiate their own internal reform process to support innovative modes of working. For example, institutional incentive structures continued to reward publishing over impact while institutional structures continued to compartmentalize disciplines at the expense of team work. This case study describes the stages in externally-facilitated but self-led processes of institutional change in Ethiopia, Tanzania and Uganda.

The process began with national workshops in which institutional barriers to more widespread use of participatory research principles and approaches were analyzed. While keen to explore the possibilities for improving impact through institutional reforms, the NARS managers rightfully needed evidence that the new working approaches were increasing development impact as well as the key elements to success. This would enable them not only to ensure that the changes were grounded in solid evidence, but to prioritize the elements that should be institutionalized within their own organizations. National studies were then commissioned to look at prominent participatory research programs in Ethiopia and Tanzania to assess their impacts and key elements of successful participatory research programs. Each NARI selected a research team to conduct the research and distill key lessons and impacts.

Research results were written up and shared at national meetings of NARI managers and scientists. These served the basis of strategy development for institutional reforms focusing on new planning and review procedures, reward systems and strategies for improved collaboration within (interdisciplinary team work) and with outside actors (partnerships). From this point forward, the self-led institutional change process has proceeded through an iterative series of steps of planning, testing of innovations at different research centres nationally, and joint reflection on these experiences. At times the tasks given to different centres include action-based learning in the form of PAL; at other times, they include empirical research to consolidate lessons from ongoing projects. The process has also remained responsive to changes in national priorities to embrace emerging themes such as market-oriented and demand-drive agriculture, integrated research and other thematic priorities. Later on as institutional reforms evolve, empirical research will again be needed to objectively assess the impacts of these changes on institutional practice and related development outcomes (Table 6).

This last case study illustrates the contributions of participatory action learning and action research at an institutional level, and the role of empirical research in grounding institutional change agendas. While the content of learning and the level at which learning takes place differs across each case study, the flexible process of integrating new learning approaches into a change process as needed to answer new questions is similar.

### Discussion

The case studies illustrate the power of merging diverse learning approaches into a fluid R&D continuum in which the relative strength of different approaches is pulled upon – either through prior planning of these linkages (as in watershed management and institutional reform examples), or through more opportunistic leveraging of the strengths of each as new needs emerge (as illustrated in the case of Ugandan policy reforms). A cross-case comparison also illustrates that while the sequencing of learning approaches may vary, there is a strong tendency toward three discrete phases of research and action:

- 1) Empirical research for problem diagnosis, so as to ground subsequent action learning and research in a firm understanding of problems and opportunities characterizing the system;
- 2) Participatory action learning to address the problems through an iterative sequence of actions, reflections and re-planning processes, with action research superimposed so as to synthesize higher-level lessons and findings of potential application in addressing similar problems elsewhere; and

**Table 6.** Planning Framework for Integrating Diverse Learning Approaches in Institutional Change

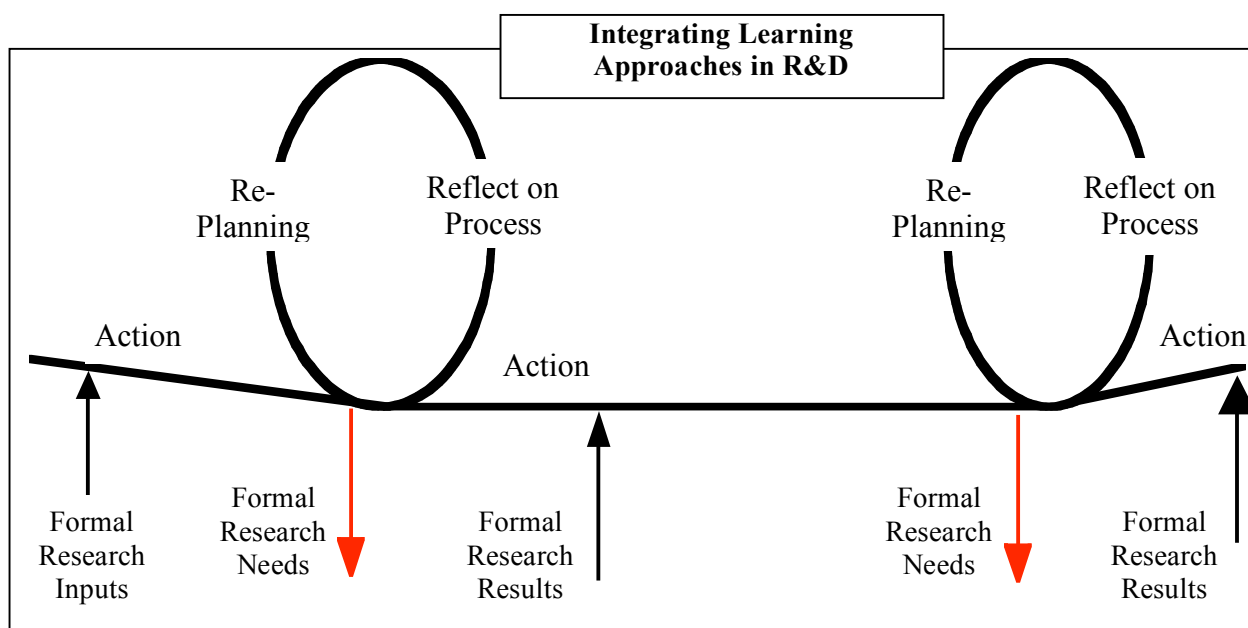
<b>Major Activity / Step</b>	<b>Objective</b>	<b>Development Intervention (PAL)</b>	<b>ACTION RESEARCH QUESTIONS</b>	<b>EMPIRICAL RESEARCH QUESTIONS</b>
<b>In-Depth Exploration of Prominent Participatory Research Programs</b>	To identify the ‘added value’ of participatory research and harvest ‘best practices’ to inform institutional reforms.	<i>Primary Research Question:</i> What are the features and impacts that distinguish participatory from conventional research paradigms in agriculture, and what specific practices have led to notable cases of success?		1. What are the features and impacts that distinguish participatory from conventional research paradigms in agriculture, and what specific practices have led to notable cases of success?
<b>Iterative Learning for Institutional Reform</b>	To enable select NARIs to institutionalize lessons and ‘best practices’ of observed cases.	<i>Primary Research Question:</i> What are the primary barriers to effective institutional reforms, and how can these be overcome? Iterative series of steps consisting of: 1. Institutional reflection and planning; and 2. Implementation and data collection.	1. What are the primary barriers to effective institutional reforms, and how can these be overcome?	1. What is the impact of institutional reforms?

3) Empirical research to assess the impact of PAL processes with respect to the ultimate R&D goal, and determine whether additional steps are needed.

Additional steps may be added as needed to ‘build out’ each step or to connect sequential steps (as in the case of advocacy work in the policy reform case), and the entire process may need to be repeated if additional knowledge gaps need addressing to reach the ultimate objective.

A simplified diagram illustrating how all learning approaches are embedded in an iterative series of participatory action learning loops is presented in Figure 3. We enter the loop once we engage the protagonists (community, organization) in planning, action and reflection. Each of these learning events should provide important inputs to the next learning event (altering the course of action), which is itself an indication that reflection is leading to real change. More formal, extractive forms of research (illustrated by vertical arrows) come in at the beginning of the process to inform the approach through a clear identification of the problem, and may be inserted into the PAL process to fill critical information gaps as they emerge. Empirical research contributions must adhere to the overall development objectives, but new questions often emerge from the beneficiaries or the facilitators as new uncertainties undermining the targeting of development interventions emerge. While action research is embedded in the PAL process (central loops) and may not exist in isolation from it, its role in generating general lessons for development practice mean it is also represented by downward arrows. In cases where action research findings are of direct relevance to the change process from which they emerge, these contributions are represented by upward arrows representing information packaged by research for direct beneficiaries.

While the above cases illustrate how the integration of diverse learning approaches can be attained, significant challenges remain to making such an approach part of standard R&D practice. First, all actors must reach a common vision about the ultimate end to which each learning approach is put, the crucial role played by each, and the learning approach through which research objectives are defined (namely, the PAL process at diverse levels). The scientific community continues to value empirical over action research, despite the fact that theory and practice have much to gain from one other. This will hinder attempts to reach common objectives, or to ground research questions in development process, unless universities embrace a more pluralistic approach to teaching science. Each of the above learning approaches rests on different epistemological grounds, which in turn influences the standards of methodological “rigor” within each. Formal training must make explicit the respective strengths of diverse research traditions in addressing real-world problems, which in the course of a generation would help shape the R&D institutions in which these skills are applied.



**Figure 3.** Embedding Empirical and Action Research in Participatory Action Learning Processes

A second challenge lies in the mutual under-appreciation among researchers and practitioners with respect to the critical importance of each other's methods and skill base to development (Bebbington and Farrington, 1992; Turton and Farrington, 1998). This under-appreciation stems from the inadequacy of institutions and frameworks for linking diverse learning approaches in practice. While the framework proposed in this paper represents an opportunity in this regard, it is only through widespread testing of new forms of partnering and knowledge sharing that this divide will be overcome in practice.

A final challenge relates to the second, and lies in the development of effective institutional arrangements to link the diverse learning approaches and their required skill base. Currently, the most empowering action learning processes are found within development organizations, classrooms and other domains of "practice", skills for empirical research in diverse disciplines are concentrated in research organizations, and quality action research has yet to be institutionalized in most parts of the world. Clearly, a new skill base would need to be integrated into existing institutions and new institutional linkages forged between research and development organizations in order to institutionalize such an approach. An immediate solution to this problem is to lobby for increased funding of institutional innovations to test different institutional affiliations and linkages mechanisms in practice, and systematically research and document the respective strengths and weaknesses of each. An action research-action learning approach can be productively utilized to test new strategies for inter-disciplinary and inter-institutional cooperation. Research questions could be designed to fill critical information gaps around such partnerships, namely, "Which institutional arrangements and approaches are most effective for capitalizing upon the respective strengths of diverse learning approaches to enhance development impact?", and "What is required in the form of training, incentive systems, field experience and other investments to operationalize these arrangements?"

## Conclusions

In contrast with the general tendency to place a higher value on either research or development, empirical or action research, this paper highlights the critical role played by each in achieving development impact. While participatory action and social learning approaches can generate the most successful results with respect to fully empowering development processes, empirical research has the upper hand in filling critical information gaps that defy localized knowledge capture or more empowering forms of research. Empirical research can guide action by characterizing situations, thereby setting the context and rationale for development-oriented interventions. It is also the most powerful tool for assessing impact from such interventions, and for providing a firm grounding for higher-level decision-making at institutional or policy levels. Action research, on the other hand, has a fundamental role to play in synthesizing action-related findings ("*What works, where and why?*") for a broader audience and in understanding how empirical research results can best inform development practice, and therefore in scaling out the impacts of location-specific development interventions. A number of didactic tools are presented to justify the importance of diverse and articulation of diverse learning approaches, and to enable their application by the international development community. Yet questions remain on the institutional arrangements would enable widespread application of such an approach. The paper is written in an attempt to encourage other R&D actors to reflect upon the relevance of the model within their own practice, and to contribute to a broader debate on how to best put it into practice.

## Acknowledgements

The authors would like to acknowledge the support of AHI site teams (the Ethiopian Agricultural Research Organization, Selian Agricultural Research Institute, Mlingano Soils Research Institute and Kenyan Agricultural Research Institute), members of the regional research team of AHI and colleagues at the World Agroforestry Centre (ICRAF) and Centro Internacional de Agricultura Tropical (CIAT) for stimulating dialogue which gave rise to a number of the ideas in this paper. We would also like to acknowledge the generous financial support from our donors (the Rockefeller Foundation, SDC, the Netherlands and Norwegian governments, IDRC and DFID).

## References

- Agbamu, J. (2000) Agricultural Research–Extension Linkage Systems: An International Perspective. *AgREN Network Paper, 106a*, 1-7.
- Argyris, C., Putnam, R., & MacLain-Smith, D. (1982) *Action Science: Concepts, Methods and Skills for Research and Intervention*. San Francisco: Jossey-Bass.
- Baker, D., & Benjamin, L. (2000) The Affirmation of the Scientist-Practitioner: A Look Back at Boulder. *American Psychologist, 55*(2), 241-247.
- Barnsley, J., & Ellis, D. (1992) *Research for Change: Participatory Action Research for Community Groups*. Vancouver: Women’s Research Centre.
- Basu, S. (1996) Need for Action Research for Health Development among Tribal Communities of India. *South Asian Anthropologist, 17*(2), 73-80.
- Bebbington, A., & Farrington, J. (1992) The Scope for NGO-Government Interactions in Agricultural Technology Development. *AgREN Network Paper, 33*, 1-22.
- Checkland, P. (1991) From Framework through Experience to Learning: The Essential Nature of Action Research. In H.E. Nissen, H.K. Klein, & R. Hirschheim (Eds.), *Information Systems Research: Contemporary Approaches and Emergent Traditions* (pp. 397-403). North-Holland: Elsevier Science Publishers.
- Checkland, P., & Holwell, S. (1998) Action Research: Its Nature and Validity. *Systemic Practice and Action Research 11*(1), 9-21.
- Coghlan, D., P. Coughlan, & Brennan, L. (2004) Organization for Research and Action: Implementing Action Researcher Networks. *Systemic Practice and Action Research, 17*(1), 37-49.
- Dick, B. (2002) Action research: Action and Research. Paper presented at the seminar *Doing Good Action Research*, Southern Cross University, Monday February 18.
- Elliott, J. (1991) *Action Research for Educational Change*. Buckingham: Open University Press.
- Fals-Borda, O. (1988) *Knowledge and People’s Power: Lessons with Peasants in Nicaragua, Mexico and Colombia*. New Delhi: Indian Social Institute.
- Gardner, J.S. (2003) Evaluation of Capacity and Policy Development for Environmental Sustainability: A Case from Himachal Pradesh, India. *Canadian Journal of Development Studies, XXIV*(1), 137-153.
- German, L.A., Kidane, B., & Shemdoe, R. (in press) Social and Environmental Trade-Offs in Agroforestry: A Methodology for Identifying Niche Incompatibilities in Agroforestry. *Environment, Development and Sustainability*.
- Hagmann, J. (1999) *Learning Together for Change: Facilitating Innovation in Natural Resource Management through Learning Process Approaches in Rural Livelihoods in Zimbabwe*. Weikersheim: Margraf Verlag.
- Hagmann, J., & Chuma, E. (2000) Tying Up Loose Ends: Integrating Soft and Hard Methodologies in NRM Research and Extension. In I. Guijt, J. Berdegúe, & M. Loevinsohn (Eds.), *Deepening the Basis of Rural Resource Management* (pp. 109-121). The Hague: ISNAR.
- Hagmann, J., & Chuma, E. (2002) Enhancing the Adaptive Capacity of the Resource Users in Natural Resource Management. *Agricultural Systems, 73*, 23-39.
- Hammersley, M. (2004) Action Research: A Contradiction in Terms? *Oxford Review of Education, 30*(2), 165-181.
- Kelly, J.G., Azelton, L.S., Lardon, C., Mock, L.O., Tandon, S.D., & Thomas, M. (2004) On Community Leadership: Stories about Collaboration in Action Research. *American Journal of Community Psychology, 33*(3/4), 205-216.
- Lewin, K. (1946) Action Research and Minority Problems. *Journal of Social Issues, 2*, 34-46.
- Maarleveld, M., & Dangbégnon, C. (1999). Managing Natural Resources: A Social Learning Perspective. *Agriculture and Human Values, 16*, 267-280.
- May, M.L., Bowman, G.J., Ramos, K.S., Rincones, L., Rebollar, M.G., Rosa, M.L., Saldana, J., Sanchez, A.P., Serna, T., Viega, N., Villegas, G.S., Zamorano, M.G., & Ramos, I.N. (2003) Embracing the Local: Enriching Scientific Research, Education and Outreach on the Texas-Mexico Border through a Participatory Action Research Partnership. *Environmental Health Perspectives, 111*(13), 1571-1576.
- McClintock, D., Ison, R., & Armson, R. (2003) Metaphors for Reflecting on Research Practice: Researching with People. *Journal of Environmental Planning and Management, 46*(5), 715-731.
- McTaggart, R. (1992) Reductionism and Action Research: Technology versus Convivial Forms of Life. *Proceedings of 2<sup>nd</sup> World Congress on Action Learning*, University of Queensland, 14-17 July, 1992.

- Meinzen-Dick, R., Adato, M., Haddad, L., & Hazell, P. (2003) Impacts of Agricultural Research on Poverty: Findings of an Integrated Economic and Social Analysis. *IFPRI Discussion Paper, 111*, 1-87.
- Percy, R. (1999) The Experiential Learning Cycle and its Application towards the Transformation of Governmental Extension Services in Sub-Saharan Africa. *International Journal of Lifelong Education, 18(5)*, 370-384.
- Pretty, J., & Buck, L.E. (2002) Social Capital and Social Learning in the Process of Natural Resource Management. In C.B. Barrett, F. Place, & A.A. Aboud (Eds.), *Natural Resources Management in African Agriculture*. Nairobi: ICRAF and CABI Publishing.
- Reason, P., & Bradbury, H. (2001) *Handbook of Action Research*. London: Sage.
- Röling, N., & Wagemakers, A. (1998) *Facilitating Sustainable Agriculture: Participatory Learning and Adaptive Management in Times of Environmental Uncertainty*. Cambridge: Cambridge University Press.
- Sanginga, P. (2004) Facilitating Participatory Processes for Policy Change in Natural Resource Management: Lessons from the Highlands of Southwestern Uganda. Proceedings of the conference *Integrated Natural Resource Management in Practice*, ICRAF Headquarters, Nairobi, 12-15 October, 2004.
- Stenhouse, L. (1975) *An Introduction to Curriculum Research and Development*. London: Heinemann.
- Trout, J., Dokecki, P.R., Newbrough, J.R., & O’Gorman, R.T. (2003) Action Research on Leadership for Community Development in W. Africa and N. America: A Joining of Liberation Theology and Community Psychology. *Journal of Community Psychology, 31(2)*, 129-148.
- Turton, C., & Farrington, J. (1998) Enhancing Rural Livelihoods through Participatory Watershed Development in India. *ODI Natural Resource Perspectives, 34*, 1-4.
- Wadsworth, Y. (1991) *Everyday Evaluation on the Run*. Melbourne: The Action Research Issues Association Inc.

## **The AHI Working Papers Series**

The AHI Working Papers Series was developed as a medium for AHI staff and partners to synthesize key research findings and lessons from innovations conducted in its benchmark site locations and institutional change work in the region. Contributions to the series include survey reports; case studies from sites; synthetic reviews of key topics and experiences; and drafts of academic papers written for international conferences and/or eventual publication in peer reviewed journals. In some cases, Working Papers have been re-produced from already published material in an effort to consolidate the work done by AHI and its partners over the years. The targets of these papers include research organizations at national and international level; development and extension organizations and practitioners with an interest in conceptual synthesis of “good practice”; and policy-makers interested in more widespread application of lessons and successes.

## **Acknowledgements**

The African Highlands Initiative (AHI) expresses its gratitude to the Department for Research and Development of Tanzania (DRD); Ethiopian Institute of Agricultural Research (EIAR); FOFIFA of Madagascar; Kenyan Agricultural Research Institute (KARI); National Agricultural Research Organization of Uganda (NARO); International Centre for Tropical Agriculture (CIAT); World Agroforestry Centre (ICRAF); Tropical Soils Biology and Fertility Institute of CIAT (TSBF-CIAT); International Maize and Wheat Centre (CIMMYT); International Potato Centre (CIP); International Institute of Tropical Agriculture (IITA); Ministries of Agriculture and NGO partners operating in AHI Benchmark Sites of Ethiopia, Kenya, Tanzania and Uganda for the technical, facilitation and partnership roles they have played in our effort to develop tools and methods in Integrated Natural Resource Management together with local communities.

AHI is very thankful to the donors which tirelessly financed the regional and global engagement of AHI in improving our development and natural resource management research endeavours, namely the Swiss Development Cooperation (SDC); International Development Research Council (IDRC); Ministerie van Buitenlandse Zaken (the Netherlands government); Cooperazione Italiana (Italian government); the Rockefeller Foundation; the European Commission; the Consultative Group on International Agricultural Research (CGIAR); the Department for International Development (DfID); the Collective Action and Property Rights Programme of the CGIAR (CAPRi); the International Potato Center (CIP) and ECAPAPA.