

Post-harvest innovation project: Enhancing performance at the interface of supply and utilisation

Post-Harvest Innovation Learning Alliance (PHILA): Inception Workshop



Report of a Workshop organised by the PHILA management team, Plant Health Services, the Natural Resources Institute (UK) and the University of Zimbabwe, from the 15th to the 17th March 2005, at Sokoine Agricultural University, Morogoro, Tanzania

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Acronyms and Abbreviations

AEC	Actellic EC
ASD	Actellic Super Dust
ASDP	The Agricultural Sector Development Programme
ASDS	Agricultural Sector Development Strategy
CPHP	Crop Post-Harvest Programme
DALDO	District Agriculture and Livestock Development Officer
DEs	Diatomaceous earths
DFID	Department for International Development (UK)
Dryacide®	Commercial diatomaceous earth sold by Dryacide
Dumuzi	Large grain borer, Prostephanus truncatus
EC	emulsifiable concentrate
FEPU	Farmers Education and Publicity Unit
FIK	Farmer Indigenous Knowledge
GoT	Government of Tanzania
HH	Household
HIV&AIDS	Human Immunodeficiency Virus & Acquired Immune Deficiency Syndrome
IK	Indigenous knowledge
ITK	Indigenous technical knowledge
IS	Innovation System
IPM	Integrated Pest Management
LA	Learning Alliance
LGB	Large grain borer, Prostephanus truncates
LPRI	Livestock Production Research Institute, Mpwapwa
MAFS	Ministry of Agriculture and Food Security
NGO	Non governmental organisation
NIS	National Innovation System
NPPC	National Plant Protection Committee
NRI	Natural Resources Institute
Output/s	The changes (e.g. knowledge, practices) to be effected by the project
PADEP	Participatory Development and Empowerment Project
PHILA	Post-Harvest Innovation Learning Alliance
PHMS	Post-Harvest Management Services
PHS	Plant Health Services
PM	Project Memorandum
Protect-It®	Commercial diatomaceous earth sold by Hedley Technologies Inc.
PRSP	Poverty Reduction Strategy Paper
SACCOS	Savings and Credit Cooperatives
SMEs	Small to medium enterprises
TASAF	Tanzania Social Action Fund
TPRI	Tropical Pesticides Research Institute
UZ	University of Zimbabwe
VEO	Village extension officer / bwana shamba
ZRELO	Zonal Research Extension Liaison Office/r

I. Report introduction

This report is based on work undertaken at the inception workshop for the project, '*Post-harvest innovations: Enhancing performance at the interface of supply and utilisation*', which was held from the 15th to the 17th March 2005, at Sokoine Agricultural University, Morogoro, Tanzania. The occasion of the workshop also provided the launch pad for the *Post-Harvest Innovation Learning Alliance (PHILA)*, which is a network of individuals and organisations sharing post-harvest interests that seeks to establish better ways by which such organisations might work and learn together.

Box 1. Post-Harvest Innovation Learning Alliance

Post-Harvest Innovation Learning Alliance (PHILA) is a network of individuals and organisations with an overlapping interest in post-harvest issues (i.e. harvesting, storage, processing, and marketing). Members share a common understanding of the underlying problems:

- household food security remains precarious, with food production levels showing no or little increase;
- post-harvest service provision and supporting research initiatives have focused on the development of technologies with less attention being paid to distinguishing between the needs and priorities of different households, to exploring farmers' own research capabilities, or to understanding delivery system constraints.

PHILA members are committed to sharing their expertise and resources, with the aim of better mobilising the national (in-country) post-harvest innovation system to sustain the uptake and adoption of post-harvest knowledge by poor farmers.

PHILA is open to all individuals and organisations with an active interest in post-harvest innovation systems.

Contact Mr William Riwa, Plant Health Services Division, Ministry of Agriculture and Food Security, P.O. Box 9071, Dar Es Salaam, Tanzania, for more details.

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The aims of both the project and the learning alliance are to generate and promote new ideas as to how the national post-harvest innovation system can be better mobilised to sustain the uptake and adoption of post-harvest knowledge by poor farmers. While the establishment of the alliance was prompted by the needs of the project – an approach to deliver the project's commitments – it is anticipated that PHILA will expand and continue beyond the project's short lifespan. This report has been structured with the intention of providing members of the alliance and other interested readers with a clear understanding of the project and its proposed activities, of sharing relevant additional information, and promoting further opportunities for PHILA members to increase their involvement in the project and with one another.

Process: We are seeking not simply to record the content of workshop presentations and exchanges - 'what' was presented or said - but also to capture the context – 'why' and 'how' things were done - and thus provide an opportunity or space for reflection and learning. Was the 'why' objective realised? Could the 'how' have been improved? Remarks on process will be recorded in italics and boxed like this - and again participants are invited to make suggestions for improvements in the documentation of process.

The report does not necessarily follow the chronology of the actual workshop nor meticulously reproduce the details from all the sessions. Additional ideas and reference material are introduced where it is felt that these will add value for the reader. The format is also in response to some of the key preferences expressed by the participants during group work in the workshop on communications and report writing. We will moreover, use an iterative process in its production (and all subsequent documentation), including inviting all participants to comment and make suggestions as to how the report might be improved.

Only edited versions of workshop presentations, exchanges and group work will be presented in the main body of the report, except where presentation material is concise and reasonably short, in which case it may be reproduced in full. Longer or additional material will be included as an appendix in electronic versions, or be available as an annex to printed versions. Additional commentary may be introduced where value – planned or incidental - can be added to the combined findings of the group work.

II. Workshop planning and design

Process: The aim of this and the two further workshops was to provide a fulcrum around which the learning alliance members could

engage with the project and post-harvest issues generally.

The workshop as planned for in the project memorandum (PM) states that "the project will be structured around three workshops that will serve to progressively engage national PH innovation systems players, and to focus project activities – debate, design, commissioning, implementation etc. – and outputs, including and specifically the institutional learning and change component".

The two in-country management team members¹ drew up a list of participants and produced a draft workshop programme which was sent to potential participants. Some invitees had been identified during the project proposal phase. Mr William Riwa, the in-country project manager, arranged the venue and accommodation.

The full management team only met briefly to review workshop arrangements on the preceding day due to constricted working schedules and delays in Dar-es-Salaam. A number of changes were made to the programme, including that the workshop objectives be made more general than those initially set out in the invitation (which could become indicators or workshop outcomes):

- To introduce the project, secure and/or consolidate ownership of the project by a selection of players in the post-harvest innovation system.
- To share post-harvest information, and in particular, the use of Diatomaceous Earths (DEs) as grain protectants.

Further ad hoc changes to the programme were made with the intention of better realising the workshop objectives.

III. Workshop Introduction

The workshop was opened by Dr Y Nyakunga, Assistant Director, Plant Health Services. A copy of his speech is reproduced as Appendix VII.

After introducing themselves, participants noted down their expectations for the workshop which were subsequently displayed. **Process:** The invitation to a senior member of staff from the Ministry of Agriculture and Food Security to open the workshop was in line with protocol. For the project to realise its purpose however – the generation and promotion of new knowledge geared to mobilising the national innovation system in sustaining the uptake and adoption of crop post-harvest knowledge for the benefit of the poor – it is essential that senior personnel in the 'innovation system' are supportive and understanding of the work, to better ensure the promotion and scaling-up.

IV. Innovation Systems – what's that?

Vast sums of money have been spent on research and development initiatives in Tanzania to improve rural people's livelihoods. Post harvest service provision and supporting research initiatives have most often focused on the development of technologies and/or on cash crops and the market, with less attention being given to exploring farmers' own research capabilities, to distinguishing between the circumstances, needs and priorities of different households, or to developing understanding of delivery system constraints. Most of these initiatives however, whether intended to increase productivity and/or address poverty, have met with only limited success.

The Agricultural Sector Development Programme (ASDP) currently being implemented by the Government of Tanzanian (GoT) seeks to address this situation. Its aim is to facilitate the creation of an enabling environment that is conducive to improvements in agricultural productivity, in order to both improve farm incomes and reduce rural poverty.

The concept of an 'enabling environment' is very much in keeping with an *innovation systems approach*. Conventional approaches to agricultural development have tended to regard *innovation* as the product of research, and view its dissemination - or scaling-out - as a largely linear process confined to researchers, extension staff and farmers, in which the research findings are assumed to provide the motive power (see Figure 1).

¹ The present core team which derives from the parent DE project comprises: William Riwa (PHS, MAFS), Tanzania; Brighton Mvumi (UZ), Zimbabwe; Tanya Stathers (NRI), Tanzania; and Mike Morris (NRI), UK.



Figure 1. Conventional dissemination models focus on Research (R), Extension (E), Farmer (F) linkages

More recent approaches to improving the impact of research and development place greater emphasis on the rapidly changing socioeconomic, political and environmental contexts (e.g. civil service reform and decentralisation, deteriorating extension services, changing livelihood scenarios, the HIV/AIDS pandemic, trade liberalisation, environmental degradation), and on the importance of a diversity of key actors and organisations to the scaling-up processes.

New products and processes are deemed to be brought into economic and social use through the activities of these networks of organisations, as mediated by various institutions and policies (see section XI), which together – organisations and the institutions (or the 'rules' that determine their engagement) – are referred to as the *innovation system* (Hall *et al.*, 2004)². The key challenge to effecting *impact* is not perceived in terms of devising new technologies – *doing different things* – but in bringing about changes in how the innovation system works – *doing things differently.*

Box 2. Institutions and organisations

'Institutions' here refer to the mechanisms, rules and customs by which people and organisations interact with each other (i.e. the 'rules of the game'). 'Organisations' by contrast refer only to the structures within which people work (e.g. MAFS, PADEP, INADES). Marriage is for example an *institution*, because the term conveys the operational rules specific to that relationship. Statutory and customary law are also *institutions*, as they too determine the interactions between organisations and individuals.

V. Project background

Prior to this project the present management team, led by Tanya Stathers, was involved in another research project which sought to explore the potential of inert dusts as grain storage protectants: "Small-scale farmer utilisation of diatomaceous earths during grain storage".

The Diatomaceous Earths project

Diatomaceous earths (DEs) are soft whitish powders formed from the fossils of tiny planktons which live in oceans, rivers and lakes. These fossil deposits can be mined, ground to a powder, dried and admixed with grain to kill the insects that infest and attack it. When DEs come into contact with insects they absorb the wax from the skin of the insect, causing water loss, dehydration and subsequent death.



DEs have extremely low toxicity to mammals and are therefore very safe to mix with food. In addition to imported commercial DE products, there is a potential for exploiting existing deposits in sub-Saharan Africa.

This 'parent' project sought to address the

problems of storage losses frequently prioritised by small-scale producers in semi-arid areas of Africa. The research hypothesis was that DEs are effective and acceptable grain protectants for use by small-scale producers during on-farm storage in areas where LGB is endemic, and would provide an alternative to the use of organophosphate chemicals.

A second hypothesis was that local sources of DEs might produce an even more cost-effective method of grain protection for small-scale producers.

The proposed project output objectives focused on testing the efficacy of commercial DEs at village level, and similarly on exploring the efficacy of DEs secured from local regional sources. In addition to these technical components, complementary output objectives related to exploring the acceptability of DEs to farming households, advancing dissemination and promotional aspects of the new technology,

² Hall, A., Mytelka, L. and Oyeyinka, B. (2004), Innovation systems: What's involved for agricultural policy and practice, ILAC Brief 2, October 2004, 1-4.

and to involving relevant stakeholders in evaluating the different project activities.

The technical research, which was carried out over three seasons, demonstrated that DEtreated grain stored for a 10-month period, experienced minimal levels of insect damage. While the synthetic pesticides, bought from a registered stockist and applied as recommended were found to be effective, grain treated with various traditional treatments or left untreated over the same period was severely damaged. These findings were corroborated by farmers who used their own criteria to assess the quality of the differently treated stored grain (see Flyer "Farmers' livelihoods: what role for grain protection?").

Selected farmers ran trials in their own homes, which also confirmed the effectiveness of DEs.

Additional research was carried out to explore the diverse circumstances and post-harvest needs of different households. These findings show that quantities of grain that are stored and sold, and treatment practices, differ enormously between households in the same location, and are themselves dependent on diverse sets of factors and circumstances. Figure 2 sets out a framework of such factors and circumstances. Confirmation of the diversity of the rural clientbase highlights the importance for service providers to tailor any recommendations to the needs of different households, as opposed to using a 'one-size-fits-all' approach.



Figure 2. Factors / circumstances influencing farmer post-harvest decision-making

Those farmers who were involved in the testing of DEs would like to be able to purchase and use these effective grain protectants. The Ministry of Agriculture and Food Security is also keen to see these safe grain protectants available in Tanzania. The challenge now is for the private sector to develop this business opportunity through importation, distribution and marketing of existing commercial DE products, and/or exploitation of the local DE deposit.

As with any product that is to be used in contact with food stuffs, DEs will need to be officially registered with the Tropical Pesticides Research Institute (TPRI) before they are made available to the general public. TPRI have been actively involved in the research programme and are also keen that farmers are given the choice to protect their stored food using an effective, safe and non organophosphate based grain protectant.

VI. Reflections on the DE project

Issues arising from the DE project

Process: Following presentation of the 'parent' DE project, participants were asked to discuss and note down the key issues that had emerged from the presentation.

The intention of the work, which participants undertook in pairs, was not only to identify constraints in the process of researching DEs and making the technology available to farmers, but also to explore to what extent constraints might be applicable to the scaling-up and scaling-out of other research-generated (postharvest) technologies.

The paired participants wrote each identified issue on a separate 'stickers'. All the stickers were then displayed, and subsequently grouped by the facilitator under different themes.

The following 'callouts' present clusters of issues identified by the participants, working in pairs, after hearing about the DE project:





dubious materials could be ground and sold as DE?



Accessibility of DEs for resource poor

households after registration

Learning from the DE issues

While some of the identified issues are specific to the promotion of the DE technology (e.g. presence of DE deposits in Tanzania, specific rates of application), most issues would apply to other storage protectants (e.g. safety aspects, registration processes) and many would apply to most post-harvest technologies (e.g. farmer diversity, availability, accessibility, affordability).

The DE research was undertaken to address the problem of post-harvest storage losses due to insect damage that is frequently cited as a major problem by many small scale farmers. In working on a solution to this problem, and as the identified issues suggest, one discovers not only that the process involves stakeholders outside the research, extension, farmer *trilogy* (see Figure 1), but also that the context is dynamic and complex.

The farming community, for example, is seldom homogenous. Some households may be food sufficient most years, and sell their surplus commodities; while others may not be able to afford a commercial grain protectant, or not have sufficient surplus to warrant treatment. Participants also suggested that there may be an argument for changing farmers' attitudes; *but should this change only apply to farmers and not researchers and service providers*?

Box 3. Stakeholders

Stakeholders are not only those individuals or groups who stand to gain from an initiative or intervention such as technology development, but also those who may lose out as a result of the development, and may consequently have reason to stand in its way. If one wants to scale-up a technology then it is important to know and understand who all the stakeholders are and endeavour to engage them.

The situation for extension staff is similarly complicated. These stakeholders may come from different organisations, or different parts of organisations, and occupy different slots in the administrative hierarchy (e.g. Plant Health Services, Post-Harvest Management Services, district extension staff, village extension officers). Researchers too are split between different organisations and different disciplines (e.g. natural sciences, social sciences) and also have different interests, motives and beliefs.

The registration of DEs is recognised as an outstanding issue. To date, the project has actively engaged staff from the Tropical Pesticides Research Institute (TPRI), the organisation which typically runs trials on new products and is responsible for regulating product use. The process will also require a private sector player with suitable commercial credentials to formally 'champion' the registration.

Stockists, policy makers, and miners (private sector) are mentioned, with further implicit references to agri-business, policy advisors, environmental health agencies etc.

The *issues* pick out both specific constraints (e.g. registration constraints) or challenges in the relationships between different players (e.g. *linking* researchers, policy makers, extension staff and end-users, *involving* policy makers, *engaging with* the private sector).

In effect the emerging picture resembles the *innovation system* outlined in section IV above, which referred to new products and processes being brought into economic and social use through the activities and interactions of networks of organisations, and how the key challenge to effecting *impact* is less about devising new technologies – *doing different things (researching)* – and more about effecting

changes in how the innovation system works – doing things differently (relating).

It is this wider systemic challenge that our new project, "*Post-harvest innovation: Enhancing performance at the interface of supply and utilisation*", attempts to address.

VII. Introduction to the current project

"Post-Harvest Innovation: Enhancing the performance at the interface of supply and utilisation."

Project overview

Household food security remains precarious for large numbers of people in the rural areas and food production levels show little or no increase. Post harvest service provision and supporting research initiatives have focused on the development of technologies with little attention being paid to distinguishing between the needs and priorities of different households or to understanding delivery system constraints.

The project will identify constraints and opportunities at the supply-utilisation interface associated with 'responsiveness' and 'demand' respectively. These insights will be used to generate recommendations for in-country postharvest knowledge managers that facilitate and promote more equitable or 'inclusive' approaches to addressing rural poverty.

Process: This and the parent project are funded by the Crop-Post Harvest Programme (CPHP)³. Read more about the CPHP on their website: www.cphp.uk.com. In mid-August 2004 CPHP invited existing project coalitions to submit ideas – 'concept notes' – for further oneyear long projects, in line with their overall strategic objective (Programme Purpose) that:

"National and international crop post-harvest innovation systems respond more effectively to the needs of the poor."

In addition the concept notes, which were to be commissioned as short, value-adding projects during 2005-2006, were to address the specific objective (Programme Output) that:

³ CPHP is one of the funding agencies that comprise the Renewable Natural Resources Research Strategy (RNRRS) of the UK Department for International Development (DFID). These ten-year programmes are now in their final year.

"New knowledge (be) generated and promoted into how national innovation systems can be mobilised to sustain uptake and adoption of CPH knowledge for the benefit of the poor."

CPHP identified the central research question as: how can the use of existing information be facilitated within the post-harvest sector in their four focus regions (Southern, East and West Africa and South Asia)? They were seeking both to consolidate past CPHP research, and to conduct action research on processes, approaches and technologies whereby existing post-harvest information from diverse sources feeds into decision-making at different levels e.g. farmers, policy-makers, traders, agribusinesses, donors, research managers, etc.

We were invited to develop our concept note, 'Post-harvest innovations: Enhancing performance at the interface of supply and utilisation,' into a full project memorandum (PM). The basic format for the PM includes a 'logical framework' (logframe). Guidelines for developing a logframe can be accessed via the CPHP website: www.cphp.uk.com.

The project was nominally to start 15th January 2005, and finishes 15 January 2006, but there was a month's delay in issuing the contract.

The project logical framework (or *logframe*) is set out in Appendix II, and comprises a set of nested objectives: the goal, purpose, and output objectives. Only the 'outputs' are under the control and within the time span of the project, but their realisation or delivery may too be affected by external factors, (some of) which are identified as *risks* and/or *assumptions* in the right hand column of the logframe.

Project goal - long-term objective

The goal for this and the other parallel projects commissioned by CPHP, which equates to the purpose of the CPH Programme (see process box), is that:

National and international crop-post harvest innovation systems respond more effectively to the needs of the poor.

Project purpose - medium-term objective

The purpose of this and parallel CPHP projects, which equates to an output of the CPH Programme, is that:

New knowledge is generated and promoted into how national innovation systems can be mobilised to sustain uptake and adoption of CPH knowledge for the benefit of the poor.

It is anticipated that the changes effected by the project - or in logframe jargon, the 'outputs' (or deliverables) - will over time, together with those from parallel CPHP projects, deliver the purpose objective. The project logical framework however identifies risks or assumptions which might adversely or otherwise influence the degree or quality of realisation of the planned outputs.

Output objectives and associated activities

1. Institutional learning and change: The first output objective relates to exploring ways that learning alliance members (see section XI) might better relate to each other and learn together - *doing things differently*:

To advance improvements in understanding and effectiveness of 'learning alliances' (LAs) as agents of change.

Planned activities relating to this objective include:

- Workshop presentation on 'learning alliances' (LAs).
- Identification / confirmation and engagement of LA partners.
- Review of 'learning alliance' performance (after commencement of other output activities).
- > Draft briefing paper on 'learning alliances'.
- > Final briefing paper on 'learning alliances'.

2. Knowledge management by service providers and supporting research: The second output objective focuses on assessing current service provision and supporting research initiatives:

To develop practical 'insights' from current working practices, and to generate 'improved practice' recommendations.

Planned activities relating to this objective include:

- Interface analysis of public service provision and public sector research (Case Study 1).
- Interface and comparative analyses of (Case Study 2).
- public service providers & farmers;
 farmer-centred organisations & farmers.
- District 'nodal' studies (Case Study 3):

- stakeholder workshop to establish what is and isn't working well;
- key informant interviews.

3. Demand and utilisation: The third output objective examines the demand side of the equation, focusing on farmers in the general context, and on commercial enterprises in the narrower context of manufacturing and distributing PH storage protectants:

Figure 3. Diagram depicting District level interfaces



To explore and improve the ability of (i.) farmers, and (ii.) commercial enterprises, to access and utilise relevant PH information.

Planned activities relating to this objective include:

- Empowerment / people-focused studies (Case Study 4):
 - Definitions what is empowerment?
 - Study of 'empowerment' initiatives (eg PADEP, Unions, HIV/AIDS campaign, SACCOS, 'Groups' in study villages?
- Household 'enquiry visits': learn to listen, and listening to learn from farmers (Case Study 5).
- Farmer & frontline extension staff exchange visits (Case Study 6).
- Interface analysis of commercial enterprises and service providers (and supporting research providers) (Case Study 7).

4. Policy and implementation strategies: The fourth output objective, builds on the findings of the first three, and relates to optimising the impact of new knowledge on the national PH innovation system:

To generate and promote recommendations for policy and implementation strategies that will improve the performance of PH service providers & researchers and enhance related decision-making by farmers and commercial enterprises. Planned activities relating to this objective include:

- Literature review on PH policy experience, advice & formulation (Case Study 8).
- Synthesis report based on literature review, & findings from Outputs 1,2 and 3.
- Review of synthesis leading to 1st draft of recommendations.
- > Final recommendations.
- Promotional meeting with national innovation systems players.

Project time span

The time span for the project was to have been 15th January 2005 to 15th January 2006. Issuing the contract was delayed by a month, which in turn caused knock-on delays amongst the project activities

VIII. Alliance members' PH experiences

Process: Both to realise the workshop's 'ownership' objectives and to ensure that the alliance was centred on contributions from all, and not just the management team, it was felt essential to provide participants with an early opportunity to hear and learn from each other.

An invitation was therefore extended in the advance programme, and repeated on the first day, for interested participants to prepare short presentations of their post-harvest experience, for delivery on the second day of the workshop. A number responded.

A number of individuals volunteered to share their organisations' post-harvest experiences with the workshop participants, and these are briefly presented below.

Central Zone; Livestock Production Research Institute, Mpwapwa, Judicate MWANGA, Socio-economist (See Appendix IV for extended written presentation).

Central Zone research is mandated to work in the nine districts of Dodoma and Singida regions, catering for both livestock and crop research. The focus includes both pre- and post-harvest.

Expertise is limited in certain domains so the centre 'borrows' staff from the Ilonga Research Centre in Eastern Zone.

Status of post-harvest losses

Post harvest losses in central zone range between 30 to 40%. The zone is prone to erratic rainfall hence magnifying farmers' food insecurity. Countering pre- and post-harvest losses revolves around four major themes:

- Pest and diseases management
- Harvesting technology and quality control
- Storage and marketing
- De-husking/dehulling and processing (value adding).

Main causes of post harvest crop losses

- Fungal infections (e.g. moulds and smuts).
- Pre- and post storage pests: including Prostephanus truncatus, Tribolium confusum and Sitophilus spp. Prostephanus starts right from the grain fields. Root nematode (Meloidogyne spp) is still new to tomato farmers; onion termite is also becoming menacing.
- Noxious weed (e.g. striga in sorghum, maize & upland paddy).
- Birds (quelea quelea, love birds).
- Domestic animals.
- Wild animals.
- Milling loses due to poor grain characteristic (e.g. some rice varieties)
- Inefficient machinery.
- Inappropriate drying facilities hence reduction in quality

Mitigation against post harvest losses

- Application of IPM.
- Application of ethno-botanicals and other locally available ITK.
- Application of pre- and post-harvest insecticide.
- Timely harvesting after physiological maturity.
- Grading.
- Sorting.
- Drying (solar driers) to control moisture.
- Parboiling in case of rice.
- Proper de-hulling e.g. rubber rollers for rice and sorghum.
- Value-adding as a marketing strategy.

Farmer practices in central zone

In seed treatment, farmers are using powder soap (Omo) against smut, (CKS) while others are using kerosene. Farmers are also using wide range of methods in controlling post harvest losses, including ethno-botanicals. Others practises include solar drying, use of air tight containers (e.g. mammoth-gourds, plastic containers) and smoking.

Experiences on post-harvest service provision from public extension – Singida District; Delfine MOSHI, PADEP District Officer:

- Singida District is made up of seven Division, 28 wards, 146 villages and 840 subvillages.
- Food crops grown include: sorghum, maize, bulrush millet.
- Rainfall 600 700 mm per annum.
- Post harvest losses experienced each year are about 30 - 40%. The attack is largely experienced in stores/storage structures.
- Storage structures include: vilindo, sacks, and vihenge. The structures are located in the living accommodation which typically has unplastered walls where insect pests can hide and infest crops the following season.
- Synthetic pesticides used by farmers to protect grains against stored pests include: Actellic Super Dust (ASD), Actellic 50 EC and Shumba dust.
- Local materials used include: wood ash, ash from cow dung, plant materials e.g. Bangi ya mbwa (marigold).

Farmers continue to complain about the low effectiveness of Actellic Super Dust. Reasons identified with this failure include:

- Inadequate application rates due to high price of pesticide.
- Improper application method (chemicals not mixed with grains properly).
- Grains already infested from the field; insects inside the grain avoid contact with chemicals.
- Storage structures open at the top; ventilation reduces toxicity period of the chemical.
- Unplastered walls allow easy ingress for insects.
- Farmers' belief that actellic is made to kill insects, leads to use as a cure after infestation rather than as a grain protectant.
- Sale of chemicals by shops & markets (minadani) that are fake or past sell-by dates.

As extension workers we have been advising farmers on the following:

 Use of proper method and rates of application, and on air tight containers.

- Cleaning stores and storage structures.
- Continued use of local materials, but inspect crops every 3 months.
- Linking with existing initiatives (e.g. INADES, who are working with IPM; PADEP to build on).

PADEP in Singida is working with farmers in groups and the problem of storage pest is addressed in some of the groups.

Challenges faced with extension worker include: limited number of staff, funding constraints.

Post Harvest Management Services (PHMS); Department of Food Security, MAFS; Bertha John MJAWA, Agricultural Officer.

Roles of Post Harvest Management Services:

- Undertake policy issues pertaining to Post Harvest Management by preparing and maintaining favourable policies for investment and implementation of improved post harvest system.
- Disseminate Post Harvest research technologies to the target group through provision of technical backstopping and staff training.
- Prepare strategies and guidelines for improved Post Harvest system.
- Monitor implementation of improved post harvest technologies and quality standards.
- Strengthen capacity of the Government institutions for post harvest technology improvement/ development and delivery.
- Provide supportive legislative services for stakeholders involved in post harvest improvement activities.

INADES Formation Tanzania (IFTz): activities and experiences on PH issues; Patrick G. M. Lameck, Trainer. (See Appendix V for full power point presentation)

INADES Formation Tanzania (IFTz) is an autonomous, not-for-profit, NGO affiliated to the network of INADES-Formation International (IFI).

INADES' Field of Interventions include:

- Farmer organisation and farmer leaders training.
- Farmer networking from regional to national level.

- Communication, negotiation, advocacy, and lobbying.
- Land and water conservation and management.
- Marketing and economic processes (including Savings and credit).
- Crop production and animal husbandry.
- Farmers' indigenous knowledge.
- Gender.
- Income generating economic activities.

The Promoting Farmer Indigenous Knowledge (PFIK) Training programme:

- Developed with farmers Promoting Farmer local innovations Training programme.
- We work with volunteer farmer groups who have been forming Networks for joint effort
- Aim of the programme is Collect, Share, verify, document and disseminate farmer indigenous/local knowledge on crop storage, control of crop pest and diseases, animal health as well as human health.

Activities under the programme:

- Visit and identify farmers with IK
- Invite and familiarise farmers with IK as well as sensitise them to form groups.
- Farmer then display their IKs in a sharing group and network shows through workshops and exchange visits.
- IKs are then distributed to volunteering farmers to test the displayed IKs at least for one year
- Convene a feedback workshop where performance of the IKs are reported.
- Promising IKs are then documented with farmers in technical notes

Achievements include:

- Produced 7 technical notes on IK in kiswahili, the farmer language
- Farmer reported reduced running costs in crop protection, animal health as well as human health.
- Farmers with IK are resource person to various occasions such as agriculture shows Nane nane.
- Provide a reference and research area to researchers and other stakeholders.

Limitations/challenges and constraints include:

- The botanicals are limited in number and some are found in specific ecological zones.
- Some farmers with IK are not willing to share their experiences to command monopoly (source of income)

- A very slow pace by researchers to validate the IKs (Probably due to lack of mechanism, policy support, resources and mind set).
- Farmers are asking for protection of their knowledge. A question of IPR.
- In places where there are no projects farmers have no access to Crop protection information and technologies.
- Control of elegant grasshopper is still in vain.

Zimbabwe Farmers Union; Elimon MAPONDE, Crops Executive

Mission statement:

To protect and advance the interests of the farmer in order to uplift their standard of living and contribute to the national economy thereby promoting food security and enhancing poverty alleviation.

Operational structure:

National ⇔ Provincial ⇔ District ⇔ Ward ⇔ Village ⇔ Clubs

ZFU has been involved in the following:

- Launching of awareness campaigns.
- Organization of farmers.
- Marrying farmers.
- Hosting of PH technologies.
- Organizing field days.
- Production and distribution of PH materials.
- Lobby for partnership.
- Companies formed and do the distribution.
- Assist in problem solving.

Limitations:

- Insufficient resources, e.g human capital, transport and office equipment.
- High staff turnover.
- Misconception by the different stakeholders on the role of ZFU.

Tropical Pesticides Research Institute; Wilfred MBISE, Research Scientist.

- Training for various stakeholders in a range of courses
- Major activity is proposal writing, then we conduct research
- In 40 villages in Babati and Alomero we have done research on traditional storage structures
- Also research on storage efficiency of plastered and unplastered kihenges, plastering both the in and outside of the kihenge kept grain in good condition for 8 months

- Screening of storage pesticides i.e. Actellic Super dust, Shumba dust, Stocal, Super Grain Dust
- Now working on a collapsible metal silo to help farmers store without needing to use any pesticides. Also easier to transport, and doesn't take up space when collapsed. Worried about % germination of grains stored in these metal silos.
- In 2002, we tested a sample that arrived wrapped in banana leaves from Bukoba that was being used by farmers to protect seed against LGB, the sample was DE, the farmers moisten the seeds first before they use the DE. It was around the same time that Dr Kaoneka brought back DE samples from the Babati DE projects field trials.
- The research work is published in Tropical Pesticides, and presented at the Tanzanian Entomologist Association (next meeting is 28-30th Nov 2005).
- TPRI presentations have been broadcast on radio in the Northern Zone and have generated questions from farmers.

IX. Reviewing outputs and activities

Process: It was assumed that most participants would either not have seen or not have had a chance to familiarise themselves with the project proposal. The aim of the workshop was however to broaden the ownership of the project and seek buy-in to the learning alliance.

One way it was felt of doing this, was to invite the participants to review the project's outputs and activities and to make suggestions as to how they might be improved, either practically, strategically, or in terms of reducing the jargon and putting them into readily understandable English.

This work, which took place on the first day, was undertaken in three groups of six or seven people each.

Working in three groups the participants reviewed project outputs 2 and 3 and their associated activities, as written down in the project memorandum (PM).

Output 2 in the PM reads: Facilitation of incountry PH knowledge management: Practical 'insights' from current working practices

developed, and improved practice recommendations **generated**.

Output 2 modifications suggested by Group 1:

Processes and mechanisms for generating and utilisation of post-harvest knowledge as used by different categories of service providers, investigated. Practical 'insights' from current working practices developed and improvedpractice recommendations developed.

Groups 2 & 3 did not recommended any change

Group 1 has expanded the output, but feelings were mixed as to whether it has added value or introduced more clarity. The use of the term 'knowledge management' in the original output had given rise to confusion for some people.

Box 4. Knowledge and knowledge management

Until relatively recently, researchers and extension staff have treated 'knowledge' as a basic commodity. Knowledge management entailed the suitable packaging of the knowledge and its channelling towards the fortunate beneficiaries (or knowledge users), who, it was assumed, would utilise it and in due course, reap their rewards. More recent perceptions of knowledge differentiate between 'tacit knowledge' and 'explicit (or codified) knowledge'. Tacit knowledge represents the knowledge locked up in people's heads (e.g. how to ride a bicycle). In the case of farmers for example, this will be their years of farming experience and familiarity with their own working circumstances. Codified knowledge is typified by that generated in conventional scientific or technical research; codified knowledge is systematised and recorded. In this scenario the interplay of both farmers' 'tacit' knowledge and scientific knowledge (stemming from research but generally managed by service providers) are recognised as essential for successful technology development. Even more recent thinking on the subject links knowledge management to the processes of 'learning' and 'relationship'. Learning here goes beyond the acquisition and moving about of bits of information, but "implies the creation of new understanding and insight through more holistic reflection, dialogue and analysis" (Pasteur and Scott-Villiers, 2004: 8).

Output 3 in the PM reads: Ability of diverse private sector players – farmers and commercial enterprises – to access and utilise relevant PH information, **explored** and **improved**.

Output 3 modifications suggested by Group 1:

Ability and commitment of diverse private sector players - commercial enterprises and farmers - to access and utilise relevant post-harvest

information, explored and improvements suggested

Groups 2 & 3 did not recommended any change

The proposed change introduces a measure of contention: '**suggesting improvements'** falls short of actually '**improving the ability'** of private sector players to access and utilise PH information; but it raises the issue of what is possible within the short project timeframe.

With respect to the output activities, most observations did not suggest significant changes. Alterations to the numbering of activities, however, were recommended, and we have since switched to referring to the main activities as (numbered) case studies.

'Timing' and synchronising activities with the farmers' calendar were mentioned, and Group 2 suggested that activity 3.3 *'methodological development, draft TOR and commissioning of 'people' focused programmes (e.g. HIV/AIDS and PHC programmes)'* could be an output in itself. They suggested it might read: *'Comparative learning from other peoplefocused programmes like HIV/AIDS and PHC programmes* (established?)'.

It is certainly hoped that 'comparative learning' will take place across all the activities, and that this will subsequently translate, into farmers being better able to access and utilise relevant post-harvest information.

Perhaps the most telling observation made related to the absence of the term 'demand', either in the outputs or in the project title. We discussed whether 'demand' should replace 'utilisation' in the project title. Arguably 'utilisation' is a more apt description of the current reality at the interface between service providers and farmers (i.e. 'demand' is the exception and not the rule). Given the short project time span it is probably more realistic to aim to *enhance performance* at this interface rather than to *increase demand* – albeit many suggest that the latter is the key to increasing productivity and addressing poverty.

We are now however referring to output 3, as the 'demand' output, and have included the term 'demand' in the Terms of Reference for the empowerment case study – case study 4. The case study objectives read: "to explore existing in-country initiatives (in any sector) that are using 'empowerment' or 'rights-based' approaches to facilitate communities or groups in laying claim to - demanding – the services they need, with a view to identifying lessons that might be transferable to the agricultural sector, and to post-harvest relationships in particular".

Box 5. Old activities, new Case Studies

Output 2, the 'service provision' case studies:

Case Study 1: Analysis of the interface between post harvest public service provision and public research.

Case Study 2: Comparative analysis of how public service providers (PSPs) work with farmers and how farmer-centred organisations work with farmers.

Case Study 3: District nodal studies.

Output 3, the 'demand' case studies:

Case Study 4: Exploring empowerment initiatives

Case Study 5: Household 'enquiry visits': learn to listen, and listening to learn from farmers.

Case Study 6: Farmer & frontline extension staff exchange visits.

Case Study 7: Interface analysis of commercial enterprises and service providers (and supporting research providers).

Output 4, the 'policy' case study:

Case Study 8: Reviewing policy and associated processes to better understand the implications for Post-Harvest practice.

X. Shaping the Case Studies

Farmer-centred case studies and institutional analysis

Process: The first day review of the outputs and activities, which had been based on the project memorandum and logframe, had been inevitably somewhat constrained. Additional group work on aspects of the case studies was proposed not only to further advance the ownership of the project by the participants, but also to ensure that the considerable experience of alliance members was brought to bear on the design of the case studies.

It was proposed therefore that two groups (of 6-7 people), explore the 'farmer centred' case studies (i.e. the empowerment, exchange visits, and enquiry exercises), and that a third group explores 'institutional analysis'.

Building on the first day's review of Outputs 2 and 3 and their respective activities, participants were invited on the second day to explore in more depth, the methodological challenges of carrying out the different case studies. This was to focus on the 'farmer-centred' case studies and on 'institutional analysis'.

A summary of the work is presented in the following boxes.

Farmer-centred case studies

Enquiry visit framework (revisited)

- The objective of the 'enquiry tool' was to develop a focused understanding of the factors which influence farmer decision-making with respect to grain storage technologies, to better facilitate the uptake of DEs.
- The approach a farmer centred approach emphasised (training research and extension staff in) listening to and learning from farmers.
- The unit of analysis was the household.
- Participating households were identified through village-based wealth-ranking exercises.
- The enquiry focused only on one crop (typically maize), but more might have been considered.
- The enquiry approach was systematic, and involved repeat visits over time.

Group 1: Observations on the enquiry tool

- Enquiry framework can be developed for groups of farmers using participatory approaches.
- If time and resources allow, the tool can be used in the new project sites.
- Will the current selection criteria allow for continued work at Mlali village, Kongwa district?

Group 1: Observations on exchange Visits

- Exchange visits within the new project sites and between the new sites and the DE sites?
- By both extension staff and farmers?
- Sites should have good (interesting?) PH practices.
- Visits should be done before June, preferably during the DE evaluation?
- What criteria might be used in selecting farmers and extension staff?
- What logistics are involved?

Farmer-centred case studies

Group 2: Empowerment / People-focused studies (e.g. TASAF - in water, livestock, education, health etc).

Lesson 1. Participation of communities during planning/formulation, implementation, monitoring and evaluation and cost-sharing ensures:

confidence building in communities

- enhanced project ownership
- enhanced performance
- sustainability

Lesson 2. Use of participatory approaches (e.g. PRA, PPA, PLA, gender sensitive tools etc.) ensures project success.

Lesson 3. Working with community groups enhances joint effort, creates demand capacity, enhances lobbying and advocacy capacity to defend rights and interests (e.g. INADES Tanzania training programmes, PADEP subprojects).

Tools used include:

- Group organisation skills
- Communication skills
- Campaigning and advocacy skills
- Income-generating activities
- Proper targeting (gender, geographical, age group, wealth status)

Lesson 4. Documentation of Project results in user-friendly language and packages facilitates rapid dissemination and spread of findings (e.g. INADES Tanzania, CPP-Central Zone).

Lesson 5. Sensitising communities on burning issues such as HIV/AIDS (e.g. INADES Tanzania, PADEP, and TASAF HIV/AIDS programmes).

HIV/AIDS reduces available human resources and affects project performance:

- increase awareness
- take preventative measures.

Tools used include:

- publicity through mass media
- leaflets and posters
- sensitisation meetings and workshops
- National campaigns e.g. TACAIDS

Lesson 6. Partnership / collaboration of key stakeholders smoothes implementation of farmerfocused programmes by having common understanding.

Lesson 7. Community service provision under cost-sharing schemes such as home-based care (e.g. Zimbabwe AIDS Project (ZAP)).

Tools used include:

- Volunteerism of community workers who give care to the HIV/AIDS patients
- Cost-sharing between (community and donors)

- Institutional networking (Churches, Councils, hospitals, local clinics, New-Start Centres⁴)
- Use of clinical/hospital records
- Mass media
- Participatory methods

Group 3: Institutional analysis

Institutions, or the institutional arrangements, are the rules, norms or customs that determine how organisations and people operate.

Organisations are the 'structures' within which people operate.

Issues identified through 'brainstorming'

- Who are the organisational stakeholders?
- What do they do?
- How are they organised?
- How do they communicate/relate:
 o internally within organisation?
 o externally with other organisations?
- What are their achievements?
- What are their constraints?
- What are their challenges?
- How do they operate? (are they a 'learning organisation' - reflecting on what they do, and modifying behaviour?)
- How hierarchical is the organisation? (are staff at different levels able to make decisions - a flat structure - or only those at the top?)
- Individuals (agents) compared with organisation (agency)
- How are they led?
- What are their vision/mission statements?
- How does the 'reality' shape-up to the vision/mission?
- What resources are available to them:
 - $_{\odot}$ staffing & staff capabilities
 - $\circ \textbf{transport}$
 - o financial resources / funds
- What are the institutional arrangements rules of engagement?
- What 'level' do they operate at?
- In which part of the PH system do they work (e.g. storage, processing, marketing)?
- How transparent are organisational transactions?
- How accountable are decision-makers?

⁴ These provide testing and counselling services at nominal rates.

- How participatory is it?
- How equitable?
- Analytical tools available
- Participatory stakeholder identification
- Stakeholder analysis
- Diagramming
- Key informant interviews
- SWOT analysis
- Output Performance Review Assessment (OPRA)
- Gender analysis (matrix)
- Content analysis(?)
- Visioning / force fields
- Timelines
- Decision mode analysis (problem tree, opportunities, strategies)
- Opportunities & Obstacles to Development (OOD)
- 'Management consultant' tools

Policy areas

- Food security policy > ASDS
- Agricultural policy
- Marketing policy
- Nutrition policy
- Local government reforms etc

Study locations selection criteria

Process: The PM proposes that studies be undertaken of the interfaces between districtlevel service providers and other stakeholders, referring to these studies as district level 'nodal' analyses. It also identifies a range of criteria that might be considered to characterise different locations, and suggests that the study districts be selected to represent, as far as possible, contrasting characteristics.

Participants were first invited to examine the location criteria with a view to developing the existing list and suggesting any necessary weighting. Secondly they were invited to identify two potential study districts in the central region exhibiting contrasting characteristics. The work was to be done in three groups.

The intention of the exercise was to effect improvements in the study site selection process based on the knowledge of the participants, at the same time as preparing and engaging them in consideration of how best these district-level studies might be undertaken.

For the purposes of the original proposal, the management team had already identified

several characteristics that might be considered to have bearing on the choice of study sites for the service provision case studies, and in particular the district nodal analyses (CS3).

It was planned that the project study areas should not be 'country-wide', but rather be confined to a single region - certainly a single zone. The practical 'insights' that we anticipate identifying, are those associated with good practice at the interface of supply and utilisation, which for many forms of 'knowledge' suggests an arena close to the 'farmer' level. Many organisations moreover - government through the de-centralisation process - locate management structures at the district level; so 'district level' actors and below, could provide one analytical focus for the study.

Study area characteristics to be considered for selection might include the following, which are mostly represented by a continuum, of which the polar extremes, where appropriate, are given:

Good service provider	+	→	Poor service provider
	•	-	
capacity			capacity
Cultural dimensions	÷	→	Cultural dimensions
Many existing	←	→	Few existing
project/interventions			interventions/projects
High potential areas /	←	→	Low potential areas /
climate			climate
Open/heterogeneous	÷	→	Closed/homogeneous
communities			communities
Readily accessible	÷	→	Remote, inaccessible
(operational)			
Good social infrastructure	←	→	Poor social infrastructure
PH complexity	←	→	PH simplicity
Livelihood diversity	÷	→	Constrained livelihoods

Group1: Study sites selection - Tanzania

This group considered the following to be the most important criteria for selecting two contrasting project districts:

- (a) Cultural dimensions in relation to PH practices.
- (b) Complexity of PH technologies.
- (c) Livelihood diversity (including socio-economic activities).
- (d) Wealth status.
- (e) Agro-ecological zones.

From the three candidate regions of the Central Zone of Tanzania, namely Singida, Morogoro and Dodoma, two contrasting districts - Singida Rural and Manyoni - were identified. Singida Rural, in contast to Manyoni, has a high potential and is well-developed.

Group 2: Study sites selection - Tanzania.

The group identified all the districts in Dodoma, Singida and Morogoro, the three regions of the central zone. Those most favoured districts were then selected - Kongwa, Singida Rural, and Kilosa on the basis of the group's experience. These were then scored (3, 2 or 1) against each of the top five characteristics. Singida scored 11 (in total), Kilosa 10, and Kongwa 8.

The exercise for the least favoured districts saw Manyoni and Ulanga districts identified as the most likely 'candidates'; from which Manyoni was subsequently selected as the least well off.

While neither group appeared to elaborate the selection characteristics, it is interesting that both groups independently identified Singida and Manyoni as the most favoured and least favoured districts respectively (from a total of 15 districts).

Group 3: Study sites selection - Zimbabwe.

Buhera district, Manicaland Province (Natural Region III/IV) and Binga Districts (Natural Region IV/V) were identified as suitable contrasting districts according to the identified criteria. However, because work has already been done in these areas, the group recommended that new wards be selected in these districts, so that the project engages with new farmers.

Buhera has well-serviced support infrastructure, mixed cultures, and is a predominantly maizegroundnut growing area. Binga is remote with poor infrastructural support; it exhibits strong cultural practices, and is predominantly a smallgrain/cotton producing area with low crop potential.

XI. Learning Alliances

National Innovation System

Process: Participants were asked to discuss in pairs what they understood by the term 'national innovation system' and to note down their thoughts on stickers. These were then presented back to the plenary.

The intention here was to actively engage participants in drawing upon existing knowledge, reflecting upon the earlier

presentation, and generally thinking through what might be meant by an innovation system.

Participants also placed stickers bearing the name of their own organisations on a diagram setting out a hierarchy of players (in line with the administrative hierarchy (i.e. national, intermediate, district, community) in an innovation system.

Working in pairs participants offered the following observations as to their understanding of the term, 'national innovation systems' (NIS) or 'innovation systems' (IS):

Participants views on Innovation Systems:

- Different ways of doing things: management, linkages, thinking mode. It involves new/ improved ideas, approaches, techniques, perceptions.
- IS: that environment where knowledge/skills are transformed into new practical applications.
- IS: problem solving mechanisms based on experience of present problems.
- NIS: processes that comprise identification, improvements and dissemination of CPH knowledge and feedback mechanisms.
- NIS: mechanisms for testing, collating and disseminating diverse knowledge from localities to wider or national localities.
- NIS: discovery or restructuring of modern or indigenous technology, and pathways for dissemination.
- IS: the mode of putting into use the appropriate technology.
- NIS: the paths (organogram?) that transfers appropriate technologies to users.
- Learn the problem from the farmer, accept their experience, make some correction from their experience, if any, and in doing so introduce a new innovation (national) for findings from research. After adoption do field days. Expansion and sustainability.
- Institutionalised CPH knowledge generation and dissemination processes at national level.
- Different approaches for developing PH technologies.
- NIS: Legal dissemination of PH technologies, initiate change.

- IS: Idea or intervention measure to solve a current problem and passing on the experience to others to solve the same problem. Idea from ITK or researchers.
- NIS: Intervention measures to a specific country to solve a problem; can also work in other countries with similar problems. Idea from ITK or researchers.
- New or changed things, processes of getting and sharing, structures both physical and nonphysical, rules/regulations and resources; transcends national in this globalised world.



'National Innovation Systems' is a new concept, and as such, precise definitions are still emerging. Various definitions are shown in the adjacent box, the first three of which are referred to by Arnold and Bell in their paper, *Some New Ideas about Research for Development*⁵.

Box 6. National Innovation Systems: definitions from the literature

The "set of institutions whose interaction determine the innovative performance of national firms." (Nelson and Rosenberg).

"A system of innovation is that set of distinct institutions which jointly and individually contributes to the development and diffusion of new technologies and which provides the framework within which governments form and implement policies to influence the innovation process. As such it is a system of interconnected institutions to create, store and transfer the knowledge, skills and artefacts which define new technologies." (Metcalfe) "All the actors and activities in the economy which are necessary for industrial and commercial innovation to take place and to lead to economic development." (Arnold and Bell)

"At its simplest an innovation system is the groups of organisations and individuals involved in the generation, diffusion and adaptation, and use of knowledge of socioeconomic significance, and the institutional context that governs the way these interactions and processes take place." (Hall *et al.*, 2003: 3).

"Innovation systems approaches view innovation in a more systemic, interactive and evolutionary way, whereby new products and processes are brought into economic and social use through the activities of networks of organisations mediated by various institutions and policies" (Hall *et al.*, 2004).



Figure 4. Innovation System Diagrammatic

Research generates new knowledge, or as Arnold and Bell (2001) suggest, works with and re-jigs the existing stock of knowledge; but impact is only realised when this knowledge is used. The use of new knowledge to change practice and policy within the social system is

⁵ Arnold E. and Bell M. (2001), Some New Ideas About Research for Development, in Danish Ministry of Foreign Affairs: Partnership at the Leading Edge: A Danish Vision for Knowledge, Research and Development (April 2001). Down load from

http://www.um.dk/NR/rdonlyres/7CD8C2BC-9E5B-4920-929C-D7AA978FEEB7/0/CMI_New_Ideas_R_for_D.pdf

said to give rise to innovation. Innovation in this context is not a one-off creation but relates to the scaling-up or commercialisation of technologies (i.e. ideas, hardware, & practices).

Figure 4 is a diagrammatic representation of the main players at the different levels in the national post-harvest innovation system. Figure 5 is a photograph of a similar diagram used during the workshop, against which the participants positioned their organisations. The exercise not only revealed the absence of members from sub-district levels, but also the absence of private sector players and those from other sectors.



Figure 5. Position of workshop organisations within national innovation system 'hierarchy'

Institutional learning and change

This project aims to generate and promote new ideas as to how the *national innovation system* can be better mobilised to sustain the uptake and adoption of post-harvest knowledge by poor farmers. Post-harvest here refers to harvesting, storage, processing and marketing issues.

The proposition is that institutional learning and change across the innovation system is key to improving impact, and that a *learning alliance approach* provides a means to bring this about.

A learning alliance approach requires individuals and organisations within the innovation system to form working partnerships. As a 'microcosm' of the innovation system, the learning alliance network (see box) should capture some of the 'messiness' that typically constrains working relations in different parts of the system.

It is anticipated that given collective aims and a structured, but flexible and adaptive approach,

an alliance of practitioners, researchers, policy makers and local activists, will develop broader ownership of concepts and processes, build up local capacities (particularly for adaptive management), and be better placed to develop locally appropriate and replicable innovations.

Box 7. Learning alliances

- Are groups of individuals or organisations 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 & legislation, research & learning, documentation & dissemination etc.
- Represent part of the bigger whole, and thus capture some of the organisational complexity - warts and all 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, and share responsibilities, costs and benefits.

Source includes: Moriarty et al. (2005)

As the group exercise showed (see Figure 5), alliance members are typically clustered at different administration levels (e.g. national, regional, district, community). In the literature these are referred to as *stakeholder platforms*. The challenge for PHILA is to identify and breakdown constraints to information flows and institutional learning, both across the *horizontal* relationships and between the *vertical* relationships.



Working again in pairs the workshop participants were tasked to reflect on what they had heard about learning alliances and to explore their own organisational position with respect to the following four questions, which relate to some of the basic principals associated with *learning alliances* in the literature:

1. Is there a shared understanding of the underlying post-harvest problem?

The project proposal states that:

- household food security remains precarious, with food production levels showing no or little increase;
- post harvest service provision and supporting research initiatives have focused on the development of technologies with little attention being paid to distinguishing between the needs and priorities of different households or to understanding delivery system constraints.
- 2. Are the organisation's interests in line with those of the project / PHILA?
- > What, for example, is the organisation's mission?
- 3. What capacities/capabilities would the organisation or individual bring to the project?
- 4. How might the organisation (or individual) benefit from membership of the learning alliance?

Process: The exercise was intended to provide an opportunity for participants to share and discuss in pairs their understanding of learning alliances. The written exercise was intended to record the interest of those present and establish that the mutual compatibility of the respective organisations and PHILA.

Working in pairs the participants noted down their answers to the four questions on stickers. The answers were then presented in plenary.

The participants' responses are presented in Appendix VI. All participants indicated that they agreed with the diagnosis of the underlying problem. Most also agreed that their interests were in line with those of the project and PHILA. INADES however pointed out that 'farmer recognition and participation is still low'.

All organisations moreover suggested that they could make contributions to the alliance. These were mostly in the form of providing skills and expertise (e.g. in research, training, extension, facilitation, production of publications), but also included responsibilities for policy generation (MAFS), support equipment and hardware (e.g. computers, warehouses).

Participants equally had no difficulty in identifying potential benefits for their organisations. These included new partners,

new knowledge and skills stemming from exchanges and working together, changes in working attitudes, improved performance, more efficient and sustainable solutions.

Box 8. Learning Alliance references

Arnold E. and Bell M. (2001), Some New Ideas About Research for Development, in Danish Ministry of Foreign Affairs: Partnership at the Leading Edge: A Danish Vision for Knowledge, Research and Development (April 2001). Down load from: http://www.um.dk/NR/rdonlyres/7CD8C2BC-9E5B-4920-929C-

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XII. Signing-up to the project activities

Process: This activity was intended to capitalise on the anticipated favourable response to the 'learning alliance' compatibility exercise, and to provide an opportunity for participants to indicate varying measures of commitment to the alliance and specific project activities.

Participants were invited to sign up against the project case studies, indicating whether they wanted to be informed about or involved in the case study activities. It was (and is) intended that the information be put to use either in the commissioning of the case studies and/or during their implementation.

The following tables reproduce which case studies participants expressed interests in, and the level of that interest (i.e. to be kept informed or to be involved).

Case Study 1: Analysis of the interface between post harvest public service provision and public research

Organisation	Individual	Informed-Involved
DALDO, Dodoma		informed
ZRELO	S. Tungaraza	both
TPRI	W. Mbise	both
LPRI, Mpwapwa	J. Mwanga	both
PHS	R. Mosha	both
PHMS	B. Mjawa	both

Case Study 2: Comparative analysis of how PSPs work with farmers and how FCOs work with farmers

Organisation	Individual	Informed-Involved
Local Government	C.A. Mkundi	both
FEPU, MAFS	M. Simbeye	both
INADES	P. Lameck	
TPRI	W. Mbise	both
DALDO, Kongwa	F.P. Kasanga	both
ZRELO	S. Tungaraza	both
ZFU	E. Maponde	both
PHMS	B. Mjawa	both
DALDOs; Singida, M districts	informed	

Case Study 3: District nodal studies				
Organisation	Individual	Informed-Involved		
ZRELO	S. Tungaraza	both		
PHMS	B. Mjawa	both		
TPRI	W. Mbise	both		
PADEP-Singida	D. Moshi	both		
Local Government	C.A.Mkundi	both		
FEPU, MAFS	M. Simbeye			

Case Study 4: Exploring empowerment initiatives			
Organisation	Individual	Informed-Involved	
TPRI	W. Mbise	both	
ZRELO	S. Tungaraza	both	
INADES	P. Lameck	both	
ZFU	E. Maponde	both	
UZ	Y. Chirwa	both	
DALDO, Kongwa	F.P. Kasanga	both	
Local Government	C. A. Mkundi	both	
PHMS	B. Mjawa	both	
PHS	R. Mosha	both	
FEPU, MAFS	M. Simbeye		
PADEP-Singida	D. Moshi		

Case Study 5: Household 'enquiry visits'			
Organisation	Individual	Informed-Involved	
DALDO, Kongwa	F.P. Kasanga	both	
ZFU	E. Maponde	informed	
PHS	R. Mosha	both	
Local Government	C. A. Mkundi	both	
TPRI	W. Mbise	both	
FEPU, MAFS	M. Simbeye		
LPRI, Research	J. Mwanga	both	
Central Zone			
ZRELO	S. Tungaraza	both	

Case Study 6: Farmer & extension exchange visits			
ZFU	Maponde	both	
DALDO, Kongwa	F.P. Kasanga	both	
TPRI	W. Mbise	both	
PADEP-Singida	D. Moshi		
PHMS	B. Mjawa	both	
PHS	R. Mosha	both	
Local Government	C. A. Mkundi	both	
FEPU, MAFS	M. Simbeye		
ZRELO	S. Tungaraza	both	

Case Study 7: Analysis of the interface between PSPs (including PSP) and commercial enterprises			
MAFS, Dodoma	D.R. Gasana	both	
ZRELO	S. Tungaraza	both	
TPRI	W. Mbise	both	
DALDO, Dodoma	??	Informed	
DALDO, Singida,	??		
Manyoni, Kongwa			

Communications:				
Organisation	Individual	Informed-Involved		
ZRELO	S. Tungaraza			
TPRI	W. Mbise	Informed		
		later involved		
Local Government	C. A. Mkundi	both		
FEPU, MAFS	M. Simbeye	both		
LPRI, Research	J. Mwanga	both		
Central Zone	_			
PHMS	B. Mjawa	both		
PADEP-Singida	D. F. Moshi	both		
INADES	P. Lameck	both		

XIII. Communication

Process: This session was intended to get participants thinking about the importance of communications, and in particular to identify the characteristics of and constraints to good communications, at the wider level of knowledge transfer. It was also intended to explore the best ways in which the alliance might record and share information such as

workshop reports, to optimise its usefulness to the alliance membership.

The work was mostly undertaken in groups, followed by feedback sessions and discussion.

The aggregated group work for communication characteristics is reproduced below. The table also lists characteristics that might specifically apply to a workshop report. One group elaborated their own favoured format for a *workshop report*.

Good communication characteristics (aggregated)			
General (including reports)	Workshop report		
 General (including reports) Needs to meet its objectives Relevant Uses appropriate media Cost effective Allows feedback Indicates future plans – what next? Captures the process / methodology (what, why, how) Targets group / audience – targeted for different groups/audiences Timing to follow appropriate 	 Workshop report Simple clear language Short; concise; precise; clarity Pictures, colours, illustrations Memorable Good flow Well edited Easily identified report (packaging), so can be found easily Motivating – attractive contents Effective distribution method 		
calendar so available when	➤ Testing		
requireu			

XIV. Next Steps

The management team proposed that they would develop an action plan for the way forward, with respect both to advancing the project activities and to consolidating the learning alliance. The plan would incorporate 'learning' from the three day workshop, and its components would be shared with PHILA members to effect further improvements. The participants expressed agreement with this idea,

XV. Workshop Evaluation

Amongst those expectations note down by participants on the first day, their achievement was rated as follows:

Highly achieved

- > Information on learning alliances.
- Common understanding of the post-harvest project/programme.
- > To improve post-harvest knowledge.

- To link with other key post-harvest stakeholders.
- > (And) to help try and untangle the constraints.
- To understand how to work / transform my knowledge into the project activities.
- Develop understanding of farmers' perceptions on food security and postharvest.
- > Better understanding of the project.

Fairly well achieved

- > How to coordinate various players in the field.
- Influence project to address local knowledge in post-harvest.
- Loss management.
- Reducing post-harvest crop losses
- To have documented number of farmer innovations using medicinal plants for postharvest.
- > Learn about coping mechanisms.

Not achieved

- Regional strategic plan on supply and utilisation of DEs.
- Ensuring food security to farmers.
- > Decrease in farmers post-harvest losses.



Figure 6. Mood barometer at end of workshop

Appendix I. Workshop participants and founder members of PHILA

Jina kamili/	Cheo/	Organisation	Anwani ya posta/	Namba ya simu/	Namba ya fax/	Anwani ya barua pepe/
Full name	Position		Postal address	Tel no.	Fax no.	Email address
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				+263 04 417503	+263 04	
					333880	
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		Office Mvomero				
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	Executive	Farmers Union	Zw	7	250925	
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	Officer	Dept, Post	Salaam, Tz	0748 801021		
		Harvest				
		Management				
		Services				
Concheia MKUNDI		District Executive Director	PO Box 290, Iringa, Tz	0748 481058		
Mike MORRIS	Livelihoods	NRI	Central Avenue, Chatham	0745 666749		m.j.morris@gre.ac.uk
	&		Maritime, Kent, ME4 4TB,			

	Institutions		UK			
Jina kamili/ Full name	Cheo/ Position	Organisation	Anwani ya posta/ Postal address	Namba ya simu/ Tel no.	Namba ya fax/ Fax no.	Anwani ya barua pepe/ Email address
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Appendix II. Project logical framework

Narrative Summary	Objectively Verifiable Means of Verification Indicators		Risks or Assumptions
Goal			
National and international crop-post harvest innovation systems respond more effectively to the needs of the poor.	By 2005, a replicable range of different institutional arrangements which effectively and sustainably improve access to post- harvest knowledge and/or stimulate post-harvest innovation to benefit the poor have been validate in four regions.	Project evaluation reports. Regional Coordinators' Annual Reports. CPHP Annual Reports. CPHP Review 2005. Partners' reports.	National and international crop-post harvest systems have the capacity to respond to and integrate an increased range of research outputs during and after programme completion. National and international delivery systems deliver a range of services relevant to poor people in both focus and non-focus countries. Livelihood analysis provides accurate identification of researchable constraints or opportunities that lead to poverty reduction.
Purpose			
New knowledge is generated and promoted into how national innovation systems can be mobilised to sustain uptake and adoption of CPH knowledge for the benefit of the poor	 By 2006, evidence-based strategies on how to facilitate the exchange of knowledge/information between suppliers and users documented within >2 regions, and disseminated to intermediary organisation in four regions By 2006, CPHP outputs under all five research themes demonstrate self- sustaining extension and impact on a wider scale in >2 regions each. By 2006, evidence-based insights on how research innovations can be introduced sustainably into local knowledge systems are disseminated to intermediary organisations in 4 regions. By 2006, thematic synthesis of CPHP's technical outputs are disseminated to intermediary organisations in 4 regions. By 2006, databases of partners and organisations involved in, and processes involved in management of innovation and knowledge by the CPHP are made available to intermediary organisation in 4 regions. 	 1.1 and 3.1 Second generation literature of public service providers (and alliance members), both for internal consumption (briefing notes and guidelines) and for regional consumption (advisory notes, journal articles). This will be expected to consolidate and extend original thinking found in project documents (i.e. briefing papers on: learning alliances; insights to improve the performance of PH knowledge management organisations; commercial decision making as regards grain protection; farmer PH decision making; final project report; interviews with coalition team members etc). 3.2 CPHP website 	Enabling environment exists for exploration of institutions, linkages and knowledge management within the organisations and institutions specified. Capacity - staffing levels and competencies - of coalition members, organisations maintained at least at current levels. Approved project funds are released as anticipated by the work plan on or before 1st January 2005. Political climate remains stable, no civil unrest. Any changes in current agricultural policies are favourable with respect to the project's objectives.

Narrative Summary	Objectively Verifiable Means of Verification Indicators		Risks or Assumptions
Outputs			
1. Institutional learning and change: improvements to understanding and effectiveness of learning alliances ('coalition' working – but at all levels) as agents of change, advanced .	 1.1 Formalised understanding of the successes and weaknesses of learning alliances (LAs) established through iterative review of project partnerships and institutional learning – process monitoring. 1.2 Improved communications between expanding learning alliance (LA) partners, and particularly between different 'levels' of multi-stakeholder platforms, developed over the year. 	 1.1.1 Initial (WS1) briefing paper on learning alliances. 1.1.2 WS2 proceedings: record of WS session on learning alliances. 1.1.3 Synthesis report of LA review. 1.1.4 Final briefing paper on learning alliances, and journal article. 1.2.1 Written and telephonic records of communications 1.2.2 Changes - increases - in alliance partners as recorded in PM and quarterly reports. 	Incentives (e.g. organisational & professional development; realising agent & agency aims; individual remuneration & benefits) are key to effective LAs. Risk of conflict between members due to differential in- country agency remuneration schemes (e.g. per diems <i>cf</i> fees)
2. Facilitation of in-country PH knowledge management: Practical 'insights' from current working practices developed , and improved practice recommendations generated .	 2.1 Institutional analyses of state service providers and a minimum of 4 farmer-centred organisations (FCOs) in Tanzania & Zimbabwe by mid-term workshop (July). 2.2 Interface analyses of public SPs & public research, of public SPs & vommercial' sector (e.g. agri-business) in 2 countries by mid-term WS (July). 2.3 Interface analyses of public SPs & farmers, of FCOs & farmers; and comparative analysis; for the 2 countries by mid-term WS (July). 2.4 Public SPs PHS, PHMS and Extension Services in MAFS (Tz), AREX and AETS (Zw), and FCOs in both countries, develop a better integrated (e.g. new linkages between SPs and FCOs), more responsive approach to meeting the demands of a diverse private sector (e.g. different farmer types, 'commercial' enterprises, policy makers). 2.5 Additional insights developed from exchange visits of farmers and frontline extension staff. 2.6 Review of agricultural and research policies (e.g. ASDP in Tz) against study findings. 	 2.1.1 WS2 presentation of nodal analysis of public SPs and FCOs findings and proceedings. 2.2.1 WS2 presentation of interface analyses of public SPs & public research, of public SPs & commercial' sector findings and proceedings. 2.3.1 WS2 presentation of interface analyses of public SPs & farmers, of FCOs & farmers; and comparative analysis; findings and proceedings. 2.4.1 Final briefing paper on insights to improve the performance of PH KMOs. 2.4.2 Field staff and district reports. 2.4.3 Records of FBOs on levels of cooperation with public service providers. 2.4.4 Company records. 2.5.1 Interviews with farmers and extension staff involved in the exchange. Record of insights developed presented at WS3. 2.6.1 Agricultural and research policy section of the briefing paper on insights to improve the performance of PH KMOs. 	Progressive leadership assumed, so that any institutional reluctance to adopt reforms is overcome. Organisational commitment to policy and objectives-led thinking. Funds available to maintain current staffing levels and staff training.
3. Ability of diverse private sector players – farmers and commercial enterprises – to access and utilise relevant PH information, explored and improved .	 3.1 Clusters of resource poor farmers in a number of districts identified, introduced to, and put into practice - embrace - PH information relating to a selection of PH technologies including the use of DEs. 3.2 Agri-business in at least 2 SSA countries develop plans for importation and/or mining, refining & distribution of DEs. 3.3 Work undertaken by marketing companies in Tz and Zw to establish the potential markets, commercial viability and public acceptability of DEs. 	 3.1.1 Interviews with these farmer clusters. Inspection of: farmer enquiry data collected and synthesised; briefing paper on farmer PH decision- making. 3.2.1 Interviews with these agri- business representatives. 3.2.2 Record of company business plans. 3.3.1 Study TOR and data collected. 3.3.2 Company records and 	Farmers' organisations in Zimbabwe remain essentially free from political constraint in this area. Commercial sector not subject to market failure, cartels, or dictates from exiting commercial interests (e.g. synthetic pesticide interests or lobby) - free market conditions exist.

4. Policy and implementation strategy recommendations to technology into mainline strategy recommendations to	ral Policy advisers and policy- makers not 'distracted' or
agricultural sector policy. 4.2 More inclusive approach by public sector SPs to engaging with a wider selection of farmers. Finer 'match' of PH information to targeted farmer groups; more equitable and relevant targeting; monitoring outcomes suggesting SPs are reaching the more resource-poor PH. 4.3.1 Government memoranda agricultural sector policy. 4.1.2 Inspection of policy documents and recommendations. 4.2.1 Minutes from meetings o 'new' statutory provider workin groups. 4.2.2 Minutes of FCOs' meetin 4.3.1 Government memoranda and other official documents.	exclusively taken up with multilateral donors and/or the appeal of bigger-scale initiatives and associated funds.

Activities	Activities	
1. Institutional learning and change:	3. Private sector access and utilisation of PH information	
1.1 Preparatory administration for the inception workshop.	3.0 Interface analysis under output 2 involve triangulation interviews	
1.2 Draft & circulate briefing paper on 'learning alliances' for inception WS.	with commercial sector. 3.1 Commissioning and training for systematic PH household study.	
1.3 Holding inception workshop (DSM-Morogoro-Dodoma?) in mid- late Feb, and reporting of WS sessions.	3.2 Use of enquiry tool with HHs in study villages in the 2 districts; initial and repeat visits.	
1.4 Review performance of 'learning alliance' between WS1 & WS2.	3.3 Methodological development, draft TOR and commissioning of	
1.5 Preparatory administration for the 2nd 'learning alliance'	'people' focused programmes (e.g. HIV/AIDS and PHC programmes).	
workshop.	3.4 Implement people focused study; report and circulate study and findings.	
/ early July, and reporting of WS sessions.	3.5 Farmer & front line extn staff exchange visits.	
1.7 Synthesis of learning on 'learning alliance' produced between	3.6 Analysis of enquiry visit findings.	
WS2 & final WS.	3.7 Synthesis report and briefing paper on farmer PH decision-	
1.8 Preparatory administration for the 3rd 'learning alliance' workshop.	making, based on enquiry work, 'people' focused study, and exchange visits produced and circulated	
 Holding final workshop (DSM-Morogoro-Dodoma?) in early December, and reporting of WS sessions. 	3.8 Review of briefing paper at session of final workshop.	
1.10 Production of paper on: 'Learning alliances: institutional learning		
2. Improving performance of in-country KMOs:	4. Generation & promotion of policy recommendations	
 Commission, draft and circulate briefing paper on institutional analysis. 	4.1 Literature reviews on PH policy experience, advice and formulation, both generally and specific to the region/s.	
 2.2 Scoping exercise to consolidate selection criteria and choice of study districts. 	4.2 Short synthesis report based on literature reviews and main findings (synthesis reports) from outputs 1, 2 and 3, produced by core	
2.3 Methodological development, draft TOR and commission studies.	team prior to final workshop.	
2.4 Implement 'nodal' analyses of SPs, report study and findings.	4.3 Review of synthesis report by alliance at session of final workshop, and initial policy recommendations generated	
2.5 Implement interface analyses of SPs and PSR, and of SPs and	4.5 Sets of policy recommendations refined by core team.	
2.6 Implement interface (and comparative) analyses of public SPs &	4.6 Promotional meeting for key national agricultural innovation	
farmers, and of FCOs and farmers; report study and findings.	system players.	
2.7 Review of study findings by alliance at workshop.	4.7 Promotional activities based on the learning alliance approach but with practical potential at district and community levels (e.g. farmer	
2.8 Identify, commission and implement further study of researchable constraints, gaps identified; report study and findings.	PH networking, forums for farmers to evaluate service delivery, 'competitions' to engage schools and students, participatory video).	
Produce synthesis of component studies and briefing paper; circulate to alliance members.	4.8 Production of project final report.	
2.10 Review of briefing paper at session of final workshop.		

Appendix III. Workshop programme

Day 1: Tuesday 15th March 2005

Time	Activity
0900	Registration
0930	Official opening – Assistant Director of Plant Health Services
0945	Self introductions/Workshop Expectations
1000	Background to the project background
1010	Introduction to the project broad workshop objective
1030	Tea break (30 mins)
1100	Shaping of outputs 2 and 3 and respective activities
1315	Lunch (1 hour)
1415	Plenary presentations by groups
1615	Tea break (30 mins)
1645	Plenary presentations by groups
1700	End of day 1 followed by logistics etc

Day 2: Wednesday 16th March 2005

Time	Activity
0800	Plenary presentations by groups
0900	Experiences on post-harvest service provision from different stakeholder perspectives
	e.g. NGO, Public Extension, Private Agro Inputs, Public Research etc
1100	Tea (30 mins)
1115	Selection criteria and location of study sites for the case studies of different service
	providers
1215	To share/ explore understandings of:
	(a) Institutional analysis, post-harvest policy advice, formulation and
	implementation (Group 1)
	(b) Farmer-related activities - post-harvest enquiry framework, exchange visits and
	'people-focused' programmes (Group 2)
1315	Lunch (1 hour)
1415	To share/ explore understandings of (continued):
	(c) Institutional analysis, post-harvest policy advice, formulation and
	implementation (Group 1)
	(d) Farmer-related activities - post-harvest enquiry framework, exchange visits and
	'people-focused' programmes (Group 2)
1500	Tea (30 mins)
1530	Plenary presentations by groups
1700	End of Day 2

Day 3: Thursday 17th March 2005

Time	Activity
0900	Learning alliances
1130	Tea (30 mins)
1145	Learning alliances
1245	Communication and Reporting
1315	Lunch (1 hour)
1400	Communication and Reporting (Continued)
1500	Tea Break
1515	Process issues
1600	Plenary presentations by groups
1630	Develop Action Plan
1700	Workshop evaluation
1730	Plenary presentations by groups
1800	Closing remarks and end of Workshop 1

Appendix IV. Promotion of Crop Protection strategies

Experiences of promotion crop protection strategies, Central Zone; Judicate Mwanga, Socio-economics Department, LPRI, Mpwapwa.

Central zone research is mandated to work in the nine districts of Dodoma and Singida regions, catering for both livestock and crop research. Crop protection is of high priority in this semiarid central zone. Research is not confined to postharvest aspects but addresses both pre- and post-harvest problems. The zone unfortunately lacks capacity in areas of plant patholology and entomology, and so 'borrows' the required expertise from Eastern zone - the Ilonga Research Center.

There have been four main programmes taking place since 1995. These have focused on management, smut control, crop protection strategies and promotion, and the final one, the FAO 'Links project', which focuses on ITK in seed management. The previous three projects were supported by the Crop Protection Programme (CPP) and the Natural Resources Institute (NRI), and funded by DFID.

The major crop covered were maize, sorghum, pearl millet, tomatoes and onion, all of which are key crops in the zone. This paper intends to share experience accrued from the four projects and provide insight on crop protection, communication and PM&E.

1. Status of post-harvest losses

Post harvest losses in central zone range between 30 to 40%. The zone is prone to erratic rainfall hence magnifying farmers' food insecurity. Countering pre- and post-harvest losses revolves around four major themes:

- Pest and diseases management
- Harvesting technology and quality control
- Storage and marketing
- De-husking/dehulling and processing (value adding).

2. Main causes of post harvest crop losses

 Fungal (e.g. moulds as a result of inadequate drying; smuts, especially covered kernel smut(CKS)). On the other hand fungal infection results into aflatoxin contamination

- Pre- and post storage pests, namely Prostephanus truncatus, Tribolium confusum and Sitophilus spp. Prostephanus starts right from the grain fields. Root nematode (Meloidogyne spp) is still new to tomato farmers and result in insurmountable losses, while onion termite is becoming menacing for onion based farming system.
- Noxious weed (e.g. striga in sorghum, maize and upland paddy).
- Birds (quelea quelea, love birds).
- Domestic animals.
- Wild animals.
- Milling loses due to poor grain characteristic (e.g. some rice varieties)
- Inefficient machinery.
- Inappropriate drying facilities hence reduction in quality
- 3. Mitigation against post harvest losses
- Application of IPM.
- Application of ethno-botanicals and other locally available ITK (see Table 1).
- Application of pre- and post-harvest insecticide at minimal level to safeguard environment and consumer health.
- Timely harvesting after physiological maturity.
- Grading.
- Sorting.
- Drying (cost effective solar drier technology) to control moisture.
- Parboiling in case of rice.
- Proper de-hulling e.g. use of rubber rollers de huller for rice and sorghum.
- Value-adding as a marketing strategy.

In seed treatment, farmers are using powder soap (Omo) against sumt (CKS) while others are using kerosene. Kerosine is effective not only to CKS but also to storage pests.

3.1 Ethno-botanicals indicated by farmers from central zone

There is wealth of untapped local knowledge on the field of ethno botanicals. Farmer are using wide range of methods in controlling post harvest losses Table 1.1 below. Others includes (MSIGITI)= solar drying by hanging the cobs on the wooden stuff, air tight containers e.g. mammoth-gourds, plastic containers and smoking.

4. Crop Protection Programme (CPP) strategies against pest, diseases and weeds

CPP, with support from NRI is promoting a number of crop protection information communication tools, methods and approaches through all available pathways.

4.1 CP information and technology communication tools

- Leaflets with various CP themes
- Posters with various CP themes
- Participatorily prepared Radio programs (KILIMO CHETU) with various CP themes and broadcasted by RTD Kanda ya Kati
- Participatorily prepared Video shows
- Notice boards displays
- Participatory monitoring and evaluation of various communication tools and CPtechnologies

4.2 CP Information communication methods

- Community demo plots using pre and post harvest insecticides both local and industrial
- Farmers experimentation on various pesticides both local and industrial
- Farmers seminars on CP and proper handling of agrochemicals
- Training sessions couple wit hand outs
- Farmers field days
- Infor-tainment (drama troupes)

4.3 CP information communication pathways

- Farmer groups
- Primary school pupils passing information to parents and other pupils

- Front line formal extension staff
- Nodal and innovative farmer groups
- QDS farmers
- Visiting researchers
- CBO/NGOs and farmers net works e.g. INADES formation
- 4.4 Achievements

Assessment of communication tool indicated success of the tools and methods on three main learning areas:

- Awareness creation
- In-depth learning
- Clarification and adaptation of CP information and technologies to farmers' local environment (see Table 2).
- 5. What else can be do to enhance uptake of CP technologies?
- Add value to low-value, low-seed volume crops such as sorghum and millet. This can be achieved trough introduction of dehulling machines and promotion different recipes.
- Non-farmer stakeholders cultivate interest and strong will in understanding indigenous knowledge and local varieties.
- Empower farmers to experiment, verify and patent their innovative local knowledge.
- Collaborate with existing research institutions in further studies and promotion of local knowledge in agro-biodiversity and innovative crop protection technologies.

Table 1. Selected ethno botanicals and their uses/effects in semi-arid central Tanzania

Batanical/technology	Ethnicity source	Part used	Uses and effects (general)
Mlenda	Gogo	Root juice	Eye ointment for men and livestock (why not for moulds?)
Mtungulu	Nyaturu	Dry leaf power	Post harvest storage for cereals
Mtumba	Gogo	Dry leaf power	Post harvest storage for cereals
Mtugutu	Nyaturu	Dry leaf power	Post harvest storage for cereals
Maumbasi		Dry leaf power	Post harvest storage for cereals
Mfwaghwa njou	Nyaturu	Dry leaf power	Post harvest storage for cereals
Cow peas	Gogo/Nyaturu	Root juice	Treatment for boils (what is that active ingredient)
Neem tree (mwarobaini)	Gogo/Nyaturu	Leaf juice	Treatment for respiratory diseases in chicken
Minyaa	Gogo	Leaf juice	Treatment for respiratory diseases in chicken
	_		(Can it be used as an anti-fungal?)
Mlegea	Nyaturu	Leaf juice	Treatment for respiratory diseases in chicken
Pearl millet	Gogo/Nyaturu	Root exudates	Treatment for: malaria, removal of retained
		(juice)	placenta, can initiate labour in human being and

			cattle. (What is the active ingredient?)
Red sweet potato	Nyaturu	Tubers	Negative effect (enhance uterine pains and prolongs menstrual periods in women).
Ashes especially from (goat droppings) and sisal	Nyaturu	Ashes (inert material)	Used against weevils e.g. LGB, cut worms, stem borers.
Cooking Oil	Gogo	Smears	By smearing the grain and or the packages material oil is effective against storage pests.
Sunflower	Unanimous	Husks	Husk has repellent characteristics against grain storage pests (what is the active ingredient?).

Source: FAO LinKS Survey data in Mwanga *et al* 2003:

Table 2. Role of tools in the communication process.

Tool	Awareness	Detailed learning	Clarification -adaptation
Leaflets	X	XX	
Poster	XX	X	
Seminar		XXX	XXX
training			
Demos	X	XXX	XXX
Radio	XXXX	X	
Video	XXX	XX	
Field days	X	X	XXX
Notice	XX	X	
board			
Note books		XX	XX
Key:		XXXX	
	= no	= major	
	contribution	contribution	

Based on farmer assessments of how each tool was used to gain agricultural knowledge during participation in group activities.

Appendix V. INADES (IFTz) Presentation

INADES Formation Tanzania (IFTz): activities and experiences on PH issues; Patrick G. M. Lameck, Trainer.

INADES Formation Tanzania (IFTz) is an autonomous, not-for-profit, NGO affiliated to the network of INADES-Formation International.

INADES' aim is to work for socio-economic advancement of rural populations (youth, women and men). We envisage a society where equitable relations prevail between men and women and they are structured and really empowered to transform the societies in which they live.

Its vision is of a socio-political situation whereby smallholder farmers (women and men) are organised and possess a genuine power to:

- Control their natural resources and channels of distribution of their produce.
- Become a negotiation power capable of proposing a sound policy in order to influence and develop national policies concerning their own development.
- Be recognised and respected as farmers.
- Understand and implement the concept of gender and development so as to reduce gender imbalances in their societies.
- Take preventive measures to control the spread of HIV/AIDS in their societies.

Its mission is to seek to support, through Action-Research-Training, farmers' knowledge, actions and initiatives in:

- Managing sustainable their natural resources and marketing their produce.
- Building capacity of FOs in negotiation and advocacy ability.
- Increasing farmers' income, savings and credit facilities.
- Catalysing FOs own development process, especially through networking.
- Promoting awareness on HIV/AIDS and other health issues.

INADES' Field of Interventions include:

- Farmer organisation and farmer leaders training.
- Farmer networking from regional to national level.
- Communication, negotiation, advocacy, and lobbying.
- Land and water conservation and management.
- Marketing and economic processes (including Savings and credit).
- Crop production and animal husbandry.

- Farmers' indigenous knowledge.
- Gender.
- Income generating economic activities.

The Promoting Farmer Indigenous Knowledge (PFIK) Training programme:

- Developed with farmers Promoting Farmer local innovations Training programme.
- We work with volunteered farmer groups who have been forming Networks for joint effort
- Aim of the programme is Collect, Share, verify, document and disseminate farmer indegenous/local knowledge on crop storage, control of crop pest and diseases, animal health as well as human health.

Activities under the programme:

- Visit and identify farmers with IK
- Invite and familiarized farmers with IK as well as sensitise them to form groups.
- Farmer then display their IKs in a sharing group and network shows through workshops and exchange visits.
- IKs are then distributed to volunteering farmers to test the displayed IKs at least for one year
- Convene a feedback workshop where performance of the IKs are reported.
- Promising IKs are then documented with farmers in a technical notes

Achievements include:

- Produced 7 technical notes on IK in kiswahili, the farmer language
- Farmer reported reduced running costs in crop protection, animal health as well as human health.
- Framers with IK are resource person to various occasions such as agriculture shows Nane nane.
- Provide a reference and reaearch areas to researchers and other stakeholders.

Limitations/challenges and constraints include:

- The botanicals are limited in number and some are found in specific ecological zones.
- Some farmers with IK are not willing to share their experiences to command monopoly (source of income)
- A very slow pace by researchers to validate the IKs (Probably due to lack of mechanism, policy support, resources and mind set).

Appendix VI. Organisational (and Individual) compatibility with PHILA

Please would participants revisit and where necessary upgrade these entries, making sure that the entries are differentiated between the pairs.

Organisation/s (Work done in pairs)	1. Is there a shared understanding of the underlying post-harvest problem?	2. Are the organisation's interests in line with those of the project? Mission statement?	3. What capacities/capabilities would the organisation or individual bring to the project?	4. How might the organisation (or individual) benefit from membership of the learning alliance?
MAFS (Extension & Plant Health Services)	Yes	Yes	 Research and Methodology Development (MAFS) Innovation, promotion and dissemination Financing Training Policy & regulations Human capital 	 Exploration of demand Informed decision making Appropriate policies and regulations Sustainable systems
MAFS (PHS) & Local Government (Dodoma rural)	Yes Available evidence Personl experience	Yes Vision 2025 (MAFS & LG) Strategic plans Policy (Agric policy)	Human resource supportive infrastructure soft (info) hard (office etc, transport)	 New Knowledge new practices and methodologies networking – new partners improved service delivery a tool for decision making (project outputs)
INADES & University of Zimbabwe	Yes Research initiatives are not concerned with uptake of technologies	INADES: Yes – but farmer recognition and participation is still low UZ agree with but also lack of concern with uptake	 Farmer empowerment & organisation Farmer knowledge and experiences database Action learning approaches UZ Literature/ computer, analytical skills, experience of farmers practices and organisations 	 Gain competencies outside those INADES currently has Other experiences Shared resources Alliances lessons and experienced Multidisciplinary approach/ team work for effectives Opportunity for lobbying and advocacy UZ Advocacy New knowledge Specialised skills/ human resources, experiences in working with communities
ZFU	Yes	To enable farmers to attain sustainable food security Need holistic approaches (LAs) to all S & U of innovations, e.g. food security	ZFU Economist Extensionists Policy makers Warehouses	Identification of areas of weaknesses for improvement Improvement on information dissemination Exchange of literature
TPRI	Yes – with experience in handling RFSA issues for districts in past	Yes – institute deals with food security issues to enable end users/ farmers to have	PH research scientists and other staff Labs to analyse samples & equipment Can handle environmental &	Identification of areas of weaknesses for improvement Improvement on information dissemination Exchange of literature

		sustainable food security	health risk assessment issues Experience with internal organisation funding to handle such issues e.g. work with CIMMYT, IAEC/FAO, IDRC projects	Exchange of information
UZ & PHS (PPO Central Zone)	Yes - Satisfying HH food security a big challenge -Diversity of HH neglected in the past -Previous interventions technology focused at the expense of delivery systems	Yes -both PH research should have impact -service provider regulatory	 PH skills Research, Extension & Training Training at all levels (village to tertiary) 	Professional devt capacity building in innovative approaches Institutional recognition (fame) Ability to work with diverse stakeholders
SUA	Shared understanding of the problem	(public service, teaching and extension) To help rural communities help themselves	 Organisation capacities/ capabilities Experienced staff with access to others doing similar work Physical space Support staff time off to enable them to do the work Individual capabilities Experience of groups, adoption studies, needs assessments, surveys, impact, evaluation Farmer & extension training Facilitates Res-Ext-Farmer forum (EZCO) Participated in the formulation team of the ASSP which has a similar philosophy 	New insights, learning which improves teaching and sharpens research skills Contacts (inst & individ) System becomes more solid by building on the strengths of the LA members
Extension	Agreed	The organisation interests are in line as the daily activities intend to facilitate communities in a participatory way to increase production & reduce food shortage	 Commitments Information PRA methodologies Human resources 	 Proper use of resources Learning from others Capacity building Improve work efficiency
MAFS (Pub) & LG (Kongwa)	Yes	Yes as we deal with household food security	 Linkage and publications 	 Sharing with different stakeholders in solving problems Dissemination of informations Solutions sustainability Empowerment to farmers
MAFS & ZRELO	Yes – we share	Yes Our main aim is to reduce PH losses that lead to decreased HH food security	Strong and committed team of experts to offer knowledge Path down to farmers through LGAs in technical issues is open (no bureaucracy) Link with all stakeholder is open (NGOs, farmers, researchers)	Change in working attitude as organisation (Esp research) uptake of innovation by farmers Demands known by suppliers through efficient feedback Are able to make decisions and provide human resources as well as financial in some activities Enhanced canacities to advise at

				concerned level
NRI	Yes	Yes and we are represented here by members from the food security group and the livelihoods and institutions group	Staff experienced in: PH aspects of rural livelihoods in SSA; service provision; working in diverse teams; facilitation experience; access to other similar work; access to information useful for developing the case study and LA methodologies; help developing linked proposals and winning support; widespread contacts; committed and interested individuals.	Increased first hand experience; wider understanding; more links to key players; opportunity to continue learning.