

## **Doing things differently: Post-Harvest Innovation Learning Alliances in Tanzania and Zimbabwe**

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## **Doing things differently: Post-Harvest Innovation Learning Alliances in Tanzania and Zimbabwe**

### **Abstract**

Conventional approaches to technology transfer within small-scale farming systems have frequently failed. Hitherto, post-harvest service provision and research have focused on technology development, with less attention being given to understanding delivery system constraints, distinguishing between the needs and priorities of different households, or exploring farmers' own research capabilities. Consequently, household food security remains precarious for many people in the rural areas and food production levels show little or no increase. Recent approaches to scaling-up technologies – products and processes – point to its dependence on the activities and interactions of a diversity of key players and organizations, and place emphasis on doing things differently to overcome institutional constraints. Translating ideas into social and economic use requires appropriate technologies (hardware innovation), compatible mindsets (software innovation), and favorable institutional settings (system-ware innovation).

In Tanzania and Zimbabwe, key post-harvest stakeholders from all sectors - public, private, voluntary - were invited to become members of Post-Harvest Innovation Learning Alliances (PHILAs). The overall goal of the alliances was to effect better mobilization of the respective national agricultural systems to sustain the uptake and adoption of post-harvest knowledge for the benefit of poor farmers, but the immediate objective was that of exploring better ways of working and learning together.

Core activities of the two in-country alliances were: collaborative research initiatives; internal information-sharing and; engagement with other influential players in the post-harvest system. Case studies were commissioned in the two countries to critically examine current service-provision practices, farmer-demand mechanisms, the bearing of current post-harvest policies, their formulation and implementation dynamics.

The paper reports on practical insights and improved recommendations for current working practices and utilization of post-harvest information as well as policy and implementation strategies. Key lessons learnt relate to: the system-ware approach; inter-organizational working; policy implications; commercial interests; vulnerability and adaptive capacity; and learning about learning.

**Keywords:** learning alliances; post-harvest; food security; farmer diversity; innovation systems; system-ware; institutional learning and change; multi-stakeholder processes.

## **Doing things differently: Post-Harvest Innovation Learning Alliances in Tanzania and Zimbabwe**

### **INTRODUCTION**

Conventional approaches to technology transfer within small-scale farming systems have frequently failed. Household food security remains precarious for many smallholder farmers and food production levels show little or no increase. Hitherto post-harvest service provision and research have focused on technology development, with less attention being given to understanding delivery system constraints, distinguishing between the needs and priorities of different households, or exploring farmers' own research capabilities. Recent approaches to scaling-up technologies – products and processes – point to its dependence on the activities and interactions of a diversity of key players and organizations as mediated by existing institutional arrangements and policies – all together referred to as the innovation system (Fig. 1) (Arnold and Bell 2001; Hall, Mytelka, and Oyeyinka 2003; Hall et al. 2004; Lundby, Gottrett, and Ashby 2004). Institutional arrangements, or institutions, are referred to here in the sense of 'the mechanisms, rules and customs by which people and organizations interact with each other' as first suggested by North (1990). The key challenge to effecting impact is perceived less in terms of devising new technologies – *doing different things* – and more in terms of improving the working of the innovation system – *doing things differently* – to overcome institutional constraints. Translating ideas into social and economic use requires appropriate technologies (hardware innovation), compatible mindsets (software innovation), and favorable institutional settings (system-ware innovation).

*[please insert Figure 1 about here]*

The idea that extension services need to be demand-led, client oriented, farmer empowering etc., has been widely promulgated and gained widespread acceptance in many circles (Leeuwis 2004; Ministry of Agriculture and Food Security 2003; Ministry of Food and Agriculture 2003; Pazvakavambwa and Hakutangwi 2006). However, arriving at this point has involved many adherents in negotiating a tortuous learning path, and one which has not yet ended – the way to achieving the ideal is still very much under construction, if not contested.

### **UNDERLYING PROBLEMS AND THE SEARCH FOR SOLUTIONS**

The common denominator for the core research team was originally the problem of storage insect pests, and it was only after much work – and much frustration – in this field, that it was realized that there was need to examine and address the surrounding institutional context, if the research was to have widespread impact. The food security and income opportunities of many rural households in sub Saharan Africa (SSA) are seriously undermined by storage insect pests. Presently many small-scale farmers rely on imported organo-phosphate based pesticides to protect stored grain, but farmers and various authorities are increasingly questioning the safety and efficacy of synthetic pesticides (Arthur 2002; Giga and Katerere 1986; Marange et al. 1997; Pesticides Action Network (PAN) and Technical Centre for Agricultural and Rural Co-operation (CTA) 1995). Other households, who use traditional materials such as ashes, botanicals and sand to control storage insect pests, are faced with inconsistent and often poor results (Mvumi et al. in preparation; Stathers et al. 2002a; Stathers et al. submitted; Tran and Golob 1999).

To counter this widespread problem, a set of research projects was commissioned by the Crop Post-Harvest Program (CPHP) of the UK Department for International Development (DFID) through the mid-late 1990s to 2005, to explore the efficacy of the inert dusts known as diatomaceous earths (DEs) (see Box 1).

These projects established that DEs were efficacious as grain protectants in a range of agro-ecological zones in Zimbabwe and Tanzania. It was also established that the technology – both product and process – was readily usable by diverse smallholders in the multiple research locations; and that food stocks (maize, sorghum, beans and cowpeas) were successfully protected for periods of more than 8 months (Stathers, Mvumi, and Golob 2002b; Stathers et al. submitted). The research trialled both imported commercial DEs (Protect-It<sup>®</sup> and Dryacide<sup>®</sup>) and a few of the many local DEs, whose deposits are located throughout SSA, and had been found effective in laboratory experiments (Mvumi et al. 2006). Although local DEs will probably represent more economically sound (i.e. to the state) and financially viable (i.e. to business and to farmers) options in the longer run, further work is first required to establish and implement safety, extraction and processing protocols. The projects also developed an extension tool which provides ways for extension staff to identify and map the production and post-harvest needs and priorities of diverse rural communities, to better target those farmers and households for whom the DE and other technologies are best suited.

#### **Box 1. What are Diatomaceous earths?**

Diatomaceous earths (DEs) are soft whitish powders formed from the fossils of tiny planktons which lived in oceans, rivers and lakes (Quarles 1992). After processing – mining, grinding and drying – these powders can be admixed with grain to kill insect pests. When DEs come into contact with insects, they absorb the wax from the cuticle of the insect which then loses water, dehydrates and dies (Ebeling 1971). DEs have extremely low toxicity to mammals (Subramanyam et al. 1994) and are therefore very safe to mix with food. Due to their high porosity, in industry DEs are used as filters to help clarify fruit juices, beers, wine, pharmaceuticals, and as fillers in paints, plastics, coating agents in fertilizers, carrier for pesticides amongst many other things. They are also used as feed mix to combat internal parasites in domestic animals (Allen 1972). DEs are currently registered for use as grain protectants in Australia, Brazil, Canada, Croatia, China, Germany, Indonesia, Japan, Philippines, Saudi Arabia, United Arab Emirates, UK and the USA. In addition to commercial DEs, there is potential to exploit local or regional DEs in SSA.

#### **TOWARDS GETTING DIATOMACEOUS EARTHS INTO USE**

Establishing the efficacy, safety and usability of DEs as stored grain protectants over a number of seasons, in various agro-ecological zones in two countries, and by numbers of diverse households, was not to be the end of the learning path, but rather the start of a new and different journey. Getting DEs (or any technology however apparently appropriate) into social and economic use amongst rural households who are currently treating their foodstocks with potentially dangerous pesticides, requires a multitude of changes in the institutional setting. Farmers and extension staff have to fully understand the limitations and dangers of existing protectants, advisors have to be informed and influenced and to recommend policy and regulation changes, registration authorities need to be persuaded to ‘buy into’ and support research findings, members of the business community are needed to step forward and champion the registration process – all of which involves many more stakeholders than originally conceived as active participants in the first research initiatives.

In addition then to examining the hardware (i.e. the DE technology) and software (i.e. the skills and knowledge required to use the technology) issues, the researchers were challenged with exploring and addressing the innovation setting of the respective country post-harvest systems ('system-ware'), and in particular the constraints both within and between different organizational stakeholders at all levels. To take on this much wider study, a further one year proposal was successfully submitted to the CPHP for funds to explore new ideas as to how the national innovation systems in Tanzania and Zimbabwe can be better mobilized to sustain the uptake and adoption of crop post-harvest knowledge for the benefit of poor farmers. The research propositions were:

1. That undertaking (action) research within an alliance of practitioners, researchers, policy makers and activists will lead to greater impact and facilitate scaling-up through, amongst other things, development of broader ownership of concepts and process, enhancement of local capacity (particularly for adaptive management), and the emergence of locally appropriate solutions or innovations”.
2. That current practice in statutory post-harvest service provision and supporting initiatives are failing to distinguish between the needs and priorities of different households and therefore failing to meet their diverse demands.
3. That researchable constraints and opportunities exist at the current interface of supply and utilization and the planned insights into these could help facilitate improvement in terms of ‘shaping’ and delivery of post-harvest information by the range of PH knowledge management organizations.

## **THE RESEARCH APPROACH**

Learning Alliances (LAs) (see Box 2) were to be both the means of testing proposition 1 and the vehicle within which research activities would be implemented to examine propositions 2 and 3.

Proposition 1: Operationalization of the project involved inviting, key post-harvest stakeholders in Tanzania and Zimbabwe to join and initiate Post-Harvest Innovation Learning Alliances (PHILAs) to promote improved partnerships and to develop new ways of getting relevant technologies such as DEs into economic and social use. The LAs would explore new and better ways of working between key post-harvest stakeholders, with the aim of expediting the scaling-out and scaling-up of post-harvest innovations appropriate to the needs, priorities and circumstances of diverse farmers. The idea was that they would not only improve the sharing and adoption of existing ideas, but also create a framework within which institutional constraints could be identified and creatively addressed, adaptive management be encouraged, and local ownership of emerging solutions thrive.

### **Box 2. Characteristics of Learning Alliances**

#### **Learning alliances:**

- Are groups of individuals or organizations with a mutual interest in solving an underlying problem and scaling-up solutions.
- Bring together a wide range of partners with capabilities in implementation, regulation, policy and legislation, research and learning, documentation and dissemination etc.
- Represent part of the bigger whole, and thus capture some of the organizational complexity that constitutes the day-to-day realities of the innovation system.
- Comprise partners who are typically clustered at different ‘administrative’ (e.g. national, regional, district) levels – *stakeholder platforms* – within the innovation system.
- Aim to identify and breakdown the barriers that constrain learning – both across platforms (i.e. *horizontally*) and between platforms (i.e. *vertically*).

- Promote flexible and adaptive working practices, share responsibilities, costs and benefits.

Based on Moriarty et al. (2005)

Propositions 2 and 3: Propositions 2 and 3 were to be examined through a series of collaborative research initiatives, subsequently referred to as case studies (CSs), to be undertaken by members of the alliance, and where possible exploring new working partnerships. These CSs were to be designed to explore current post-harvest service provision (proposition 2) and the opportunities and constraints at the interface of supply and demand (proposition 3).

To stimulate new ways of working from the start, the research management team (MT) sought to build action reflection cycles into all processes. Development of the CS terms of reference (TOR) by the MT, and of the corresponding proposals by the implementation teams, thus deliberately involved a number of iterations. The design of the implementation activities typically involved triangulation between sources, and it was intended that the research teams would provide regular feedback to the MT, both to optimize the studies and to provide opportunities for mutual learning about the process. Planned iterations also included submission of draft documents on the case studies to the MT for review and circulation to other PHILA members for their input, and presentation of the upgraded case studies by the implementation teams to a review workshop.

As project thinking evolved, propositions 2 and 3 were re-interpreted along the lines of supply- and demand-side issues, with project output objectives coming more to reflect these two sides. The supply-side output objective (i.e. relating to current service provision and supporting research initiatives) was to develop practical ‘insights’ from current working practices, and to generate ‘improved practice’ recommendations. Supply-side CSs included:

- CS1: Interface analysis of public service provision and public sector research;
- CS2: Interface and comparative analyses: public service providers and farmers; farmer-centered organizations and farmers;
- CS3: District ‘nodal’ studies - multi-stakeholder workshop to establish what is and is not working well.

The demand-side output objective, which focused on farmers in the general context, and picking up on constraints from the previous DE work, on commercial enterprises in the narrower context of manufacturing and distributing PH protectants, was to explore and improve the ability of: (i.) farmers, and (ii.) commercial enterprises, to access and utilize relevant PH information. Planned CS activities to explore and improve demand included:

- CS4: Empowerment / ‘people-focused’ studies: Study of small number of agencies / projects who utilize an ‘empowerment’ approach.
- CS5: Household ‘enquiry visits’: learn to listen, and listening to learn from farmers.
- CS6: Farmer and frontline extension staff exchange visits.
- CS7: Interface analysis of commercial enterprises and service providers.

The overall output objective, which was to be built on the findings from the examination of the three propositions and be applicable at the national level, was to generate and promote recommendations for policy and implementation strategies that will improve the performance of PH service providers and researchers and enhance related decision-making by farmers and commercial enterprises. CS activities to generate policy and implementation strategy recommendations included:

- CS8: Literature review on PH policy experience, advice and formulation;

- CS9: The agro-processing industry: opportunities and constraints for small-scale farmers?
- Synthesis paper based on literature review, and findings from Output objectives 1, 2 and 3;
- Promotional meeting with national innovation systems players.

The relationship of the project with different end-user groups would be determined by the LA approach in general – LAs are a microcosm of the whole system – and PHILA’s activities in particular, and by the focus of the research activities which were to be predominantly at the district level. It was felt that the study of the interplay of service provision and farmer-demand, issues of effectiveness and sustainability, the processes of decentralization etc. would prove most insightful given the limited resources and timeframe, if focused at the district level. By the time that funds were available to managing partners in the South, less than 10 months remained to complete a complex action-research oriented project founded on and trialling multi-stakeholder processes.

Two districts, exhibiting contrasting characteristics, were accordingly identified and selected in both countries. In Tanzania this choice was bounded by the decision to work somewhere in the central semi-arid regions of Dodoma and Singida, where complementary initiatives already existed; and Manyoni and Singida districts were selected by participants – PHILA novitiates – at the inception workshop. In Zimbabwe the choice was restricted for ease of operation and logistical reasons to the two districts in which the parent projects had already been working, Buhera and Binga districts. The parent projects were: “Grain storage pest management using inert dusts” (R7034; CPHP-funded) and “Small-scale farmer utilisation of diatomaceous earths during storage” (R8179; CPHP-funded).

The means of engagement with end-users was to be through PHILA’s collaborative research, its internal information-sharing, or strategic engagement activities. By commissioning diverse members to implement collaborative research, or through their more general collaboration or participation in these studies, PHILA would seek to raise awareness and extend the individual and organizational capacity of its members. The CSs would also involve other potential end-users who while not PHILA members, would benefit from their involvement (e.g. CS 6: farmers involved in the exchange visits; CS3: district councilors and administrators participated in the district workshops) (see Morris et al. 2006).

## **PROJECT ACHIEVEMENTS**

### ***Post-Harvest Innovation Learning Alliances (PHILAs)***

The aim of PHILA was to advance understanding of and the effectiveness of LAs as agents of change (i.e. effect institutional learning and change). The main activities were information-sharing, action research (i.e. the CSs), engaging with and influencing key external stakeholders (i.e. non-members), plus alliance management activities.

In terms of developing new ways of working, the PHILA approach, with its underpinning *innovation system* perspective and inclusive principles, provided a safe space for diverse individual stakeholders from multiple organizations to work and learn together in strategic pursuit of a common purpose. Achievements include:

- Post-harvest LAs (PHILA) were established in Tanzania and Zimbabwe; membership currently totals more than 40 organizations from the public, voluntary and private sectors.
- PHILA’s approach and activities – collaborative action-research, information-sharing and engagement – have raised awareness and understanding on matters of institutional learning and change among members and other post-harvest system stakeholders.

- New working patterns and approaches trialled by PHILA were documented, and are generating fresh understanding and suggesting new modes of working to effect systems-level change. Many members have adopted tools and techniques introduced to them through PHILA.
- PHILA's performance against its core activities (i.e. collaborative research, information-sharing (internally), engagement (externally), and management) was assessed by the membership in both Tanzania and Zimbabwe, and lessons noted (see Morris et al. 2005a; Mvumi et al. 2005).
- Lessons learnt have been documented and shared at two innovation symposia; one in Delft, Netherlands (June 2005) and another more recently in Kampala, Uganda (November 2006).
- The *modus operandi* of the PHILA MT advocates and has promoted (i.e. provided resources and training for) the use of modern information-communication technologies (ICTs).
- Members' assessment of PHILA's performance roundly endorsed the use of and emphasis placed on ICTs, e-mails and text messages in particular, while acknowledging the disadvantage that those lacking access suffered.
- PHILA website established (with a members only working area):  
<http://www.nri.org/PHILA/>

PHILA continues to function in both countries, and studies of the effectiveness of these alliances, and particularly the level of member participation in network activities, are currently taking place. As in the earlier case study work, alliance members have been commissioned to undertake these studies.

***Development of practical 'insights' from current working practices and generation of 'improved practice' recommendations***

- Body of critical information on the interface between public service providers and public sector research in Tanzania was generated, shared and reviewed.
- Body of critical information comparing and contrasting how public service providers and farmer-centered organizations work with farmers in two dissimilar districts of Tanzania and one district in Zimbabwe was generated, shared and reviewed.
- Past, present and potential post-harvest service provision were explored, appraised and documented in pairs of contrasting districts in both Tanzania and Zimbabwe; participatory agricultural development planning exercises were initiated; associated multi-stakeholder processes, tools and techniques were developed and shared with the respective district personnel and PHILA members.
- Practical ideas for increasing responsiveness to farmer-demand were developed and documented.
- Case study on farmer and extension staff learning through exchange visits was undertaken and learning materials generated, including a film based on participants 'video diary' entries; general briefing note under preparation.
- Awareness raising and training amongst extension staff from two districts in Tanzania and one in Zimbabwe on the enquiry visit approach (a portfolio of techniques and tools for mainlining farmers, facilitating understanding of their diverse circumstances and responsiveness to their decision-making) were undertaken.
- Case studies on the bearing of diverse policies, their formulation and implementation, on the post-harvest situations in Tanzania and Zimbabwe, were undertaken, shared and reviewed.

***Exploration and improvements in the ability of different stakeholders to access and utilize relevant PH information***

*(i.) farmers:*

- More than 260 farmers in Kongwa and Babati districts in Tanzania, and in Buhera and Binga districts in Zimbabwe, learnt about and independently assessed a range of grain protection treatments including DEs.
- At least 70 farmers in Tanzania and Zimbabwe who had previously been involved over the last 2-3 years in the running of researcher- and farmer-managed grain storage trials, continued their own experimentation with DEs.
- In Tanzania, farmers and extension staff from Singida and Manyoni districts visited farmers in Kongwa district who had been running grain protection trials for three years. Some of the visitors had themselves been conducting grain protection trials with botanicals following the sanitization of their storage facilities with Actellic EC; next season (2006/07) they too will be testing DEs. Materials on farmer and extension staff learning through exchange visits has been generated
- Farmers and extension staff in Zimbabwe, who were invited to the PHILA inception and review workshops, testified to the efficacy of DEs. They are also demanding that the products be made available to the farming community through the normal market channels.
- Guidelines (in the form of a briefing note), including innovative techniques and analytical tools, for effecting exchange visits, and developing understanding of, transferring and consolidating lessons from, farmer-to-farmer learning, are being developed.
- Sets of case studies on empowerment initiatives in Tanzania and Zimbabwe respectively have been undertaken and potentially transferable lessons identified.

*(ii.) commercial enterprises*

- A case study on the interface between agro-chemical companies and public service provision and research in Tanzania has been undertaken and documented; the work has been reviewed by PHILA members and is presently being up-graded.

***Generation and promotion of recommendations for policy and implementation strategies that will improve the performance of PH service providers and researchers and enhance related decision-making by farmers and commercial enterprises***

- Detailed presentations of the parent project's (R8179) findings on the use of DEs as grain protectants were made to participants at the PHILA inception workshops in Zimbabwe and Tanzania. Participants included a range of post-harvest stakeholders.
- A meeting was held with key representatives from the agro-input private sector in Tanzania in March 2005 to share the research findings into the use of DEs as grain protectants (project R8179) in Tanzania and Zimbabwe, and to stimulate their championing of the registration process in Tanzania (see Stathers et al. 2005).
- Case studies on the bearing of diverse policies, their formulation and implementation, on the post-harvest situations in Tanzania and Zimbabwe respectively, have been undertaken, (and for Tanzania) shared and reviewed.
- Set of recommendations based on multi-stakeholder reviews of the case studies associated with output objectives 2 and 3, for improving responsiveness to farmer demand, have been generated (see Morris et al. 2005b; Mvumi et al. 2005).
- Steps for improving both policy formulation and policy implementation in Tanzania and Zimbabwe respectively, have been identified and drawn up by PHILA members at the review workshops (see Morris et al. 2005b; Mvumi et al. 2005).
- A set of working principles and practice (briefing note), derived from the LA experience and proposing better ways by which organizations and individuals in the national post-

harvest system might work and learn together, to improve uptake and adoption of post-harvest knowledge by end-users, is being prepared.

- Literature on the requirements of small-to-medium agro-processing systems for effective manufacturing and marketing, and on agro-processing service provision, research and extension linkages in Zimbabwe, has been reviewed and synthesized (see Mhazo et al. 2005).
- Participatory agricultural development planning exercises have been initiated in 2 districts in each country; associated multi-stakeholder processes, tools and techniques have been developed and shared with the respective district personnel and PHILA members. One of the district councils, Singida, has since adopted key elements of this approach in its district agricultural development planning.
- Key stakeholder types with whom PHILA needs to build and foster relationships have been identified (see Box 3), and the process of engagement introduced into strategic planning.
- PHILA's strategic action plans for Tanzania, drawn up by the membership; envisage PHILA playing a mainline role in the workings of the Ministry of Agriculture, Food and Cooperatives (MAFC), and/or MAFC continuing to play a major role in PHILA's future.

### **Box 3. Key stakeholder types with whom PHILA needs to build and foster relationships**

- Those who are in a position make decisions or effect changes in policy and practice (e.g. policy makers, district councilors and service providers, innovative farmers);
  - Those who can influence these decision-makers directly (e.g. members of parliament, private sector companies);
  - Those in civil society who can bring pressure to bear on decision-makers
  - Those who can support, reinforce and strengthen PHILA's recommendations (e.g. training, academic and research and organizations, and financial organizations );
  - Those in the media who provide a means by which the alliance can reach the public; and
  - The donor community, who can finance and support PHILA's activities.
- Some of these stakeholders may already be members of the alliance, but many others are still outside the alliance, suggesting that either enrolment or engagement initiatives are required.

## **DISCUSSION OF LESSONS LEARNT**

### ***The system-ware approach***

Innovation system approaches stress the fact that research takes place within a socio-economic, political and environmental context, and that a wide range of organizations and institutions play a role in translating ideas/knowledge into widespread social and economic use. The rationale for adopting a LA approach was to improve the working of the innovation system through 'doing things differently', to overcome constraints in the institutional arrangements (i.e. in the mechanisms, rules and customs which determine how people and organizations interact with each other) – a 'system-ware' approach.

Morris et al. (2005b) identified two 'levels' of institutions, based on Williamson's (2000) hierarchical classification scheme, which LAs could be expected to influence in the short to medium term. The first relates to rules defining governance structures, incentive structures, business contracts etc. – and we include here policy (e.g. agricultural extension, pesticide registration), and research and development (R & D) programs. Williamson, who refers to this level as 'the play of the game', suggests it leads to the building of organizations and networks, and has a frequency of change within a 1 to 10 year period. The game of influence of course plays two ways, and while on the one hand LAs might influence governance structures, incentives etc., the LAs themselves, their constitution and processes, are in turn influenced by the prevailing play, and its players.

The second level is described by Williamson in terms of allocation mechanisms (e.g. rules relating to trade flow regimes, social security systems) and effects adjustments in prices and outputs, incentive alignments. We include here rules governing staffing arrangements, and access to, and use of information communication technologies (ICTs). Williamson suggests their frequency of change is short term and continuous.

### ***Inter-organizational working***

The LAs not only brought different organizational stakeholders from multiple organizations within the respective agricultural systems together, but have provided a safe and effective space for them to work and learn together, improving inter-organizational relationships. There was already, for example, some cooperation between public and NGO service providers, but also rivalries, and in some quarters outright hostility. Working in alliance allowed for complementarities to be developed and inefficiencies reduced, both for the benefit of their mutual clients. Action research by groups of local partners moreover, built or strengthened local capacity for adaptive management. This was exemplified by the district nodal studies (CS3), which effectively were participatory planning exercises, and have been followed up by the respective districts.

The approach is also based on information-sharing, both of products and processes, and on joint planning for strategic engagement with key stakeholders (Box 3) who may not be part of the alliance. In response to the former, the project's attention was drawn to resource and capability skews associated with access to and use of modern ICTs. Significant effort and resources were focused on addressing these shortcomings. In the exchange visits for example, CS6, farmers were given disposable cameras and introduced to video diaries, both to facilitate the direct learning experience, and to provide for later sharing with family and neighbors. All told, the LA experience has led to a much more realistic understanding, both of the essential inputs and costs, and of the challenges and opportunities associated with the establishment of multi-stakeholder, multi-agency, multi-levelled learning alliances.

### ***Policy implications***

Many SSA countries have recently reformed their agricultural extension policy objectives, typically under *encouragement* from donors, and now place emphasis on pluralism, farmer empowerment, client-focused and demand-led services (MoFA 2003, MAFS 2003). Fine implementation strategies have also been drafted with donor help, but operationalization is still very much work in progress, and at this level, donor commitment is notably less in evidence.

The policy review (in Tanzania) (CS8), has generated concern amongst alliance members about the apparent isolated nature of policy formulation, the predominance of senior government officials in the process, and conversely, poor levels of engagement with and involvement of civil society and other stakeholders. Similar findings were reported in the policy review for Zimbabwe. District staff complain that there is no process in place to explain to them, let alone to farmers, what agricultural or other policy implications are to their own activities, so they tend to function oblivious of recent policy initiatives. Members are also concerned about the complexity of policy language and argue that existing policy needs to be made more accessible (e.g. use of farmer networks, radio programs). With regard to policy implementation, members' suggestions include posting summary local language versions on village notice-boards, multi-stakeholder strategic planning initiatives (e.g. CS3), regular evaluations of policy implementation and wide sharing of that information, and

training on policy issues. PHILA is in the process of lobbying for improvements to existing policy processes, but is hampered by resource and time constraints. However, minor success has been scored in drawing attention to the technical limitations and instigating change in Plant Protection Act in Tanzania.

### ***Commercialization and product registration***

Engagement with agri-business, which was spurred on by the earlier work on DEs, has had mixed success. DEs offer a considerably safer grain protectant than those synthetic pesticides already in use. However, as the main suppliers of these existing pesticides, agri-business is unconvinced that imported DE products would be more profitable than existing pesticides. The situation may well change over time, should conclusive knowledge about the dangers of organo-phosphates be taken up by the authorities and/or agri-business become more responsive to corporate social responsibility. The real benefit would come from local production of DEs, which would probably lower its market price. Local production, however, seems a long way off, not least because of the cost of mining, regulation and production. Growing use of imported DEs might convince mining companies to proceed, because of the demonstrable market. It is also possible that the costs of local DE mining will be met, because of other industrial uses for DEs (e.g. in paints, filters).

In this case, neither the good science nor the adoption of an LA approach, has succeeded as yet in addressing the barriers to registration and commercialization in Zimbabwe and Tanzania; and in the latter country this is despite the involvement of the regulator in the alliance. This institutional or system-ware failure may not, however, typify all innovation systems; parallel entrepreneurial initiatives in Zambia, prompted by the earlier DE studies and using local DEs, are already more commercially advanced.

### ***Vulnerability and adaptive capacity***

If LAs are to authentically accommodate grassroots linkages, and service provision is to be more responsive, then ways have to be found to learn about and develop responsive capacity to address the multiple constraints and circumstances to which farmers are exposed. Inadequate and erratic rainfall, for example, typically leads to poor harvests and food shortages in the project districts, with more vulnerable households and individuals suffering most. The enquiry tool, CS5, which enables extension staff (and others) to listen to and learn from farmers, provides a means for systematizing information gathering about household food production and post-harvest practices, which is much needed to counter prevailing ignorance and to penetrate the private and often secretive nature of grain storage practices. Having a clearer understanding of the circumstances and manifestations of poverty amongst rural households and communities will ensure that proffered solutions better match needs and priorities. The extent to which this learning will be 'institutionalized' within the respective structures remains to be seen, but continued interest and use of the enquiry tool suggest room for optimism.

### ***Learning about learning***

Much of the PHILA experience has been documented and is available on the PHILA website, <http://www.nri.org/PHILA/>. An assessment of the level of member participation in alliance-related activities and the extent of interaction that occurs between members is presently being undertaken.

## PERSISTING CHALLENGES

LAs provide alignment for the three key components of innovation: the *hardware* which enables technological innovation; the *software* which through action research develops compatible mindsets and adaptive capacity; and the *system-ware* in which constraints in the institutional environments, outside the remit of conventional research approaches, can be systematically addressed. As such, LAs offer a strategic approach for developing the much-sought after empowering, client-oriented, demand-led services:

- Establishing LAs – most typically building on existing networks – involves high front-end transaction costs; donors who are happy pushing at the forefront of policy development, should equally consider stepping up to meet the associated implementation challenges and costs. The costs may be high but the costs of not doing it are even higher – “invest now or pay later” (Barnett 2006).
- Meaningful innovation is fundamentally about changing institutional and social relationships, and developing more effective ways of learning. Technology aspects still seem to predominate, with *information* often misrepresented as *knowledge*, and ideas on *knowledge management* confined to association with *technology uptake*.
- Conflict is inherent to change. Those benefiting from the *status quo* are happy to continue dictating play but unlikely to voluntarily concede to rule changes by others. LAs need good facilitation to draw stakeholders together and enhance negotiation and conflict management:
  - existing elites will tend to exclude some stakeholders, deliberately or otherwise – *ineffective communication* may otherwise be *politically effective*;
  - private sector players with competing interests – and busy schedules – do not readily appreciate inclusive *participatory approaches*.
  - representation of farmers frequently excludes more vulnerable HHs and minority groups.
- In most cases LAs will be built on existing stakeholder-platforms or network arrangement, which may not be legitimately by-passed (or parallel structures created), but will not primarily exist for learning. Promoting institutional learning and change is essential, but incorporating this into the existing dynamic without appearing to be subversive, requires trust to be built and consolidated – a time consuming process.
- LAs are about changing the dynamics between and within organizations. They are, however, heavily dependent on the skills and energy of individuals. They are about processing ideas rather than peddling products. Learning about the relating and learning processes remains challenging. Documentation of process lessons at various levels of LAs is a daunting and time-consuming exercise, and is as yet an incomplete subject.
- If LAs are to have sustainable impact then they need both to influence and secure buy-in from policy makers and other key stakeholders who can facilitate their formalization /institutionalization within the system. Advocacy efforts are currently represented by policy briefs and outcome mapping, but other ways are needed, and much more remains to be done.

## CONCLUSION

The literature on knowledge networks – precursors to LAs – suggests that in the life cycles of such groups, the formation period typically takes between 1 to 3 years (Creech and Ramji 2004). From this perspective the formation of PHILA and development of understanding of the associated processes, after 20 months, appears to have been relatively successful and instructive. Much, however, remains to be learnt, but this will require continued support from the research and development communities (e.g. the Post-harvest Forum for Research

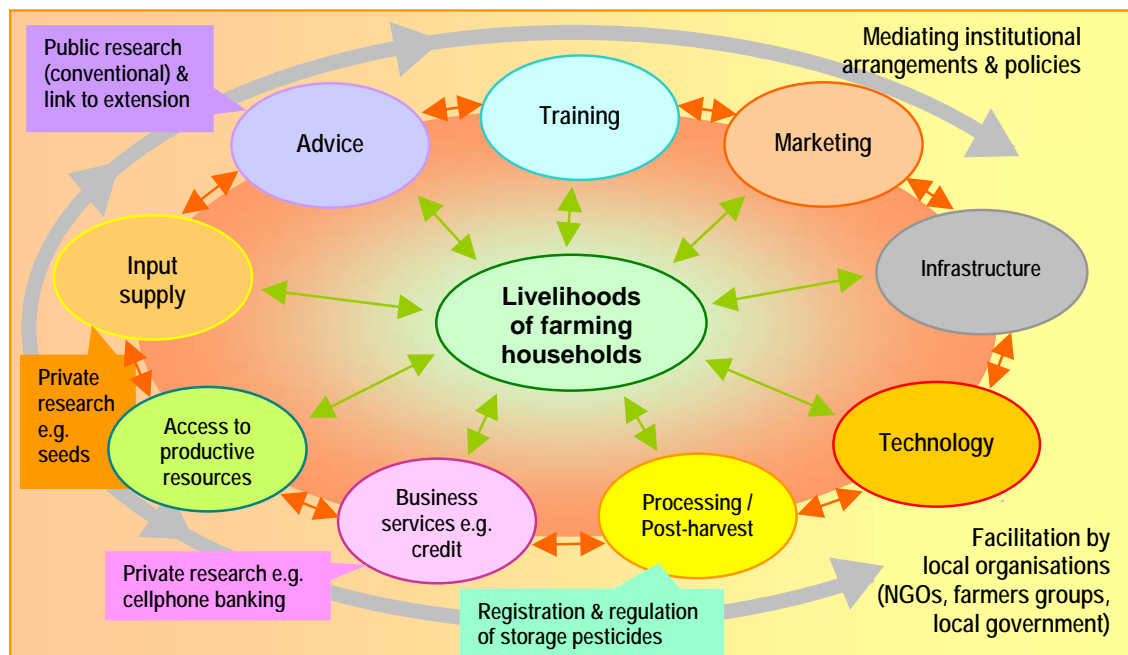
and Development in Eastern, Southern and Central Africa (PhFODESCA), Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA), Southern African Development Community (SADC), Department for International Development (DFID), World Bank, African Development Bank, European Commission etc), and continued and greater commitment from the statutory authorities to promote this challenging approach. It is also essential to ensure the extended involvement of the private sector, and the widest representation and participation of farmers' organizations and networks, including representatives of more vulnerable groups and minorities.

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**Figure 1. Innovation system from farmer's perspective (Adapted from a diagram presented by Ian Goldman, Khanya-AICDD, at the DFID workshop: 'Improving the Productivity of Smallholder Farmers in Southern Africa', held in Harare, Zimbabwe, 27-29 September, 2005.)**