CROP POST HARVEST PROGRAMME

Improving household food security by widening the access of small-holder farmers to appropriate grain store pest management

R8265 (ZB 0335)

PROJECT FINAL REPORT

1 January 2003 – 31 December 2004

CAPSARD, CARD, OICT, Ministry of Food and Agriculture, Natural Resources Institute, University of Development Studies

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Project Final Report

Section A

Executive summary

The Crop Post Harvest Programme's (CPHP's) objectives in commissioning the 'farm storage project[1]' were to effect improvements in the household food security of smallholder farmers in northern Ghana (project purpose), and ultimately to contribute to making national and regional crop-post harvest innovation systems more responsive to the needs of the poor (project goal). These aims mirror the Ministry of Food and Agriculture's (MoFA's) current mission statement, which includes "...addressing the specific needs of farmers, especially the rural poor, in an effort to reduce poverty". They are also in keeping with the focus of MoFA's new agricultural extension policy, which is "…to ensure equity in the distribution of the benefits from development; to improve rural livelihoods; and to reduce poverty"[2] (MoFA, 2002).

The project was intended to increase the impact of previous CPHP research findings on grain-store pest management options by improving their accessibility to farmers. The earlier body of CPHP research focused on developing technical solutions to specific pest/crop-related problems, and paid less attention to distinguishing between the needs and priorities of different farmers, or to understanding delivery system constraints. Either or both of which could - and do - undermine the developmental impact of good science. Both CPHP, and in principle, MoFA, now support the idea that extension services should be more demand-led and client-focused (MoFA, 2002). Post-harvest (and other) extension service provision however does not as yet significantly embody these principles.

To rise to these challenges, the project was designed and implemented by a coalition of public (MoFA) and voluntary sector (CAPSARD, CARD, OICT) extension service providers with PH interests, plus a public sector research agency (UDS), with external UK advisors (NRI) providing continuity and additional technical facilitation. The initial proposition was for the coalition to devise a 'decision support tool' which would facilitate and improve farmers' choice of appropriate storage methods from a range of existing options.

The key 'technical output' of the project is an approach to working with farmers, the diversity response approach (DRA), and a mechanism, the 'responsiveness tool-box' (RTB), which brings together the approach and a set of participatory and technical tools. Used as an awareness raising and training tool, the RTB will facilitate the understanding and capability of key PH knowledge managers, and provide a means of responding to the needs of diverse households by composition, livelihood or wealth status, and of individuals by sex and other identities (e.g. age, disability). Plans for the promotion of the uptake of the DRA and sustaining on-going development and deployment of the RTB (i.e. mainlining these within the existing PH innovation system) include: engagement with the FARMER Project (CIDA/MoFA funded), which is considering using the Coalition to run six courses on this in the three regions of northern Ghana in 2005; the production of the project memorandum *Learning from Farmers: The post-harvest tool-box approach*, as invited by CPHP; and general mainlining of project dissemination outputs amongst key PH stakeholders, particularly MoFA.

This report documents and elaborates the processes and learning associated with the above, and the detailed research activities, including the switch from an earlier technical focus to a broader farmer-centred or livelihoods approach. We strongly believe that the project outputs, with further support from CPHP, can provide a crucial contribution to the 'missing' implementation strategies needed by MoFA to realise many of their (PH) agricultural extension policy objectives.

[1] The full name of the project is: 'Improving household food security by widening the access of small-holder farmers to appropriate grain store pest management'.

[2] "..especially among rural woman, the youth and the physically challenged" (MoFA, 2002).

Section B Background

B.1 Administrative data

NRIL Contract Number: B0335	Managing Partner(s)/Institution(s): Ministry of Food and Agriculture
DFID Contract Number: R8265	Partner institution(s): Natural Resources Institute (UK), CAPSARD, OICT, CARD, UDS
Project Title: Improving household food security by widening the access of small-holder farmers to appropriate grain store pest management	Target Institution(s) *At national and regional levels*: policy makers; politicians; those involved in PH knowledge management (i.e. state, voluntary & private sector service providers, and aligned researchers); organisations and networks representing farmers' interests. *Internationally*: research policy makers responsible for designing innovation & knowledge management processes
Research Programme: Crop Post-Harvest	Start Date: 1 January 2003 End Date: 31 December 2004
Thematic area: Minimising the use of insecticides	Budget (i.e. Total Cost): £154,257

Section C Identification and design stage (3 pages)

Poverty focus

Please describe the importance of the livelihood constraint(s) that the project sought to address and specify how and why this was identified.

The livelihoods of most rural people in northern Ghana are closely linked to their ability to grow, store and/or sell key food crops. Household food security relies on the production of sufficient food crops to see people through the 'hungry' period from February to July or until the next harvest. In certain years some households will produce a surplus to their own requirements, which they may store and/or sell to bolster their living. Many others however will fail to produce sufficient for household consumption to last throughout the storage season, and be forced to adopt coping strategies.

Moreover, the unpredictable nature of the climate in northern Ghana and poor agro-ecological conditions ensure that these diverse livelihood patterns are in a state of flux. For some households 'accumulation' strategies in a good year may be followed by 'coping' strategies in a bad year; poorer households over the same period may move from 'coping' to 'survival' strategies. Downward changes to household livelihood strategies are undertaken in a predictable and logical sequence, starting with easily reversible activities that do not erode the asset base (e.g. reduced meal frequency), progressing through more erosive strategies (e.g. sale of land or livestock), and *in extremis* forced migration. Even when poor and middle strata households adopt similar coping mechanisms, depletion of poorer households' limited resources leaves them more vulnerable to future downturns.

In all cases however, food security would be enhanced if households could maintain their stored food crops – grains, roots or legumes – free from insect infestation and other damage. Preserving quality during storage is also linked to better sale prices, not only in terms of associated premiums but also because it enables (some) farmers to avoid selling early when market prices are low.

In northern Ghana, survey work had revealed storage problems for both maize and cowpea, with many households either not taking remedial measures or adopting ineffective ones

(Brice *et al.*, 1996: Golob *et al.*, 1998), and post-harvest storage losses due to pests and diseases were subsequently estimated to range from 30% for grain crops (CIDA, 1999). In 2001 in its *Food and Agriculture Sector Development Programme Report* the Ministry of Food and Agriculture (MoFA) stated that food grain storage is an important priority for Ghanaian agriculture. The project built on this emerging consensus that wider understanding and adoption of improved, cost-effective grain storage methods would reduce the vulnerability of many households and/or individuals.

How did the project aim to contribute to poverty reduction? Was it enabling, inclusive or focussed (see definitions below[3])? What aspects of poverty were targeted, and for which groups?

The specified aim of the project was to promote a range of grain protection options and hygiene measures to improve household food security. These would be based predominantly on the technologies developed by previous CPHP projects, which were to be tailored to the circumstances of individual households using a decision-support tool that the project would develop. By one analysis rural communities in northern Ghana are amongst the poorest in the country[4], and as such this provision of post-harvest information could be argued - as we did in the project memorandum - to have an 'enabling' poverty focus.

The project has since however further explored aspects of household diversity within and between rural communities, and we would now argue that the project poverty focus is better described as 'inclusive'. While rural communities in the north are considered to be generally impoverished, we have found nonetheless that a number of households in any community are significantly (i.e. quantitatively and qualitatively) worse off. Switching from an essentially technology-driven approach (i.e. promoting existing technologies) to a people-centred or livelihoods approach (i.e. assessing different households' resources, needs and priorities, and responding accordingly) has had the profound effect of necessitating a more equitable or 'inclusive' approach to post-harvest service provision (see Figure 1).

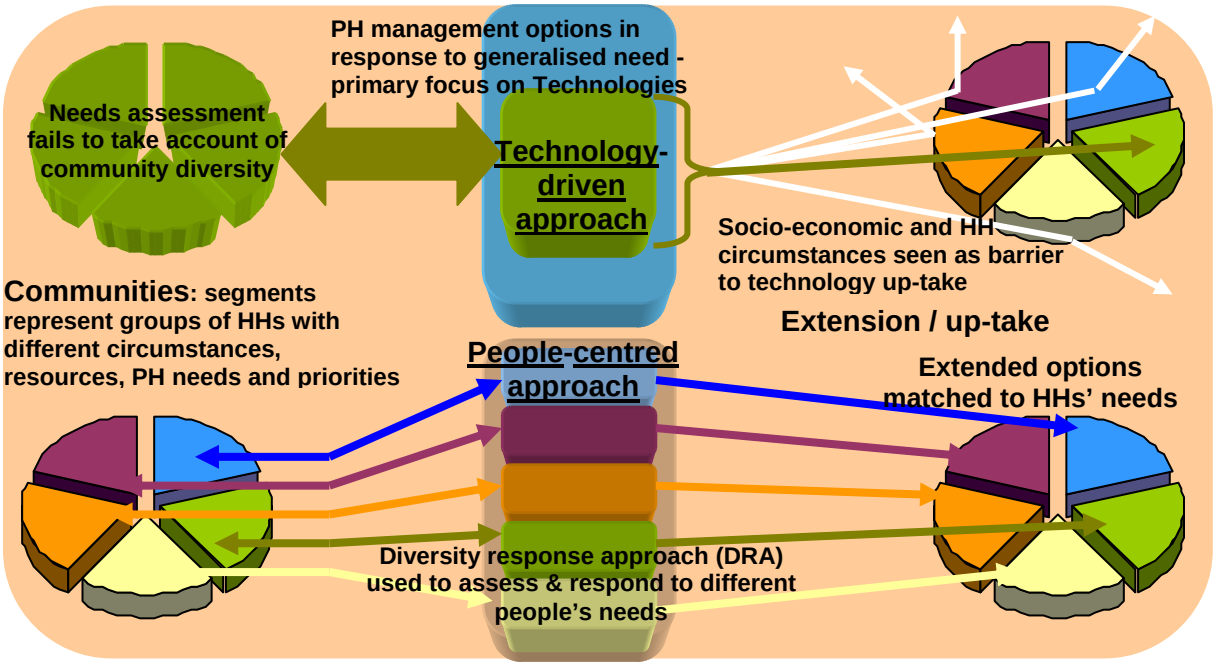
Many existing PH technologies, most of which had been developed following needs assessment exercises, were found not to fit with or meet the priorities of all household strata. Moreover their extension by MoFA and voluntary sector agencies had usually involved the use of 'contact' or progressive farmers (the same types of farmers contacted during needs assessment exercises?), whose resource bases, needs and priorities are typically significantly different from those of poorer households. Discovery that the existing portfolio of storage technologies may be inappropriate for many poorer households, that extension services were failing to take account of their particular circumstances, and cognisant of the focus of MoFA's new agricultural extension policy which is '*to ensure equity in the distribution of benefits from development; to improve rural livelihoods; and to reduce poverty*' (MoFA, 2002), prompted a rethink by the Coalition. And a more responsive, inclusive, and therefore equitable approach to the delivery of PH information - applicable also to crop and livestock extension - has been developed.

This approach, which we are calling a *diversity response approach* (DRA), has included significant progress on the development of a 'tool-box' and 'training' module for key extension staff that will provide the means of responding to the needs of diverse households by composition, livelihood or wealth status, and of individuals by sex and other identities (e.g. age, disability).

[3] **Enabling**: addresses an issue that under-pins pro-poor economic growth or other policies for poverty reduction which leads to social, environmental and economic benefits for poor people
Inclusive: addresses an issue that affects both rich and poor, but from which the poor will benefit equally
Focussed: addresses an issue that directly affects the rights, interests and needs of poor people primarily

[4] Ghana's PRSP indicates that food subsistence farmers in northern Ghana suffer the highest rate of poverty (IDA and IMF, 2002).

Figure 1. Initial technology-driven approach versus people-centred approach



How and to what extent did the project understand and work with different groups of end users? Describe the design for adoption of project outputs by the user partners?

At the initial design stage the project's understanding of potential end-users was informed by existing empirical studies from northern Ghana, by other studies from comparable parts of sub-Saharan Africa, and by the respective experiences of coalition members. While however there was a general appreciation of the diversity of rural communities, as presented in the project memorandum, the mid-term review of research activities undertaken with farmers by different coalition partners, revealed a pervasive skew in the selection and participation of farmers and farming households. The vast majority of participants, for various reasons, were from less poor households, and women farmers were very poorly represented (Dissemination output 2, listed in Annex 3).

Although a very poor harvest across the study areas in 2003 and the limited applicability of the technologies were in part responsible for the skewed representation, it was also apparent that in-country partners and their respective field staff[5] were lacking the means (e.g. know-how, resources for training & implementation, organisational imperative, motivation etc.) to effectively address these matters, and that not all were convinced by the poverty imperative or of the need to address gender issues. This prompted a significant debate and re-evaluation of the project, which culminated in revisions (of sorts[6]) to the design.

To better discern which end-users the project should work with and establish how this was to be done, an additional workshop was programmed, at which the adoption of an inclusive

[5] Virtually all the coalition members and extension staff in both MoFA and the NGOs are male, and the project only once succeeded in securing the attendance of a representative from WIAD (women in agricultural development), MoFA's gender extension advisory service.

[6] Revisions were perhaps equally as much about re-establishing and consolidating a common understanding of the project memorandum and logframe and re-aligning the implementation of the project with that plan, as about changing the original design.

approach to household and intra-household diversity was agreed. This was however to exclude the wealthiest households, typically a small minority of any community, who were deemed well capable of independently articulating and securing their PH needs. In reaching this decision, current extension practices and MoFA extension policy were critically examined, organisational mandates and mission statements explored, and the challenges associated with process over task orientation considered (Dissemination output 10).

In addition to the coalition partners, the project envisaged mainlining MoFA's extension personnel in the processes associated with realising the outputs. When regrettably this faltered the review process picked it up, and most recently the Regional Director's assistance has been sought to consolidate the mainlining process. It was also anticipated that the scaling-up of the project findings to include other districts in Northern Region and those of Upper East and Upper West, in line with the current decentralisation initiative, would be realised through the District Directors of Agriculture (DDAs) and others (e.g. district assemblymen, NGO staff), requesting training inputs. Latterly a funding proposal has been submitted to the FARMER project to facilitate the training of key extension staff at workshops in the 3 northern regions, and considerable energy was put into the concept note and subsequent project memorandum for a follow-up project, to ensure that value-adding and scaling-up was optimised. In addition to this, key intermediary stakeholders were to be and have been identified and promotional activities have been initiated.

Institutional design

Describe the process of forming the coalition partnership from the design stage and its evolution during the project?

Period	Activity/Process	People involved
April 2002	a. Thematic workshop in Accra to prioritise various project work themes and to select 4 project areas to be involved in the next stage of CPHP work b. CPHP criteria of poverty, project ownership, institutional management c. Learning about the new innovation of CPHP, the idea of coalition formation as outlined in the CPHP Starter Pack 2002	Dr Ben Dadzie (West Africa CPHP Co-ordinator) and Dr Andy Hall (facilitator), managers and members of existing CPHP projects.
Sept – Dec 2002	a. Development of short concept notes by selected thematic areas b. Development of concept note into project memorandum c. Inviting comments on PM and people/organisations to form coalition	Rick Hodges and Mike Morris (NRI, UK) Samuel Addo and Fuseini Haruna Andan (MoFA, Ghana)
Feb 2003 Project inception workshop	a. Plan activities for the 2-year project b. Select management team c. Assign activities to various organisations/people	NRI, MoFA, CARD, CAPSARD, OICT, University of Development Studies, Tamale
Institutional Workshop – Accra		Dr Andrew Barnet, Dr Ben Dadzie and representatives of all projects
March 2002 – Monthly and Quarterly meetings to	a. Report on level of project activities b. Update work schedule c. Draw plans for next month/quarter	Coalition members
March 2004 Review workshop	a. To review project activities against their original plans b. To identify issues and opportunities relevant to the promotion of storage technologies c. To improve 'process' between project storage stakeholders, and in particular to strengthen and enhance the working of the Coalition	Coalition members, District Directors of Agriculture, Field staff of MoFA and coalition NGOs, Farmers
Sept 2004 CN development	A CN for a one year project, based on the diversity response approach, developed by extended communication.	Social and Technical advisors and the Project

		Leader and Technical Co-ordinators, with feedback from other coalition members.
June 2004 Diversity workshop	a. to concretise the concept of, and need for, 'responsiveness' amongst PH extension service providers, with coalition members and field staff, and b. to initiate the identification of practical ways to explore farmer diversity.	Coalition members, District Directors of Agriculture, Field staff of MoFA and coalition NGOs, Farmers
Sept 2004 Diversity training		Coalition members, District Directors of Agriculture, Field staff of MoFA and coalition NGOs, Farmers
Nov 2004 Evaluation workshop	a. To provide individuals with the opportunity to identify the strengths and weaknesses of the project b. To initiate the development of a project memorandum for a further year's work to extend the diversity response approach, taking into account the strengths and weaknesses identified in the working of the Coalition, and extend linkages to other programmes e.g FARMER Project. c. To initiate the preparation of a Project Final Report	Coalition members
Dec 2004 PM development	PM outline first developed in the Nov Evaluation Workshop, developed further by extended communication.	Social and Technical advisors and the Project Leader and Technical Co-ordinators, with feedback from other coalition members.

Is there an explicit institutional hypothesis? If yes, is it trying to attack a failure or inadequacy in a mechanism?

There was no initial explicit institutional hypothesis. As above, the adoption by the project team of a 'coalition approach' was in response to its promotion by CPHP. The first written in-house reference to an institutional hypothesis – albeit that term was not itself used – was made in a report by the social development advisor (Dissemination output 6) following a visit to Tamale in June 2003. The report restates the view first promulgated by CPHP that coalitions are systems for generating innovation, and elaborates the coalition approach as characterised by a '*managing partner*' and ordinary '*partners*'.

Based on the contributions made to the *project inception report* and to subsequent quarterly reports it would seem fair to say that there was no clear and/or shared understanding of the word 'institution' or associated terms, amongst coalition members at this time. The role and potential of coalition working to contribute to the promotion of improved storage options was however understood (i.e. members related more readily to 'practice' rather than to the 'concept' or associated hypothesis). And by March 2004 the need 'to strengthen and enhance the working of the Coalition' was identified and put forward by members as an objective of the mid-term review workshop (Dissemination output 2).

Institutional issues and/or opportunities explicitly identified at the review workshop as needing to be addressed included:

- Building on 'good practice' already existing between organisational stakeholders (e.g. OICT/MoFA 'model' for sharing and developing training materials);
- Project to emphasise its potential to help MoFA deliver against its mandate (see following paragraph) – mainlining positive aspects but avoiding negative aspects;
- Need for the Post-Harvest Unit (i.e. the management team) to ensure that the project mainlined MoFA in the technology promotion rather than create parallel project structures.

In the second half of the project (i.e. post the internal review workshop) the Coalition became increasingly aware not simply of short comings in existing post-harvest and general agricultural service provision, but specifically of the gap between national policy and implementation

strategies and capabilities. MoFA's vision is of a demand-driven service in a decentralised system, based on partnership between the government and the private (including voluntary) sector (MoFA, 2002). The team realised that while MoFA's policy objectives[7] are exemplary - and this project's PH objectives are in accord with many of these components (e.g. farmer driven extension, national innovation systems more responsive to the needs of the poor) – the challenge for the Coalition was to address strategic inadequacies in the delivery systems. The approach that evolved in the light of these perceptions expressly sought to tackle failures in the existing mechanisms and systems, and most recent findings confirm the appropriateness of our endeavours – albeit there is still a way to go. This position was articulated at the June 2004 workshop, and is documented in the associated report, Responding to Diversity (Dissemination output 10).

What other institutional factors were seen as being important?

A number of institutional issues arose throughout the process, but for reasons of definition and understanding already referred to were not necessarily perceived or presented as 'institutional factors'. These issues are further elaborated under *Section D, implementation process*.

The following factors (detailed in Dissemination outputs2, 6, & 10), deriving from the process and hindsight rather than from the initial design, did however play an important role in constraining or facilitating the working of the Coalition, with most recurring on workshop agendas:

- Project ownership issues: differential capacity, levels of engagement & application etc. of coalition members, meant that there were significant differences in the levels of familiarity with the project memorandum (objectives-led management, logframes, research processes, CPHP etc) and of project ownership between partners.
- Coalition representation and make-up: majority of coalition members including project leader and research coordinator with technical/scientific background; in-country public sector research organisations under represented; in-country social and institutional development (cf. technical and economic) expertise limited; action research experience limited; representation of women poor; private sector only engaged in latter period.
- Complementarities: Different agencies or individuals clearly brought different skills and experiences to the table, which together were mutually beneficial (e.g. MoFA and the NGOs provided complementary field level coverage; NRI offered the conceptual underpinning and writing skills).
- Coalition structure: Two tier structure evolved with project leader, research coordinator, technical and social advisors becoming a core team; this in part was influenced by roles, responsibilities and incentives, but may also have evolved in response to management and coordination challenges.
- Constraints & inhibitions re extending coalition: Reluctance by core members or omission to follow up opportunities to formally engage with other key stakeholders (e.g. CIDA, FARMER project, Lowland rice project, Ecumenical Training & Consultancy Centre).
- Communication factors: 'Cultural' and capability differences, particularly between Northern and in-country partners re written materials; similar electronic (computerisation, e-mail, web access) skew.
- Reporting issues: recurring theme – partners experience differential access and facilities with e-mail (for joint contributions & editing), and have different individual and organisational capabilities and expectations re reporting.

[7] MoFA's nine basic policy objectives cover: farmer-driven extension; empowerment of farmers through farmer based organisations (FBOs); promotion of best agricultural practice; efficient and cost-effective publicly funded services; the broadening of extension services delivery; development of appropriate institutional structures at national, regional and district levels; implementation of an effective monitoring and evaluation system (involving major stakeholders); broad based human resources development programme; and, responsiveness to the emerging issues of the HIV/AIDS pandemic, environmental degradation and poverty reduction.

- Monitoring & evaluating coalition process: Irrespective of overlapping mission statements focusing on bringing benefits to rural communities etc. most partner organisations are unfamiliar with M&E practices, and do not measure their progress against organisational objectives.
- Incentives, rules and sanctions: Failing attendance and performance necessitated rules and sanctions; incentives, and particularly payments for activities, were frequently contentious.
- Gender and poverty issues: Women very poorly represented amongst state and voluntary service sector providers; limited active concern with addressing gender issues; wide perceptions of poverty (including the 'lazy' poor); pragmatic approach to donors' agenda and perceptions of poverty.
- Coalition partners' existing skewed farmer-contact base.
- Established practices vs. process: Predominant - institutionalised – practice and individuals' preferences for clearly defined instructions and delineated, unchanging tasks rather than being given more flexibility to identify and resolve constraints; the latter however risk time and resource over-runs.

Section D Implementation process (5 pages)

How was participation maintained among the different stakeholders (the Managing Partner(s) and the Core other Partners and, where relevant, user communities) in the research process?

Participation of coalition partners

The initial formation of the Coalition, besides being prompted by the CPHP and the associated funding incentives, was built in major part on existing linkages between individuals and organisations. Most of the partners already knew each other and many already had experience of working together, including involvement in earlier CPHP projects. These pre-existing groupings contributed the bedrock and perhaps some of the mortar for consolidating the coalition partnerships. It has also been suggested that they – the pre-existing groups – or the underpinning mutual interests, determined the alignment of members in subsequent disputes, influencing outcomes (i.e. had the effect of resisting 'alien' ideas and/or the involvement of other parties (Dissemination output 11).

In addition to the activities and working agreements set out in the PM, it was agreed at the inception workshop (February 2003) that in-country partners would meet at least once each quarter to discuss progress and make their contributions to quarterly reports.

The introduction by CPHP of the *project inception report* in May 2003 served as a further prompt[8] – and provided opportunities[9] (e.g. the project leader [PL] and research coordinator [RC] attended CPHP hosted meeting in Accra; the PIR included sections on outline monitoring plan and framework, and description of the institutional context) – to consolidate communication and participatory practices within the Coalition. In response to the requirements of the PIR the management team (PL & RC) had requested members to submit reports on recent activities. This procedure however was not immediately 'institutionalised'.

Following a visit by the social development advisor (SA) in June 2003, a set of guidelines for coalition management (Dissemination output 6) was developed, which included ideas and actions relating to strategies for both internal communication and engagement with wider stakeholders. In response to this the PL and RC instituted monthly coalition meetings (Dissemination output 4), and the submission of monthly progress reports from coalition

[8] The development of a more comprehensive communication strategy as set out in the PM (section D16) had been inadvertently pushed off the agenda for the inception workshop.

[9] These were unfortunately countered by the PIR submission deadline, which was geared to a regional programmes management meeting in RSA on 2nd June 2003, and thus its late introduction precluded the involvement of most coalition members from the PIR development.

partners. These meetings were supplemented by further meetings or workshops during the visits of the NRI technical (TA) and social (SA) advisors[10] which were also documented.

When, as latterly has happened, attendance at meetings or the production of reports faltered and blandishments failed, the PL introduced - and on one occasion enforced - sanctions. These constituted withholding attendance payments. Attendance generally by most coalition partners, all with their own busy agendas, has been good and during recent workshops often over and beyond the call of duty.

Participation of field staff

The agencies in the Coalition are represented by key Tamale-based personnel, or on occasion their deputies. The planned fieldwork was generally undertaken by the agencies' respective field staff, under instruction from and supervision by the representatives. Joyce Bediako of UDS, the in-country social researcher, used both her own staff and the NGO field staff to help facilitate her fieldwork. The nature of the research undertaken by field staff is elaborated in Section E.

To undertake these planned activities field staff received instruction from the management team which included inputs on the following: good storage practices, insecticide treatment, use of plant materials, solarisation, instruction for LGB flight traps, and use of decision-support-trees for maize and cowpea storage (Dissemination output 3).

Several field staff also participated in the three main Tamale workshops and in the development exercise of the responsiveness tool box at Dalun. Both the review workshop (March, 2004) and the diversity workshop (June 2004) deliberately set out to reinforce the engagement of and learning from field staff. The objectives of the latter workshop included '*to concretise the concept of, and need for,* responsiveness *amongst PH extension service providers, with coalition members and field staff*', and the programmes in all cases were designed to ensure full participation by field staff. The June workshop specifically included group work in which field staff identified operational constraints and opportunities to their work, both project and generally. They assessed, again in small groups, recent extension exercises in which they had been involved, and contributed with others to group exercises identifying the implications both for service providers at the organisational level (i.e. DADU) and for frontline extension staff in terms of tools and practices, in addressing differences between locations/communities, and inter- and intra-household diversity. The 'constraints and opportunities' exercise in particular afforded diverse field staff the opportunity to raise a number of issues stemming from the design of the field research, management and supervision of the field work, and from factors relating to the 'external' environment (Dissemination output 11, particularly Tables 3, 5 and 6).

Field staff were not only involved in the development of the project's *diversity response approach* (DRA) but played a central role with coalition members in the development of the *responsiveness tool-box*, a mechanism for bringing together the DRA with the decision-support tools. This approach, which was built on the findings of their research with farmers, has involved specific training and tool development inputs, covering village protocols, livelihoods analysis, wealth or well-being ranking, secondary data collection, timelines, seasonal and monthly calendars; both in the 'classroom' through direct instruction and role play, and at village level in pre-testing exercises.

Engagement with farmers and other stakeholders

Farmers engaged in research activities as follows:

[10] These included the following visits: SA, June '03; TA, November '03, TA & SA, March '04; TA & SA, June 2004; SA, October '04; TA & SA, November '04.

- As PH stakeholders attending the community meetings organised by MoFA, CAPSARD, CARD and OICT in their respective operational constituencies (Activity 3).
- As selected participants receiving training and testing grain storage options in the project districts (Activities 8 & 9).
- As interviewees and key informants in the assessment study of earlier mud-silo promotion by the UDS social scientist and her team (Activity 5).
- As key informants in the wealth ranking exercise that took place in Tampe-Kukuo village in June 2004.
- As key informants, participants and focus group members in the wealth ranking and other PRA exercises which took place in Dalun village, October 2004.

What were the major changes that took place during the implementation period? For each one, explain why they came about and how well did the project manage them?

Process projects do not exhibit the same degree of separation between design and implementation as more traditional or blueprint projects, so that a number of design changes brought about during implementation have already been referred to and explained in the extended 'institutional design' section above. These include the following major changes:

- The switch from a technology-driven approach to a people-centred or livelihoods approach.
- Acknowledgement that current PH extension practices and delivery are skewed in favour of contact or progressive farmers, whose activities, resources, needs and priorities are strategically different from those of a sizeable minority of poorer households.
- Familiarisation with government extension policy and re-familiarisation with respective organisational mission statements; and discovery of the 'nexus' between the written rhetoric and reality in practice.
- Recognition of rural diversity, including the identification of four main diversity 'arenas'; and consensus that service providers should be responsive to the needs and priorities of different communities, households and individuals, in an equitable fashion (i.e. determined by their comparative needs).
- Ensuring that the research activities are objective-led (putting the logframe rationale into practice); performance is measured against objectives; and 'divergence' addressed (e.g. poor performance remedied or poor design revised).
- Identifying and coming to terms with issues associated with 'process' (both project- and coalition-related) as opposed to 'product' (i.e. outputs, deliverables).
- Increased profile and role for social science inputs (e.g. social and institutional analyses (participatory and group working) building the capacity in these matters in existing, predominantly 'technical' personnel

Revisions of the logframe were undertaken by the core team based on developing awareness of the lack of relevance of some activities to the project and end-users, and also on time constraints. These changes included rewording and reframing of outputs and were reported in earlier mid-term reviews and quarterly reports. It was felt that this process, which was undertaken as an interactive exercise by members of the team and included some 'revision' of logframes generally, signified an increase in ownership of the project as spelt out in the project memorandum by the management team and other partners.

In changing the direction of the project – actively seeking a means to enable service providers to be more responsive in their engagement with farmers, rather than simply generating lots of extension materials to be distributed amongst a range of intermediary stakeholders – the Coalition was in effect engaging in action research with a strong institutional focus. This

necessitated familiarisation[11] and coming to terms with the aims of northern PH knowledge management agencies, and particularly MoFA, and assessing their implementation strategies and organisational performance. The process of adopting a more critical approach to the working of organisations (e.g. MoFA and the NGOs involved in earlier mud-silo promotional programmes), particularly when one is an employee, or part of a relatively small network of local players, is not easy. People who challenge cultural inertias and/or 'black-holes' within an organisation or system are not always thanked. Significant progress was however made on this front, and following a series of exchanges and group working activities, the Coalition resolved to commission a private sector training organisation to help consolidate development of the new approach and a 'responsiveness' tool-box.

What were the strengths and weaknesses of your monitoring system? How did you use the Information provided by your monitoring system?

The most obvious weakness of the monitoring system, or more accurately of the team and its leadership, was its delayed introduction. Prompts offered by the CPHP in its *project inception report* subsequently reinforced by the social development advisor (Dissemination output 6) were not initially heeded. To what extent the poor receptivity can be ascribed to the prevailing organisational culture (MoFA), to the management team's inexperience, to the inexperience and/or passivity of the Coalition, or to the delivery mechanisms of CPHP and the NRI advisor, are open to interpretation. One argument that has already been voiced in wider circles is that the somewhat hasty introduction of the coalition approach, which took little account of the costs associated with forging new institutions, in some cases placed considerable burdens on the shoulders of inexperienced people; monitoring plans and frameworks, in addition to logframe reviews and revisions and descriptions of institutional context, were initially a bridge too far.

Initial monitoring was a function of the monthly meetings and reports of the Coalition members inaugurated in August 2003. These served to identify and report gaps and inefficiencies in the work programmes of the respective partners, and often to suggest remedies – a check and balance approach. This system however was 'activity' focused, and poorly linked to assessing process and performance against output objectives.

The first general and participatory assessment of progress against outputs took place in March 2004 at and after the Review Workshop. Indicators had been identified for the respective workshop objectives, and opportunities and issues were identified in the processes to date. These are summarised in Table 1.

Table 1: Key issues and opportunities drawn from review workshop (March 2004)

➢ Need to build in evaluation (& monitoring) mechanism into all activities.	Otherwise how do we know if we have achieved the desired outcome (or are on course)?
➢ Need to more rigorously explore community 'diversity' (wealth and well-being status, age and gender, socio-cultural differences, belief and values systems etc).	Farmer post-harvest decision-making is influenced by a range of factors, many of which relate to the farmer's or household's resource base (assets) and livelihood options, and to the external factors that mediate their livelihoods (e.g. weather, prices, bye-laws, decentralisation of services, lack of credit facilities etc). Output 1 refers to "farmers' different sets of circumstances"; Output 5 refers to management options "appropriate to their (respective) needs and resources".
➢ Project has 'skewed' emphasis on more 'go-	The involvement of farmers in the project to date has been skewed in various ways, and for various reasons - including the fact that the poor

[11] Most coalition members were unaware of changes to MoFA's mission statement and unfamiliar with existing agricultural and extension policies. Copies of the new agricultural extension policy (MoFA, 2002), brought to Tamale from Accra by one of the advisors, for example, were eagerly photocopied by coalition members.

ahead' farmers.	harvest meant that many farmers had little or no grain to store and were not then considered for the trials. The present identification and selection of farmers by field staff (based on 'contact' farmers, 'volunteer' farmers, and/or more successful or opportunistic farmers) may tend to emphasise technologies, aspects of scale etc better suited to these particular farmers, and exclude options relevant to less dynamic or well off farmers.
➢ Limited 'mainlining' of farmers in project processes to date.	Need for parallel event (to review workshop) for farmers to inform and educate us. Outputs 4 (service provision - response) and 5 (farmers 'demands' voiced and met) also represent these two sides.
➢ Issues relating to the 'subsidisation' of technologies	Issue of sustainability, and whether through resource and training inputs we are 'subsidising' a skew selection of farmers, and perhaps in turn consolidating pre-existing inequalities in communities.
➢ Coverage issues	Several references made to coverage in the context of having impact - see promotion.
➢ Seasonality issues	Arose because of perceived shortcomings in project activities due to external factors (e.g. drought) in the farmer's environment.
➢ 'Decision support tree' tool predominantly based on 'technical' factors.	Need to broaden DST tool to incorporate 'social' factors, thus pick up on diversity issues and have broader applicability and relevance.
➢ Unclear what meaning people give to key words like 'technology' and 'practice'.	Project documents refer to technologies, practices, management options, treatments etc, but the intended meaning is often unclear. Given these ambiguities can we be sure that we correctly interpret and understand what farmers are telling us?
➢ Build on 'good practice' already existing between organisational stakeholders.	Use the OICT/MoFA 'model' for sharing and developing training materials to accomplish project activities (e.g. production of extension materials, training modules, curriculum development material, promotional material etc)
➢ Institutional issues relating to MoFA	Strong feelings were expressed by MoFA staff on a number of issues. The project should emphasise its potential to help MoFA deliver against its 'mandate'; mainline the positive aspects of MoFA as far as possible, while avoiding the negative aspects.
➢ Promotional opportunities (see group work for detailed ideas)	➢ Use existing promotional structures: requires better understanding - 'analysis' - of existing organisations, identification of key posts and people etc (e.g. stakeholder analysis) ➢ Mainline MoFA in promotion. Project/PH unit must not operate in parallel with MoFA ➢ Develop collaboration with other players (e.g. other NGOs, unit committees etc)
➢ Opportunity to learn lessons on workshop design	➢ Need more preparation time (period of 1 week, 4 days minimum) ➢ Need for committed design team for these '4' days work. ➢ Group work needs to be 'designed' by whole team and pre-tested ➢ Participants have to be selected in line with the workshop objectives - not simply the 'usual suspects', 'paid' attendees etc.

The table above, together with an assessment of strengths and weaknesses of activities (see Table 3), were subsequently used as indicators, and formally scored at the Diversity and Evaluation workshops (Dissemination outputs 10 & 11).

What organisations were involved at the end of the project? Were there changes to the coalition (joining/leaving) during the project? If yes, why?

Partner details	Role in project	Previous experience
Mr Fusieni Andan Ministry of Food and Agriculture, Tamale, Ghana	Project leader, post-harvest unit officer, MoFA Tamale	Key co-ordinator of post-harvest R&D in Northern Region of Ghana
Mr Solomon Bariyam OIC, Tamale, Ghana	Field staff leader, participating NGO	Extension specialist with experience of working for both MoFA and NGOs.
Mr Sulemana Stevenson, CAPSARD, Ghana	Field staff leader, participating NGO	NGO manager, experienced extension worker and participatory trainer
Mr Naresh Sukhla, CARD, Ghana	Field staff leader, participating NGO	NGO manager, experienced extension worker
Dr Rick Hodges, Natural Resources Institute, Chatham, UK	Technical advisor	Extensive experience of the development and extension of post-harvest technologies
Mr Mike Morris, Natural Resources Institute, Chatham, UK	Livelihoods and institutional development advisor	Extensive experience of action research and participatory agricultural development
Dr Samuel Addo, Private Consultant, Tamale, Ghana	Research Co-ordinator	Experienced post-harvest researcher working on several previous CPHP projects
Dr Joyce Bediako, Faculty of Agriculture, University of Development Studies, Nyankpala, Tamale	Agricultural economics researcher	Experienced agricultural economist

One of the core partners, Mr. Samuel Arku-Kelly of OIC, Tamale, went for further studies at the University of Greenwich, UK and was replaced by Mr. Solomon Bariyam, also of OIC, Tamale.

Mr. Osman Abdel-Rahman of the Ghanaian Danish Development Agency, and Mr Zacharia Abdul-Rashid of NGND, were involved in the development of the responsiveness tool-box and in the associated 'training' of coalition members and other stakeholders, in the classroom and village.

During project workshops the Coalition was joined by, or made contact with representatives from, the following:

- Women in Agricultural Development (Mercy Falley)
- Farmer Based Organisations Development Officer (Luke Nayi)
- FARMER project

How will (have) project outputs affect(ed) the institutional setting?

The research proposition identified at the onset of the project was that:

The livelihoods of subsistence farmers would be improved by the adoption of better grain storage practices; and that the Coalition could devise a 'way' of facilitating choice by farmers of storage methods more appropriate to their needs, from a range of existing options.

We believe that the proposition holds true, and that we are on course to deliver against this claim. The project initially stumbled however because of weaknesses in the original methodology and associated activities, together with a measure of blindness (or denial?) to pervasive weaknesses in the organisation and practice of PH (and other forms of) service delivery, and the different views and discourses held by key players about agricultural development (e.g. productivity focused reforms vs poverty reduction). Coming to terms with the latter elements and revising the project methodology in terms both of coalition or process working and of devising the framework for facilitating farmer choice, were gradual and interlinked processes but, we feel, led to a breakthrough.

A further parallel discovery relates to the 'range of existing option'. These were highlighted in the original design in order to comply with CPHP's commendable desire to increase the impact of technologies developed in earlier projects. In practice however, the somewhat exclusive focus on these technologies in training and field trials, dulled the team's and frontline field staff's appreciation of the limited fit of this portfolio to diverse farmers needs, and of other options (e.g. emphasising storage hygiene measures for poorer households with small quantities). Consequently the range of farmers participating in the field research activities narrowed even further. It also took time to realise that when field staff are in 'demonstration' mode, then generally farmers are less likely or able to express different concerns and field staff are less likely to provide space for or hear farmers' concerns.

The key 'technical output' of the project is an approach to working with farmers – the diversity response approach (DRA) – and a mechanism, the 'responsiveness tool-box' (RTB), which brings together the approach and a set of participatory and technical tools, in a way that will both facilitate the understanding and capability of key PH knowledge managers to engage with all farmers. The challenge however is not in devising or selecting participatory and technical tools, but rather in changing the attitudes - and then capabilities - of key players in PH service provision. The RTB is still under development, and features together with an exploration of farmer empowerment methods, in the follow-up proposal: *Learning from farmers: The post-harvest tool-box approach.* It is not envisaged that the RTB be widely and systematically deployed to scope the circumstances, resources, needs and priorities of myriads of farmers', but rather that it is used as an awareness raising and training tool, with the interaction with farmers being added to a library of case studies.

A number of things have already been done to ensure that this key technical output does bring about the necessary organisational and attitudinal change, both amongst the team and other PH knowledge managers:

- The Regional Director of Agriculture for Northern Region has been made the project leader of the follow-up proposal, to ensure his working familiarity with the DRA and RTB, their institutionalisation within MoFA's future training and planning exercises, together with the 'insights' that the new project will hopefully make on farmer empowerment.
- Several District Directors have been involved in the process to date: all others and the Regional Directors for Upper East and Upper West will receive copies of key project outputs.
- A funding proposal has been submitted to the FARMER project for 6 training courses using the RTB, 2 courses to be held in each of the 3 northern regions. Approval of this proposal itself necessities the involvement of regional and district directors of agriculture.
- Contact has been made with the Minister of Food and Agriculture, the Hon. Major Courage Quashigah.

These strategic activities themselves represent a change in the way of working and relating for the Coalition partners, as does the invitation and involvement of the private sector training organisation, GDCA. The follow-up project is intended amongst other things to consolidate and extend these crucial changes.

Section E Research Activities (15-20 pages)

Activity 3 - Stakeholder meetings in target areas

The objective was to collect data on existing practice among farmers as a baseline for project monitoring and evaluation, identify technical options relevant to the needs of the target groups, plan promotion of selected technologies with target groups and engage farmers in the development of a decision-support tree.

Project field officers (from CAPSARD, OICT and MoFA) under their supervisors in fifteen communities held stakeholder meetings with over 150 collaborating farmers (see Table 5 p. 26), 20 more than originally planned. At these meetings, farmer activities such as crops harvested, type of storage facility used and length of storage were discussed and recorded. They were also briefed about the follow-up activities of the project and to solicit their cooperation in these activities.

Activity 4 - Implement LGB risk monitoring

The objectives of this activity were three-fold, 1) to ensure the reliability of warnings of years when attack by the Larger Grain Borer (*Prostephanus truncatus*) would seriously affect farmers 2) to use our knowledge of the actual LGB risk in helping to decide on the best storage options chosen by farmers through the decision support trees, and 3) to institutionalize the LGB warning capability.

LGB risk monitoring was implemented at four locations in Northern Region, namely Tamale in the centre of the region and Yendi, Saboba and Cheriponi to the east. This involved monitoring actual LGB numbers using pheromone traps at each of these locations and at the same time predicting the magnitude of trap catches by running the LGB 'model' that generates predictions based on climate data from meteorological stations in Tamale (for Tamale) and Yendi (for Yendi, Saboba and Cheriponi). There was a strong match between observed catches and the catches predicted from climate data (Figs 2 & 3) although some adjustments of the model, which had been developed in the Volta Region of Ghana, were required to take account of the more extreme climatic conditions in Northern Region. It was found that climate data from Tamale could not be used for Yendi, Saboba or Cheriponi or vice versa, suggesting the conditions in eastern Northern Region are different from Tamale. The differences are probably both climatic and vegetational; these factors are linked. There should therefore be considerable caution when extrapolating LGB predictions over wide geographical areas and there is no question of just relying on climate data from Tamale to make predictions for the whole region. During the course of the study there was no serious LGB threat as in Tamale numbers of LGB were low in 2003/2004, and in the other locations number were low from October onwards, around the time of harvest. However, towards the end of 2004 the risk was rising and at the time of writing there is a possibility that a risk warning may soon need to be issued in at least eastern Northern region.

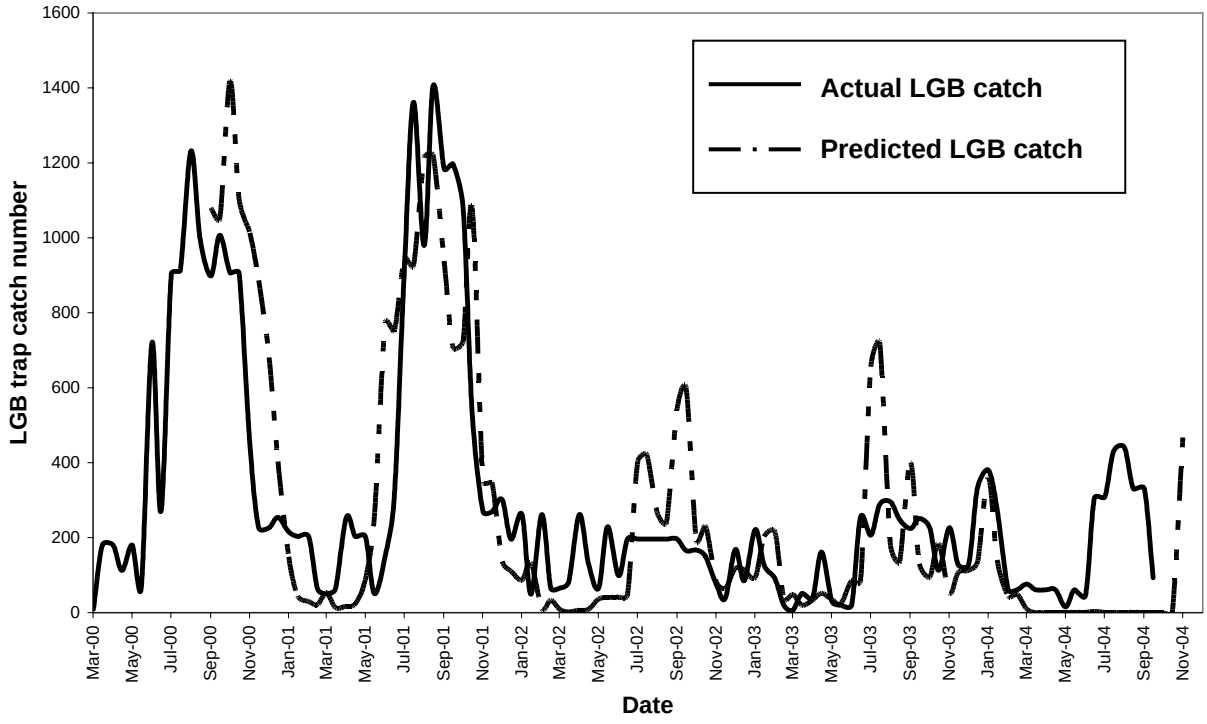


Figure 2: Actual and predicted catch for Larger Grain Borer in Tamale (Ministry of Agriculture site, March 2000 - November 2004

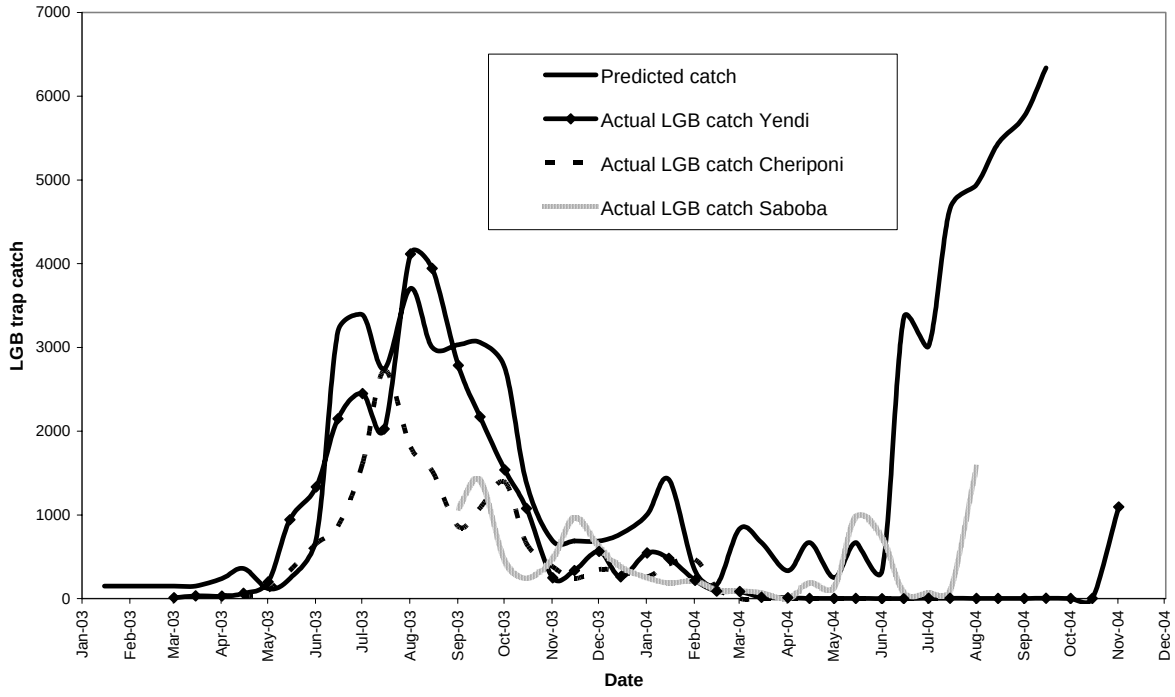


Figure 3: Actual and predicted catch for Larger Grain Borer in Yendi, Saboba and Cheriponi, January 2003 - November 2004

It had been hoped that an institutional capability for making LGB predictions could be established as part of this project. However, although a group of staff were taught how to

add data to the model and how to make prediction, this did not lead to an independent capacity, partly due to the fact that the most interested party, the District Director Yendi, was moved to another post. In the medium term, it is planned that NRI will continue to enter data and make predictions.

Activity 5 - Clarify reasons success/failure of mud silo adoption

Field visits were made to Saboba/Cheriponi and East Mamprusi, localities where mud silos are used traditionally, and to Gushiegu/Karaga, where they have been adopted recently, to learn from farmers about the success and failure in adopting silos and problems in working with mud silos. This was undertaken to draw conclusions on how mud silos should and should not be promoted, and to identify key factors to consider when helping farmers to decide on the most appropriate storage options. Methods adopted included both informal and formal approaches, involving Participatory Rural Appraisal (PRA) techniques, and limited use of structured and semi-structured questionnaires respectively, for the collection of community based primary data, which was supported by a consideration of existing grey literature.

Detailed observations were made on issues to consider before silos construction, during construction and use and maintenance issues after construction. Previous promotion campaigns had run into some difficulties although there was good evidence that mud silo offer the benefits of improved food security by reducing storage losses, they also enable crops to be stored for longer and so give greater marketing flexibility. These advantages improve livelihoods and can increase the production of cash crops such as rice. It is essential however for agencies to appreciate that households have different means and resources, produce different amounts of crops, and ultimately have different needs and priorities in any one season. This 'diversity' means that not all households would necessarily benefit from silo storage. Failure to recognise these implications of farmer diversity would not only weaken the impact of any silo promotion campaign, but could be drawing resources away from the more equitable approaches of matching technologies and targeting households.

A report has been prepared on the finding of this study (Dissemination output 1), the insights gained have been included in the latest version of the decision support trees and a leaflet prepared to publicise recommendations on mud silo promotion (Dissemination output 13) which has been distributed to relevant post-harvest institutions (see key contact list Annex IV). A matrix of the findings, conclusions and recommendations of this study is shown in Table 2.

Activity 8 - Field staff to offer training in grain storage options to identified farmer groups and collect information on current storage technology and problems

This activity included field staff working with households in the 15 communities identified in Activity 3, to offer training in storage technologies that they prefer and collecting survey information on the participating households as a baseline for later M&E.

The farmer training started in May 2003 and spanned a period of 4 months, during which time the selected farmers were taken through a series of topics. Field staff who received earlier training from the project coalition (Activity 2) proceeded to train farmers in grain storage options. In all, 160 farmers from the fifteen communities benefited from the training inputs. Topics that farmers were trained in were:

Table 2: A Summary of the conclusions and recommendations of the mud-silo survey: A matrix for exploring the process/technology with associated problems

Technology ➔ **Process features ⬇**	**Role of promotional programme/agencies, MoFA, OICT and ADRA** (differentiate performance)	**Hardware** (e.g. physical aspects)	**Knowledge** (e.g. 'know-how', skills, experience)	**Organisation** (& institutional aspects)	**Product** (storage crops)
Promotion / pre-construction period	1. C - MoFA & OICT promotion exercise done in rush; farmers not adequately. 2. C – Preparatory study recommendations overlooked with negative consequences	1.C- Bimoba type mud silo used for demonstration and experiments on storage efficiency for many years used for promotion. 2.C- Education of farmers on the need to provide recommended component materials not adequate. R- More elaborate preparation required in terms of farmer education and storage of construction materials before commencement of similar exercises in future.	1. C- Farmers informed of mud silo programme by MoFA, OICT and ADRA representatives in beneficiary areas. 2. C- The know-how, skills and experiences of selected builders seemed inadequate. 3. C- The training of a number of beneficiaries per community not implemented. R- Experienced builders preferably from the traditional origins better suited for such massive promotion exercises. R- The training of an adequate number of young farmers from beneficiary communities is urgently necessary.	1. R- Community level organisation is necessary as a pre-requisite promotional information transmission and village selection criteria for self-build training programmes.	C. Apart from yams farmers were encouraged crop types could be stored in mud silos
Construction period	1. C – poor supervision of imported artisans 2. R - Builders need tight(er) supervision. 3. R - Period to promote building programme is after rains: materials	1. (C) 'Piece-work' led to too much haste; no time for curing & hence shoddy construction. 2. C - Some evidence that 'alternative' materials were inadequate and weakened structures; and that foundation	1. R - Period for silo construction is after rains when materials are available and sufficient time should elapse for curing before initial loading.	R-(As above) Organisation should hire experienced artisans to build and to train locals for durability and maintenance of structure as well as	1. (C) Traditional users of mud silos, who tend to produce surpluses for different crops, accommodate these in 'compartmentalise

	available and loading will not take place before suitable time elapsed.	stones were poorly selected. 3. R – use proven materials; train farmers in finding/identifying (or planting) recommended clay, binding grasses etc; undertake efficacy study of alternative materials?		the self-sustainability of the technology.	d' silos. (R) Design should take account of (present & potential) production profiles (see 1).
Utilisation period - use & maintenance issues	R. The requisite training in care, maintenance and utilization should be obligatory to promotion agencies in subsequent promotions to avoid a waste of resources through damages to structures and produce.	1. (C & R) Where farmers contributed materials (e.g. cash, materials, labour for fetching water etc) for construction, maintenance more likely to be assured (OICT). 2. C – storage compartments give silos additional strength and utility. R - Design must take account of people's needs (e.g. size of opening be narrowed and design types be available for categories of people /weak/ strong/ adults /children) and compartments must be introduce for increased usefulness and strength of structures.	1. (C) Lack of education given to 'beneficiaries' for the care and maintenance of structures. 2. In Saboba/Chereponi district where large size type silos are used, people report storage pests enter during loading. (R) People need to be informed on how to locate and maintain structures for security R – Farmers might be trained in storage practices to counter the introduction of pests during loading.	C- Promotional institutions could not provide sufficient education to beneficiaries on the care and utilization of structures.	F – In Gushiegu/Karaga 2002, of a total of 6.42 bags of maize reportedly lost by respondents during storage only 6.5% of the damage was associated with mud silos. C- The mud silo could reduce storage losses by 93.5 percent if properly utilized. R- Non-beneficiary farmers have urgent need for the structure.

- Good storage practice
- Insecticide treatment
- Plant materials for grain storage
- Solarisation
- 'Decision support trees' for maize and/or cowpea

Among the numerous farmer storage practices discussed, were: kunchuns, mud silos, jute sacks, poly sacks and kambong. Training was given to identify insect pests using local names of live and dead specimen from farmer stores. Losses due to insects (weevils and in some areas, the larger grain borer) were between 20-30% of yield when rough estimates are made on quantity of grain damaged in a pile. Getting farmers to think of dividing their sacks into 10 parts did this and then estimating how many sections would turn bad during storage. This method captured the way the farmers estimated their losses. Farmers were happy with mud silo use and treatment with Actellic Super EC for maize and solarisation for the protection of cowpea. Farmers were assisted to discuss their grain storage 'decision support trees/decision-making trees' and this was reported to have been exciting but sometimes tiring. Storage options were explained to them and training was developed in line with the options identified during their 'decision support tree' discussion.

Activity 9 - Field staff to assist the implementation of improved storage options with selected farmers/farmer group

This activity included field staff working directly with selected households to enable them to implement chosen storage technology, field staff recording the difficulties experienced by farmers in implementing the methods, this information was used as feedback to improve extension material and promotion methods.

Project staff assisted selected farmers from 15 communities to implement storage option decided on by farmers. Storage, which was supposed to have started in October 2003, was delayed until December 2003 because erratic rainfall had delayed crop production. Out of the 158 farmers trained (CAPSARD – 49, OICT -54, MoFA &CARD – 55) only a little over 100 participated in the farmer experimentation. This was due to factors such as poor harvest (especially for females), some farmers not being ready at the time of start of project experimentation and some not storing for as long as 6 months. Farmers made request for inventory credit, storage chemicals, solarisation equipment and mud silo technology.

Activity 10 - Participatory evaluation of implementation of storage options

This activity was undertaken to allow farmers to express their opinions directly about their ability to implement the storage methods being promoted. It was envisaged that this will give invaluable farmer feedback on both storage methods themselves and methods of promotion that can be used to adjust and revise the project's method of operation.

Information collected from farmers from the target communities at the start (early December) and mid-February showed that some problems associated with the storage options were:

- High cost of Actellic Super EC (price ¢50,000 for 50 ml bottle too much for many farmers to afford)
- Unavailability of storage chemicals at the right time
- Lack of water for mud silo construction
- Some mud silos had collapsed (OICT has just begun the evaluation of this selected storage option).

Maize grain samples were collected from all participating farmers in the mid-January - mid-February 2004 and submitted to the project office. The main crops stored, main insects storage structures used and treatment options used by farmers is summarised in Table 3.

Table 3: Assessment of participating farmer stores

Crops stored	Insects in store	Storage structures	Treatment
Cowpea, Maize and Bambara nuts	Mainly maize weevils (*Sitophilus* spp)	Jute sacks (most common, more than 50%), Kambong and Mud Silos	Actellic Super, Non-treatment ('good hands') and Solarisation

Field staff recorded the difficulties experienced by farmers in implementing the different storage methods. This information will be used as feedback to improve extension material promotion methods.

Activity 12 - Workshop to revise promotional strategy and plan 3rd year

This was not originally planned as a research activity but in the event it became a watershed for the direction of the project, both the learning alliance (coalition elements) and technical direction. The workshop itself became a means for researching successful post-harvest promotion and dissemination in the environment of Northern Ghana initiated through a systematic consideration of the strengths and weaknesses of project performance (Table 4).

The workshop revealed that progress had fallen behind schedule on the development of the generic decision support tool, and in the development of an overall promotional strategy and the related production of 'promotional' materials (e.g. extension materials, curriculum development materials, project promotional information). Reasons for this included the late and relatively poor harvest last year, which had both delayed project activities and limited the potential number and range of farmers able to participate by trialling of storage management options due to the scarcity of grain. Not explicitly stated, but otherwise addressed in the workshop, was the challenge of the 'coalition approach', in which for the first time in a decade, a CPHP intervention in Northern Ghana, featuring a coalition of local players, was being led and managed locally. While this is undoubtedly a positive move, it has also placed significant pressures on the management team, who has been tasked with rising to many new and difficult challenges.

The workshop also found that there had been only limited success in 'mainlining' farmers in the project's activities. The workshop itself typified this shortcoming, and participants agreed that, progress allowing, a second parallel event should be designed to hear and learn from farmers. The narrow representation of farmers derived in part from the scarcity of grain and thus of farmers in a position to participate, but also it seems probable that discussions with farmers and field staff may have focused unduly on the hardware aspect of technologies. In turn this may have played to those technologies - management options - that are less frequently used by or less suited to poorer farmers. Similarly while development of the 'decision-support tree' tools has embraced the technical aspects relating to decision-making, socio-cultural factors had yet to be incorporated.

Table 4:. Strengths, weaknesses and gaps identified in project performance

Responses by three workshop groups are numbered G1, G2 and G3

Activities	Strengths	Weaknesses & gaps
Activity 2: Implementation of training program for all field staff on grain store management options. Q: *Were training programmes (for field staff*	- NGO's representation okay (G3) - NGO field staff representation adequate (G3) - Quality of training & training materials good (G3) - Duration of training okay (G3) - In-house supervision & supervisors	- Inadequate MoFA field staff trained - More communities should have been covered (G3). - Not enough materials for demonstrations (G3). - Many farmers still use use jute

& farmers) standardised and/or was 'good practice' used by one partner shared and taken up by others?	also supervised (G2) - GO and NGO collaboration (G2)	sacks (G3). - Breadth of technologies on offer limited (G3). - No representation of farmers (G2) - Duration of training programme short (G2) - Training not evaluated
Activity 3: Holding of stakeholder meetings in target areas by field staff.	- Helps store produce long enough for food security (G3) - Help store produce for good price later (G3). - Holding meetings with farmers and listening to them (G2)	- Poor harvest denied participation of many farmers (G3). - Information narrowly targeted (G3). - Technology narrowed to few crops (grain) (G3). - Poor representation of women (or disaggregation by other identities) (G2) - Selection of farmers skewed towards 'known' farmers (G2) - Heterogeneous group meetings lead to some voices not being heard (G2)
Activity 8: Provision of training in grain storage options to identified farmer groups and collection of information on current storage technology and problems by field staff. Q: *Presentations included reference to data & information collected, but why were no findings (post data analysis) forthcoming?*	- Selected farmers storage option based on decision support tree (G3) - Many selected farmers did not treat product before storage (G3) - Selected farmers are exposed to alternative storage options (G3). - Farmers income expected to rise (G3) - Provision of storage options and knowing other farmer practices (G3)	- More farmers needed to be trained for wider & fast coverage. - Women participants (largely) absent (G3) - Development of options skewed towards selected (i.e. skewed) groups of farmers. Therefore not all farmers are catered for (G2). - "Good hand" concept not fully investigated / addressed (G2)
Activity 9: Assistance in the implementation of improved storage options with selected farmers/farmer group by field staff.	- Farmers choice of storage options based on type and quantity of crop produced (G3) - Imparting skill to selected farmers on good food storage. (G2) - Selected farmers provide own inputs for treatment (G2)	- More should be trained (mud silos) (G3) - Not all farmers have mud silos (G3) - Limited choice by field staff - assistance narrowed (G3) - Subsidised inputs for 'selected' farmers, raising questions of bias and non-sustainability (G2)
Conceived in terms of all Activities	- Training: training sequence followed - supervisor, field staff, farmers (G1) - Training: element of decision-making included (G1)	- Training: no evaluation during training of field staff (G1) - Evaluation of field staff after training only partial (G1) - Farmers' diversity: issue of diversity left to field staff (G1)

A further key issue identified was the need to ensure that the project was not operating parallel structures to those that already exist within the Ministry of Food and Agriculture, but rather that MoFA should be mainlined in the implementation of the project. The involvement of NGOs in the project, while giving rise to some concerns amongst some MoFA staff was generally seen as a positive element of the project. Moreover, existing modes of co-operation developed between OICT and MoFA around training inputs were identified as providing a structure for future project activities and strategies.

Other issues and lesson learning related to: the need to build in evaluation (& monitoring) mechanism into all activities; the need to more rigorously explore community 'diversity' (wealth and well-being status, age and gender, socio-cultural differences, belief and values systems etc); validation issues relating to 'subsidies' and/or 'incentives' in the trialling of technologies; coverage or scaling-up issues; and issues of seasonality.

The workshop, from design through implementation and evaluation, provided a unique and dynamic forum in which the coalition members were able to present their joint venture to wider stakeholders, learning both from this process and from the contributions of all participants. This led to tangible benefits for the Coalition in the subsequent tasks of reviewing and revising the plan for the coming nine months, and completing the annual report, which included a review and revision of current outputs and indicators. The main thrust in the 2004 plan, instigated by the workshop findings, was to focus on further field testing of the 'decision support tree' tool (Activity 14), and on the systematic collection of data relating to the wider socio-cultural factors that influence farmer storage decision-making (Activity 15). This latter activity was to use a tool developed in Tanzania to explore decision making among farmers participating in a CPHP project on the protection of stored grain with diatomaceous earth.

This activity is described in full in Dissemination output 2

Activity 13 - Development of promotion approaches through a consideration of diversity issues

This activity was originally planned as 'The development of promotion materials'. However, the realisation by the Coalition that effective promotion to farmers would only be achieved if farmer diversity issues were integrated into the extension process lead to a change of plan and a workshop was convened to consider 'Responding to Diversity'.

The workshop aimed to develop the concept of, and need for, 'responsiveness' amongst extension service providers, with coalition members and field staff, and to initiate the identification of practical ways to explore farmer diversity. Linkages between primary stakeholders - researchers, extension staff and farmers - and the complexity hidden beneath these compound 'labels' were explored, both in the general case and for the project. Exercises were undertaken to identify the constraints (and opportunities) currently experienced by frontline extension staff, to explore and map the diverse factors and circumstance that influence farmer post-harvest decision-making, and to reflect on the measure of 'fit' of current extension practices. Four main diversity 'arenas' were identified and an analytical framework established: for differences between HHs, within HHs, between communities /localities, and stemming from other diverse 'external' factors. The framework should help counter the measure of 'blindness' to the diversity of rural communities, and/or to the needs of more resource-poor individuals and HHs, evidenced in earlier work by the Coalition. The implications for service providers and for frontline staff of 'responsiveness' to these 'arenas' were also explored, and potential tools for exploring village-level diversity were discussed.

This activity is described in full in Dissemination output 10.

Activity 14 - Update and upgrade decision support trees

The decision support trees (DSTs) were prepared in consultation with Coalition staff at the start of the project and introduced during initial training and orientation of field staff. They were subsequently upgraded in the light of experience and tested during role-play by several groups during the project review workshop in March 2004. The DSTs are detailed in internal report (Dissemination output 14). The trees cover choosing appropriate store types, including issues to address when dealing with mud silos, essential issues of hygiene and store maintenance, and choosing appropriate treatments for shelled maize, sorghum and cowpea.

It was originally proposed that sociological elements of farmer decision making should be introduced directly into the DSTs, to ensure that selections of storage options would be relevant to farmers' circumstances. However, field experience and the deliberations of the Coalition have shown that this initial idea is impractical. Instead it has become clear that the

DSTs should rest within a framework that provides extension support that is sensitive to farmer diversity. This thinking has lead to the idea of the 'diversity response approach' and the extension 'toolbox' by which it is facilitated (see Activity 15).

It had been hoped that the DSTs would have been developed sufficiently by the end of the project that they could be distributed in printed from for wider uptake. In view of the realisation of the need for a wider approach, the resources for this and other technology based leaflets were redeployed in Activity 15.

Activity 15 - Field staff trained in using the extension 'tool box' to ensure equitable balance of poorer groups and gender in promotion of technology options

At the outset of the project this activity had not been planned. As a result of the Coalition developing an understanding that farmers own decision making should be a part of the extension process, and that decisions will vary between farmers according to their circumstances, it became clear that to tackle this effectively would require approaches that address farmer diversity. Indeed appreciation of farmers' diversity is a key element in the Ministry of Food and Agriculture's own extension policy (2002). But apparently it is not generally addressed. To meet this need and this change in the direction of the project, Activity 15 was implemented in the village of Dalun in October 2004 by the Ghanaian Danish Communities Association with 15 people, made up of coalition members and their staff. The training covered wealth (well-being) ranking, prioritisation, timelines, access, use and control of resources and seasonal/monthly calendar with focus on PH issues and labour usage and gender. This was followed by practice of field application of the new knowledge. The details of this exercise are given in an internal report (Dissemination output 12).

Activity 18 – 'Learning from experience' workshop to capitalise on the learning alliance and progress towards better promotion through recognition of farmer diversity

This activity was originally planned as 'The Promotion workshop and planning for beyond end of project'. The opportunity was taken to consolidate coalition learning and develop a strategy for taking forward plans to implement the diversity response approach in a new short project to be funded through CPHP. The workshop centred around an evaluation of the project's strengths and weaknesses, and individuals' views on this are summarised in Table 5 and discussed in detail elsewhere (Dissemination output 11).

Table 5: Successes and weaknesses identified against process activities as identified by individuals (conflicting view points between perceived successes and weaknesses are set adjacent and shaded)

Individuals' comments on various 'process' aspects		
	Strengths/successes	**Weaknesses**
Design		➢ Design not fully understood / bought into by all coalition members. ➢ Some research activities designed and carried out without reference to what has been learnt elsewhere: capacity/human resource constraint. ➢ Coalition skills bias: predominantly 'technical' (strength), but weak on social side.
Leadership	➢ Coalition members still participating at the end of the project & interaction has shown steady improvement by use of rules. ➢ Capacity building in country of work. ➢ Leadership showed transparency in dealing with the Coalition.	➢ Very limited use of sanctions against non-delivery. ➢ A new concept for in-country work. ➢ Participation of project leader in workshop proceedings disrupted by other domestic / housekeeping duties. ➢ Leader should delegate small tasks (e.g. photocopying, printing) and not repeatedly remove himself from meetings. Leadership requires presence. ➢ Leadership not respected at certain times especially organizing quarterly meetings.
Management	➢ Timely organization of the logistics of workshops. ➢ Management could delegate coalition members to carry out certain activities, which they did. ➢ Team leader and research co-ordinator promptly called monthly and quarterly meeting. ➢ Ability to organize events, workshops etc at short notice.	➢ Managing partners could not meet regularly due to lack of proximity. ➢ Interaction with regional director limited to courtesy calls and not consideration of enabling project to achieve objective. ➢ No participation of regional director in workshops.
Communication / Coordination	➢ Communication strategy established. ➢ Ability to organize events, workshops etc. at short notice.	➢ Securing engagement of 'home team' during the costly visits of the 'away team' (NRI). ➢ Some coalition members were not often available at meetings. ➢ Difficulties in e-mail contact between coalition members. ➢ Feedback on workshop draft reports impossibly long, still waiting feedback (Nov) on key June workshop (draft submitted in October). ➢ Poor supervision of field officers. ➢ Poor time keeping.
Coalition working	➢ Existing co-operation between many coalition members, but weakness if used to exclude others. ➢ There were cordial relationships between members during the project phase. ➢ The coalition process was a first experience for many members especially for the leader. Yet co-ordination was smooth and satisfactory. ➢ GOs, NGOs and private sector sharing ideas to avoid duplication.	➢ Challenge to identify new potential coalition members who could contribute to realization of project purpose, rather than operating a sort of 'cartel'. ➢ Apparent lack of cost-effectiveness associated with roles, responsibilities and payment. ➢ Payment not related to performance. ➢ Tendency to expect or rely on others, rather than undertake work ourselves. ➢ No law binding coalition - still loose entities. ➢ Coalition skills predominantly technical (strength) but weak on institutional/social side. ➢ Securing engagement of 'home team' during the costly visits of the 'away team' (NRI).
Research process	➢ Research work (field surveys, data were collected and analysed). ➢ Some stakeholders were identified to benefit from materials and technologies developed. ➢ Extension staff enthusiastic about use of Decision Support Tool. ➢ Able to supply data on LGB catches and climate regularly. ➢ Farmer participation with field work.	➢ Analysis of data collected during field work and survey was poor. ➢ Data collection was not done well, i.e. late collection and format not followed. ➢ Field staff not conversant with technical language / data collection. ➢ Sample collection was not well done. ➢ Some research activities designed and carried out without reference to what has been learnt elsewhere – a capacity/human resource constraint. ➢ Technology development for other stakeholders was delayed

Research (cont)		➢ Reluctance to make LGB catch predictions in the Tamale office. ➢ Undue focus on activities/tasks without necessarily appreciating the rationale. ➢ Poor supervision of field officers.
Reporting	➢ Quarterly reports met their deadlines. ➢ Two good quality workshop reports plus two training reports prepared. ➢ Documentation of proceedings of workshops and meetings well done. ➢ Gives level of project direction. ➢ Recording and reporting of field work activities/inputs made by management and by coalition partners.	➢ Quarterly reports brief and often give an incomplete view of project achievements. ➢ Quarterly reports sometimes not shared with NRI. ➢ Allowing personal criticisms to be included in reports and put in the public arena. Better to address personal issues than forward to CPHP. ➢ In-country weakness in drawing up quality written products, whether for reporting/monitoring or dissemination purposes. ➢ Only few people are tasked with reporting. ➢ Some coalition members submitted reports very late to the Team Leader.
Resource / Accounting	➢ Managing the resource flows. ➢ Funds were accounted for accordingly. ➢ Resources were always available and funds were released to coalition members at the appropriate times. ➢ Limited resources were well managed by the project. ➢ Partners worked to agreed budgets without additional demands.	➢ Resources were allocated whether or not agreed activities were completed. ➢ Delay in allowance payment. ➢ Resources not adequately distributed.Expenses allocations often mixed up. ➢ General fund allocation not commensurate with workload in some cases, since scale of work may be under-estimated. ➢ No provision for field logistics hence less active participation of farmers in adaptive research.
Monitoring	➢ Monitoring at management level was good, sanctions were imposed on those who failed to perform their duties as expected. ➢ Sanctions given to some partners who fail to live up to expectation.	➢ Monitoring at institutional level was not carried out well. ➢ Partners take sanctions as punishment by leadership. ➢ Monitoring of field staff was a bit relaxed. ➢ Supervisor/field staff linkages weak so implementation not well monitored. ➢ Monitoring was a bit weak due to lack of strong vehicles to move Team Leader and Research Co-ordinator around.
Dissemination & Promotion	➢ In first year farmers encouraged to adopt technologies of their choice.	➢ Technology brochures and DST not developed to the point of wider distribution. ➢ Failure of project to engage with movers and shakers (e.g. Regional Director) so lost opportunity for promotion.
Evaluation	➢ Steps to evaluate activities were put in place during the project implementation stage.	➢ Apparent lack of cost-effectiveness associated with roles, responsibilities and payment. ➢ Steps to evaluate activities were not well adhered to and were not done properly.
Facilitation	➢ Highly specialised very functional facilitation. ➢ Now that project operation is relying more on facilitated workshops, the progress rate has improved. ➢ Good for the training on responsiveness approach. ➢ There was understanding of topics.	➢ Sometimes expatriate voice is not heard well.

In developing the new proposal to capitalise on the Coalition's achievement with the diversity response approach, special attention was given to several of the weaknesses identified, in particular the lack of engagement with the Regional Director of Agriculture, poor 'buy-in' by Coalition members at the design stage, exclusion of outside expertise once the Coalition had been formed, the weakness in full delivery of commissioned work, difficulties with report preparation and lack of incentive for participation in meetings to take the project forward. These weaknesses were addressed in the following ways

- The new project leader would be the Regional Director of Agriculture

- The new project would be built around a series of workshops, for which Coalition members would have specific roles and be commissioned to participate, that would be used to review progress and commission new workx
- Many project activities would be open to tender by coalition members, non-coalition members or teams of both
- Full payment of fees would only occur after full delivery of commissioned work

Section F Project effectiveness

1 = completely achieved, 2 = largely achieved, 3 = partially achieved, 4 = achieved only to a very limited extent, X = too early to judge the extent of achievement, but an enormous opportunity to significantly contribute to the realisation of this goal with the new proposal.

	Rating
Project Goal National and regional crop-post harvest innovation systems respond more effectively to the needs of the poor	X
Project Purpose Livelihoods of small-holder farmers improved by the adoption of better grain storage methods	3
Project Output 1 Grain pest management options further validated by farmers for different sets of circumstances.	2
Project Output 2 A range of dissemination materials on appropriate grain storage developed and distributed.	3
Project Output 3 Knowledge relating to promotional strategies suitable to grain pest management options for smallholder farmer synthesised.	2
Project Output 4 Effective promotion of grain pest management options achieved with Coalition Partners and other key stakeholders.	2
Project Output 5 Farmers' capabilities to access select and deploy pest management technologies appropriate to their needs and resources, facilitated	3

Outputs (5 pages)
What were the research outputs achieved by the project as defined by the value of their respective OVIs? Were all the anticipated outputs achieved and if not what were the reasons? Your assessment of outputs should be presented as tables or graphs rather than lengthy writing, and provided in as quantitative a form as far as is possible.

Output 1 **Grain pest management options further validated by farmers for different sets of circumstances**

OVI. Appropriate grain storage techniques tested by 130 farmers in 15 villages of three districts by June 2004. The improved grain storage methods adopted by 180 households in 20 villages of three districts by December 2004.

Coalition partners and their field staff succeeded in working directly with 160 farmers in 15 villages covering three districts within the Northern Region (Table 6). Farmers were introduced to a range of grains storage option. Farmers chose options appropriate to their needs and were subsequently assisted in implementing these options by field staff. The success of farmer adoption was monitored by field staff and quality of grain preservation surveyed (Activity 10).

Table 6:. Districts, communities and numbers of participating farmers

District	Community/village	No. of participating farmers
Gushegu South Zone	Nyensung	4
	Shelanyili	4
Karaga Zone	Tindang	10
	Nangunkpang	10
Kpatinga Zone	Sammang	9
	Sampemo.	5
Savelugu/Nanton	Tindang	10
	Guno	12
	Chehi- Yapalsi	10
	Gbumgbum	13
Saboba/Chereponi	Gbenjag	14
	Gbangbanpong	15
Savelugu/Nanton	Moglaa	15
	Gushie	14
Gushegu/Karaga	Kpugi	15
TOTALS	**15**	**160**

Output 2 **A range of dissemination materials on appropriate grain storage developed and distributed**

OVI. Information on pest management disseminated by appropriate pathways to farmers, farmers' advisers and educational establishments by 2005.

The Coalition identified a range of promotion pathways in Northern Region for grain storage management dissemination materials (Dissemination outputs 2). However, the process of developing appropriate dissemination materials was interrupted by a realisation on the part of the Coalition that effective promotion to farmers would only be achieved if farmer diversity issues were integrated into the extension process. Nevertheless, a series of decision support trees were developed and validated and information leaflets on appropriate technologies were drafted. The further development, printing and distribution of these materials awaits the full development of an extension 'tool box', progressed under Activity 15, of which these will be an integral part. The lessons learnt from a survey of mud silo use

and promotion were developed into an extension leaflet that was distributed key contacts (Annex IV).

Output 3 **Knowledge relating to promotional strategies suitable to grain pest management options for smallholder farmer synthesised**

OVI. Promotional strategies for no less than six storage management options identified, from different sources (e.g. storage literature, MoFA in house expertise, voluntary in-house expertise), appraised, and incorporated into synthesis by end of October 2004

The new learning achieved by the Coalition lead away from the synthesis of promotional strategies for specific storage options, at this stage, but instead resulted in an understanding that a prerequisite to successful promotion with farmers in northern Ghana is to develop methods of taking into account farmer diversity that can underlie individual promotion strategies. This 'diversity approach' is explicit in MoFA's own extension policies. The project's own strategy towards this was developed at a specially convened diversity workshop that lead to a training programme at which 15 people learnt to implement basic diversity approaches.

Output 4 **Effective promotion of grain pest management options achieved with Coalition Partners and other key stakeholders**

OVI 1 Decision support tree developed and actively used by farmers and farmers' advisors by December 2005.
OVI 2. Farmers' advisors and extension services given training and information resources to continue promotion.
OVI 3. Participating extension staff of MoFA (50) and of the participating NGOs (14) trained by October 2004.
OVI 4. Two district directors outside the scope of the project request training in grain storage management options for 50 staff by October 2004.

Grain pest management options have been promoted with Coalition partner representatives and their field staff, who have been trained in their application and promotion. Activities in 15 communities have raised the profile of grain storage options, both with the partners and with the communities they serve, and the learning alliance approach has resulted in a new understanding of what should be done in order to achieve effective extension of post-harvest technologies to farmers. The success of the new approach can be judged by a request to the Coalition from the FARMER project, based in MoFA, for training in the diversity response approach in 2005 for agricultural staff in the three northern regions of Ghana (Annex V)

Output 5 **Farmers' capabilities to access select and deploy pest management technologies appropriate to their needs and resources, facilitated**

OVI 1. Fifty AEAs report requesting information on grain management options.
OVI 2 AEAs at 10 locations report on the use of a decision support tree in advising farmers on storage technology options
OVI 3. Farmer household diversity training for 25 stakeholders to understand farmer problems, wealth status, what is important to the farmer as regards storage, cropping and other livelihoods.

The change in direction of the project has meant that OVIs 1 and 2 have not been met. However, in anticipation of this an additional OVI 3 was generated. Fifteen stakeholders have

received diversity training and form the core from which it will be possible to implement farmer centred extension of appropriate grain storage options.

Purpose (2 pages) - Livelihoods of small-holder farmers improved by the adoption of better grain storage methods

Based on the values of your purpose level OVIs, to what extent was the purpose achieved? In other words, to what degree have partners/other users adopted the research outputs or have the results of the research been validated as potentially effective at farmer/processor/trader level?

OVI Grain losses in northern Ghana reduced and grain quality improved in 50 villages (about 1000 households) by December 2005 and more widely in the Region by 2008.

The direct effects of the project have been felt in 15 villages and to the immediate benefit of 160 farmers. In the process of doing this, the project unearthed a fundamental flaw in the current operation of the extension system which prevented poorer farmers in these communities from receiving advice tailored to their needs. It was clear that this should be addressed before appropriate grain storage options could be promoted. The research outputs of the project are now considerably different from those proposed at the start, in particular the development of the diversity response approach, so the existing OVI is of limited relevance. The desire for the uptake of the new outputs has been articulated by the FARMER project in MoFA (funded by CIDA). The achievements of the project are considerable in moving the promotion of post-harvest technologies a significant and essential step towards the original purpose.

Goal (1 page)

What is the expected contribution of outputs to Project Goal - 'National and regional crop-post harvest innovation systems respond more effectively to the needs of the poor' ?

In northern Ghana the Coalition members are key players in the innovation system and they have now been re-orientated to address the needs of the poor within the communities in which they work. They now understand the diversity objectives expressed within MoFA's own extension policy and are now in a position to start implementing this in their own work. In the longer-term, there are clear indications that MoFA considers this to be a priority for their staff in the three regions of northern Ghana (as evidence by the request for training in this area). This training is expected to be funded by the FARMER Project (CIDA) and be implemented by Coalition partners. If additional work on the diversity approach is supported by CPHP in 2005 then this will be further developed into a more discrete 'tool box' that can be applied not only in northern Ghana but will have a much wider application in sub-Saharan Africa.

Section G – Uptake and Impact (2 pages)

Organisational Uptake (max 100 words)

What do you know about the uptake of research outputs by other intermediary institutions or projects (local, national, regional or international)? What uptake by which institutions/projects where? Give details and information sources (Who?What?Howmany?Where?)

There is planned uptake of the diversity response approach by the MoFA FARMER project. Current proposal for training agricultural staff are six courses in 2005 in three northern regions, training a total of 84 staff (see Appendix V). Coalition members led by MoFA, Tamale are also expected to continue promotion of the diversity approach and RTB amongst regional and district directors of agriculture in these three northern regions and wider afield. The private

sector training organisation, GDCA, has expressed interest in further refining the methodology and promoting it in its training courses.

End user uptake (max 100 words)
What do you know about the uptake of research outputs by end-users? Which end-users, how many and where? Give details and information sources

A total of about 160 farmers in 15 localities in 3 districts of Northern Region have been involved in the validation of storage technologies through adaptive trials. This was done through farmer assessment and evaluation at farmer meetings. Some Coalition core partners have reported their organisations using some of the project outputs in training their farmers. OIC, Tamale have used knowledge acquired from project on solarisation, farmer diversity and mud silo in training their farmers and traders in Northern Ghana.

Knowledge (max 100 words)
What do you know about the impact of the project on the stock of knowledge? What is the new knowledge? How significant is it? What is the evidence for this judgement?

New knowledge includes recommendations on approaches to the extension of mud silos in Northern Ghana as well as mud silo usage with regard to commodity, materials and gender (Dissemination outputs 1&3). Also of importance are the lessons on farmer diversity through exploration of farmer situations in the field. Prior to the project there were no diversity tools readily available to extension workers, and there are now 15 appropriately trained extension workers. Despite exemplary extension policy objectives, there is a knowledge gap as to how these objectives might be operationalised. The DRA and associated RTB tool plug this gapd.

Institutional (max 100 words)
What do you know about the impact on institutional capacity? What impact on which institutions and where? What change did it make to the organisations (more on intermediate organisations). Give details and information sources.

The institutional impact of the project has been considerable. The coalition approach has created a method of working not previously experience by the Coalition partners. Working together has significantly increased institutional capacity as the individual organisations no longer expect to approach post-harvest problems in a vacuum but are prepared to work as a team. A number of obstacles had to be overcome to arrive at this position and as a result of the deliberations during the course of the project a solid practical means of operation was developed that is now the basis of the Coalition's proposal for a new CPHP project.

Policy (max 100 words)
What do you know about any impact on policy, law or regulations? What impact and where? Give details and information sources

This project has taken account of the Ministry of Food and Agriculture's extension policy objectives and developed an approach (DRA) and operational tool (RTB) for implementing many elements of this otherwise exemplary policy. The project has made formal contact with the Minister of Agriculture to explain its objectives and await formal endorsement that should lead to constructive interchange on policy implementation and development.

Poverty and livelihoods (max 100 words)
What do you know about any impact on poverty or poor people and livelihoods? What impact on how many people where? Give details and information sources.

Not all the technical PH options promoted for farmers meet the needs of all groups. In particular, it has been relatively easy for the project to work with farmers producing a surplus but poorer farmers have missed. Lesson learning from this issue has enabled the project to refocus its efforts so that in future PH information sharing within communities can be undertaken in line with government policy which is to ensure equity in the distribution of the benefits from development, to impove rural livelihoods, and to reduce poverty especially among rural women, the youth and the physically challenged.

Environment (max 100 words)
What do you know about any impact on the environment? What impact and where? Give details and information sources.

No impact of the project activities on the environment.

Endorsement by the Core Partners:

Mr F.H Andan (MoFA) .....……. Date
Project Leader

Mr S. Bariyam (OICT) ……. Date

Dr J. Bediako (UDS) …….. Date

Dr R.J. Hodges (NRI) ……. Date

Mr M.J. Morris (NRI) ……. Date

Mr S. Stevenson (CAPSARD) …….. Date

Mr N. Sukhla (CARD) …….. Date

ANNEXES

I Copies of the stakeholder, gender, livelihoods and environmental form included with the concept note.
II Project Logical Framework
III Tabulated description of disseminated outputs (including all published, unpublished and data sets)
IV Key contacts list and distribution plan for project reports
V Training proposals for funding by FARMER Project

ANNEX 1

LIVELIHOODS ANALYSIS

1. Which interest group(s) is your work intended to benefit and where are they?

Subsistence farmers in northern Ghana who store cereals and/or cowpea

2. In what way can they be defined as 'poor'? State your source(s).

In Ghana, the patterns of poverty differ between regions and agro-ecological zones, with the Northern, Upper West and Upper East Regions recording the greatest and most extreme form of poverty according to the 1998-99 Ghana Living Standards Survey (GLSS), which defines poverty using an economic index (Ghana Statistical Service, 1999). This regional differentia is endorsed by the World Bank commissioned 'Consultations with the Poor' (CWTP), which poor natural resource endowments and productivity in the northern savannah region with drawing the least investment in human development terms. Moreover, the CWTP identifies downward trend in living conditions over the past decade with increasing poverty and hardship worst amongst rural households tied to food crop production (Kunfaa, 1999).

In these rural areas, environmental vulnerability is a key livelihoods issue; erosion of the natural resource base is compounded by poor health, limited diversification options due to lack of education, and limited access to social networks (Ashong and Smith, 2001). Low yields and food insufficiency amongst the poor and their dearth of assets oblige many to engage in nor specialist labour (on- and off-farm) and the Use of off-farm natural resources to offset food deficits. Women for example engage in shearnut picking and processing, pito brewing, fire wood collection and petty trading. Men may engage in hunting and fishing and hire themselves out as labour in urban areas (CIDA, 1999). Such activities do not however assure strategic improvements and carry their own risks.

Seasonal hardship associated with declining food stocks and lack of cash is worst in the period February to July, when many households are forced into coping modes (e.g. out-migration b male youths, liquidation of assets including land, livestock and personal effects. Coping-like livelihood strategies are typically gendered and differ to other identities (e.g. age, wealth group, sex of household head).

The aggregation of these behavioural patterns amount to widespread processes of social change in the lives of rural people, manifesting themselves as changes in occupation, an income-earning reorientation, changing social identities, and demographic shifts (Bryceson, 2000). Subsistence production still provides a safety net for the majority of rural households however lack of access to agricultural extension, health and education services contribute directly or indirectly to food insecurity. Opinion as to the role of traditional and religious practice is divided; some argue they are key to facilitating interaction between people and providing physical and spiritual services (Ashong and Smith, 2001), others hint that they may inhibit development (CIDA, 1999).

Ardayfio-Schandorf, E. and Sowa, N.K. 1996. Gender and Poverty in Ghana, Final Draft Submitted to the World Bank. As cited by Ashong, K. and David Rider Smith (2001).

Ashong, K. and Rider Smith, D. 2001. Livelihoods of the Poor in Ghana: A contextual Review Ghana-wide Definitions and Trends of Poverty and the Poor with those of Peri-Urban Kumasi, Natural Resources Institute, Chatham. http://www.Iivelihoods.org/info/docs/SLGhana.rtf

Bryceson, D. 2000. Rural Africa at the crossroads: Livelihood practices and policies, ODi Nah Resource Perspectives, Number 52, April 2000.

CIDA, 1999. CIDA Food Security Strategy for Northern Ghana: 1999/00 to 2004/5, Working Document, CIDA.

Ghana Statistical Service, 1999. Poverty Trends in Ghana in the 1990s, Prepared by the Government of Ghana for the 1 D'h Consultative Group Meeting, Accra, Ghana, 23rd-24t November.

International Development Association and the International Monetary Fund 2002. Ghana: Joi assessment if the PRSP Preparation Status Report, prepared by the staffs of the IDA and the IMF: http://poverty.worldba n k. org/files/Ghana_JSA_of_PRSP_Preparation_Status Re port. p
Kunfaa E. Y., 1999. 'Consultations with the Poor', Ghana Country Synthesis Report, Centre for the Development of People (CEDEP), Kumasi, Ghana. Report commissioned by the World Bank. Accra: The World Bank; as cited in Ashong, K. and David Rider Smith (2001).

3. What livelihood problem or opportunity are they experiencing and how many people are affected? State your evidence.

In northern Ghana, small-holder farmers face a challenge maintaining grain stocks free of insect infestation to guard their food security and to retain grain quality long enough to allow entry into the market later in the storage season when prices are higher. Post-harvest storage losses d~ to pests and diseases have been estimated to range from 30°/O for grain crops up to 70°/O for perishable produce (CIDA, 1999).

The cereal grains to be considered are maize and, for some communities, sorghum; cowpeas will also be included. Maize is becoming an ever more important crop in sub-Saharan Africa with demand increasing by 93°/O from 27 million tonnes in 1995 to 52 million tonnes in 2020. In Ghana's Northern Region, the area of cowpea Under cultivation is estimated to be 50,000 ha., with a total yield of 35,929 MT and average yield of 0.74 MT/ha recorded. For poorer households it provides a needed source of non-animal protein.

It is estimated that 50°/O of the people in the rural savannah (which includes Northern Region) live in extreme poverty (Ghana Statistical Service, 1999). The rural population of the Northern Region is a little over one million people.

4. What contribution will your work make to this, over the timeframe of the project?

By 2005, grain losses reduced and good grain quality maintained so that household food security and rural livelihoods are improved for the target groups. By the application of the type of improved storage option offered in this project, farmers couId expect to see their losses reduced by at least 50% and an ability to store for longer into the lean season. This will ensure that there is food for consumption longer and/or food for sale at a premium price.

The incorporation of the LGB risk warning system into the project will ensure that farmers are taken by surprise when there is a ‘bad’ year (as there was in 2000/2001 as evidenced by the very large numbers of complaints received by MoFA) that can cause exceptional maize losses

5- What external factors need to be in place for impacts to be sustained and extended after the project has ended?

The capabilities, resources and motivations of intermediate agencies (i.e. target organisations involved in the promotion of the technologies (including the knowledge components e.g. decision-making mechanisms) are maintained at a sufficient level.

Commodity prices are sufficiently high to allow farmers to pursue pest management option~ the protection of grain stocks.

6. What other initiatives (research or development) would your project complement value to?

The NGO OICT is actively engaged in post-harvest development and the proposed project v dovetail with its efforts in this area and strengthen its capabilities. There is also a donor project (TechnoServe) planned for improving food security by upgrading farmer/trader storage, largely through training, in northern Ghana. The materials and approaches to be developed by the CPHP project could add substantial value to the TechnoServe project which could act as an important additional promotion pathway.

7. **On what basis was the work that you propose identified?**

The Minister of Food and Agriculture has stated that the implementation of effective food g storage is an important priority for Ghanaian agriculture.

Recent project workshop in Northern Region has identified Larger Grain Borer infestation of maize stocks as a continuing serious problem and research priority.

Survey work undertaken in northern Ghana (Brice et a/. 1996: Golob et a/. 1998)

Brice J., Moss C., Marsland N, Stevenson S., Fuseini H., Bediako J., Gbetroe H., Yeboah R Ayuba I. 1996. Post-harvest constraints and opportunities in cereal and legume production systems in cereal and legume production systems in northern Ghana. Natural Resources Institute, typewritten pp. 85

Golob P., Stringfellow R. and Asante E.O. A review of the storage and marketing systems o major food grains in northern Ghana. Natural Resources Institute report, typewritten pp. 64

Morris, M. and B. Tran (2002), Improvements in the Storage and Marketing Quality of Legumes (Phase II), DFID Renewable Natural Resources Research Strategy Crop Post Harvest Programme, Final Technical Report R7442. Natural Resources Institute, Chatham.

8. Who stands to lose from your work, if it is adopted/ implemented on a large scale?

There are no obvious losers in this project. Farmers' incomes and food security will be enhanced and traders will have access to more and higher quality produce so improving the market.

GENDER ANALYSIS

1. How does the research problem/opportunity that you have identified affect | men and women differently?

The research hypothesis links livelihood improvements to farmers being able to select those improved grain storage methods that better meet their individual needs. Men and women, even from similarly wealth-ranked households engage in different livelihood and coping strategies. Moreover, the situation of women generally will be case specific and can be very diverse. The respective strengths and needs of a female head of household with many dependants, a first wife with good access to labour and land, and an elderly widow (say with access to land but not labour) will differ significantly.

Not only do men and women undertake different and changing strategies over time (e.g. women and girl children are often first to engage in coping activities when households are under stress) their access to and nature of information sources are typically different, as too is their ability to access or call upon services. This project will take account of these key differences in its efforts to interact with and provide diverse farmers with a basket of options and mechanisms to select appropriate technologies.

The project will seek to target those poor individuals, households and groups for whom the validated storage technologies might be most effective in improving their food security. This will include both men and women, but earlier studies suggest that women may constitute a great proportion of the target poverty groups. In some ethnic groups in northern Ghana grain storage is the preserve of males, elsewhere it involves men and women who may share their responsibilities, or manage separate stores. These socio-cultural aspects will be taken into account.

2. How will your expected results impact differently on women and men?

As above this will be location specific, depending on culture and ethnicity, community institutional arrangements, household status and structure, and other social identities.

Differences in impact will also be determined by institutional environments associated with the collaborating target organisations involved in promoting the findings.

To expiate the more familiar gender-biases we will actively involve staff from the Women in Agricultural Development (WIAD) Department of MoFA and those gender initiatives incorporated in collaborating agencies.

3. What barriers exist to men's and women's involvement in project design, implementation and management decisions?

Prevailing social and institutional environments mean that very few women occupy senior posts in state agricultural or research services. The situation is a little better amongst NGOs. While these poor levels of representation are inevitably reflected in the coalition membership, they have also served to galvanise our efforts in seeking where and whenever possible to address the issues that arise from this bias in the project processes. Poorer women are expected to constitute the largest group of beneficiaries, underpinning the need to keep these concerns centre stage. 1

STAKEHOLDER ANALYSIS

Stage 1: Stakeholder interests and influence

Table 1a: Coalition members - interests and impact

Proposed coalition members	**Key interests in the project**	**Potential impact of the project**
Ministry of Food and Agriculture	Strengthening ability to support small-holder agriculture	Gain a much better approach to small holder storage.
OICT	Helping farmer groups	Strengthened post-harvest capability and benefit to farmer groups
CARD	Helping farmer groups	Strengthened post-harvest capability and benefit to farmer groups
CAPSARD	Using experience of botanical pesticides	Higher profile for organisation
NRI	Promotion of previous project outputs	New approaches that can be applied regionally, better institutional image
University of Development Studies	Using experience of social sciences in local context	Higher profile for organisation
Selected farmers	Beneficiary of improved grain storage	Improved food security and better options for improving farm incomes
OICT	Advise on approach and relevance	Have farmer groups to work with
Selected farmers		Have experience and can articulate demand

Implementation and Monitoring	MoFA	Day to day administration technical and logistical support l	Permanent presence in NR and good linkages to regional authorities
	NRI	Specialist inputs on social and natural sciences, back stopping and QC for outputs, financial management.	Standing expertise in post-harvest Science and very close knowledge of technology to be promoted
	University of Development Studies	Survey work, development of decision support framework and advice on methods and materials for promotion	Deep local knowledge of social issues and cultural practices
		Implement promotion of storage technologies	
	CARD	Implement promotion of storage technologies	Have farmer groups to work with.
	OICT	Provide expertise on botanical pesticides	Have farmer groups to work with.
	CAPSARD		Have farmer groups to work with and have previous experience working with botanicals
Evaluation	MoFA	Collection of field data, participation in workshops, preparation of reports	Have a central role the project and sufficient staff to gather data
	NRI	Participation in workshops and	Have a central role the project preparation of reports
	University of Development Studies	Collection of field data, participation in workshop, preparation of reports	Have a central role the project
		Participation in workshops	Can contribute data and opinions
	OICT	Participation in Workshops	Can contribute data and opinions

ANNEX II

PROJECT LOGFRAME

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Risks
Goal			
National and regional 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 validated in four regions.	Project evaluation reports. Partners' reports. Regional Coordinators' Annual Reports. CPHP Annual Reports. CPHP Review 2005.	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.
Purpose	**Objectively Verifiable Indicators**	**Means of Verification**	**Risks**
1. Livelihoods of small-holder farmers improved by the adoption of better grain storage methods.	1. Grain losses in northern Ghana reduced and grain quality improved in 50 villages (about 1000 households) by December 2005 and more widely in the Region by 2008.	1.1 MoFA annual reports 1.2 NGO reports 1.3 Farm incomes from grain sales 1.4 Traders reports on access to acceptable quality grain	1. MoFA extension services, NGOs and educational establishments able and willing to adopt and promote outputs during and beyond the life of the project. Livelihood analysis provides accurate identification of researchable constraints or opportunities that lead to poverty reduction.
Outputs			
1. Grain pest management options further validated by farmers for different sets of circumstances.	1. Appropriate grain storage techniques tested by 130 farmers in 15 villages of three districts by June 2004. The improved grain storage methods adopted by 180 households in 20 villages of three districts by December by 2004.	1.1 Project reports 1.2 MoFA annual reports 2.1 Printed materials 2.2 Media coverage 2.3 School curriculum	1, 3, 4. Commodity prices are sufficiently high for farmers to invest in better pest management to protect grain stocks. 1, 3, 4. Weather is good enough for surplus grain production and hence need for grain storage.

2. A range of dissemination materials on appropriate grain storage developed and distributed. 3. Knowledge relating to promotional strategies suitable to grain pest management options for small-holder farmer synthesised 4. Effective promotion of grain pest management options achieved with Coalition Partners and other key stakeholders. 5. Farmers' capabilities to access select and deploy pest management technologies appropriate to their needs and resources, facilitated.	2. Information on pest management disseminated by appropriate pathways to farmers, farmers' advisers and educational establishments by 2005. 3. Promotional strategies for no less than six storage management options identified, from different sources (e.g. storage literature, MoFA in house expertise, voluntary in-house expertise), appraised, and incorporated into synthesis by end of October 2004 4a. Decision support tree developed and actively used by farmers' and farmers advisors by December 2005. 4b.Farmers' advisors and extension services given training and information resources to continue promotion. 4c.Participating extension staff of MoFA (50) and of the participating NGOs (14) trained by October 2004. 4d. Two district directors outside the scope of the project request training in grain storage management options for 50 staff by October 2004. 5a. Fifty AEAs report requesting information on grain management options. 5b. AEAs at 10 locations report on the use of a decision support tree in advising farmers on storage technology options.	reports 3.1 Survey of improved practice by farmers, extension services and NGOs 3.2 Project reports 3.3 NGO reports 3.4 MoFA reports 4.1 Printed decision support tree available. 4.2 Availability and understanding of decision support tree among farmers' advisors. 4.3 Project reports	3, 4. Farmers unwilling or unable to contribute to development of 'decision support tree' or to adopt improved practice. 2, 3. Intermediate agencies (e.g. target organisations) fail to effectively promote technical strategies amongst deserving farmers.

Activities	Objectively Verifiable Indicators	Means of Verification	Risks
Year 1 1. Co-ordination workshop held with Coalition Partners and farmers' representatives. 2. Training programme for all field staff. 3. Stakeholder meetings in target areas. 4. Implement LGB risk monitoring. 5. Clarify reasons success /failure of mud silo adoption. 6. Create linkages to exploit the effective promotion pathways (with schools etc). *Year 2* 7. Participatory development of draft promotional materials on proven grain storage technologies. 8. Field staff to promote grain storage technologies with identified farmer groups. 9. Implement improved storage with selected farmers. 10. Participatory evaluation of implementation of storage options. 11. Review strategy for promotion of grain protection technologies. 12. Workshop to revise promotional strategy and plan 3rd year *Year 3* 13. Development of promotion materials. 14. Update and upgrade decision support tree. 15. Field staff trained in using the extension 'tool box' to ensure equitable balance of poorer groups and gender in promotion of technology options. 16. Preparation and distribution of promotion and publicity materials. 17. Preparation and implementation of second storage season promotion. 18. Promotion workshop and planning for beyond end of project. 19. Prepare PFR.	**NB Numbering of activities not linked to outputs as several activities feed into more than one output, see Section 25.**		1. to 19. 1. A stable political and enabling environment will exist throughout the life of the project.

ANNEX III

TABULATED DESCRIPTION OF DISSEMINATED OUTPUTS

Output no.	Reference Type (as in NRIL green citation guidelines)	Citation Details	YES/NO**
1	Internal report	BEDIAKO, J.A., NKEGBE, P. and IDDRISU, A. (2004). Establishing the future potential for the use of mud silos by smallholder farmers: an assessment of mud silo promotion in the Northern Region of Ghana. DFID Crop Post-harvest Programme Project R8265. University of Development Studies, Tamale, Northern Region , Ghana. pp. 33.	No
2	Workshop report	MORRIS, M., ANDAN, F.H., ADDO, S., BEDIAKO, J., BARIYAM, S., HODGES, R. (2004) Reviewing Progress: Proceedings of a Workshop organised by MoFA in Coalition with OICT, CAPSARD, CARD, UDS and NRI (UK). Ministry of Food and Agriculture, Tamale, Northern Region, Ghana, 17 & 18 March 2004 [2-day workshop, 20 participants]	Yes
3	Training course report	ANDAN, F.H. and ADDO, S. (2003). Training for field staff on grain management options and the use of the farmer decision support tree. MoFA Conference Room, Tamale, Ghana. 25 - 27 March 2003. 15pp.	No
4	Internal report	CPHP Farm Storage Project R8265/ZB0335. Minutes of meetings. August 2003 - January 2004. 19pp.	No
5	Internal report	MORRIS, M. (2003) Visit to Tamale by the social development advisor to confer with coalition members - notably the project leader, research coordinator and social scientist - assess and contribute to progress; 7th – 20th June 2003. Natural Resources Institute, Chatham, UK.	Yes
6	Internal report	MORRIS, M. (2003), Recommended actions for the managing team. Natural Resources Institute, Chatham, UK. 19 pp.	Yes
7	Internal report	HODGES, R. (2003) Visit to Tamale by the technical advisor to participate in the coalition quarterly meeting and provide technical advice on project activities; 7th – 20th September 2003. Natural Resources Institute, Chatham, UK.	Yes

8	Internal report	MORRIS, M (2003), Farmer decision-making: Discourse 1 – Mike Morris, 21 March 2003. Natural Resources Institute, Chatham, UK. 3 pp.	No
9	Internal report	MORRIS, M (2003), Farmer decision-making: Discourse 2 – Mike Morris, 4 April 2003. Natural Resources Institute, Chatham, UK. 7 pp.	No
10	Workshop report	MORRIS, M., ANDAN, F.H., ADDO, S., HODGES, R., BEDIAKO, J., BARIYAM, S., and STEVENSON S. (2004), Responding to Diversity. A report on the deliberations of coalition members - MoFA, OICT, CAPSARD, CARD, UDS & NRI (UK) - and associated field staff, during an extended workshop held between 21 - 26 June, 2004, at MoFA and Tampe-Kukuo village, Tamale, Northern Region. Ministry of Food and Agriculture, Tamale, Ghana. 31pp. [4-day workshop, 20 people]	Yes
11	Workshop report	MORRIS, M., ANDAN, F.H., ADDO, S., HODGES, R. (2004) Learning from Experience. A report on the deliberations of coalition members - MoFA, OICT, CAPSARD, CARD, UDS & NRI (UK). Ministry of Food and Agriculture, Tamale, Northern Region, Ghana, 16-18 November, 2004 [3-day workshop, 20 participants]	No
12	Training workshop report	ABDEL-RAHMAN O. and ZAKARIA A-R. (2004) Diversity Response Approach. Proceedings of a development and training workshop organised by the Ghana Danish Community Association for coalition member staff - OICT, CARD, CAPSARD and UDS. Dalun village, Tamale, Northern Region, Ghana, 13th - 17th October, 2004. (3-days, 15 participants).	No
13	Information leaflet	ANONYMOUS (2004) Ensuring better promotion of mud silos in northern Ghana. Ministry of Food and Agriculture, Tamale, Ghana. 40 copies, 2 pp.	No
14	Internal report	ANONYMOUS (2004) Decision Support Trees to Find Appropriate Storage Options for Small-holder Farmers in Northern Ghana. DFID Crop Post-harvest Programme Project R8265. Ministry of Food and Agriculture, Tamale, Ghana, pp. 8.	No

*** Please state whether the dissemination output has previously been reported (e.g. as "submitted to journal or "in press")*

ANNEX IV

KEY CONTACTS LIST AND REPORT DISTRIBUTION

(1) Regional Directors of MOFA

- Northern (Mr Sylvester Adongo, MoFA, PO Box 950, Tamale, Ghana)
- Upper East
- Upper West

(2) District Directors of MOFA (Northern Region)

- Tamale
- Savelugu/Nanton
- Tolon/Kumbungu
- East Gonja
- Nanumba
- Yendi
- Zabzugu/Tatale
- Saboba/Chereponi
- Gushegu/Karaga
- East Mamprusi
- West Mamprusi
- West Gonja
- Bole

(3) Directors/Project/Programme Coordinators

- Opportunities Industrialisation Centres Tamale OICT (Mr Solomon Bariyam, OICT, PO Box 1186, Tamale, Northern Region, Ghana)
- Savannah Agricultural research Institute (SARI)
- Canadian International Development Agency (CIDA)
- Ghana Danish Community Association GDCA (Mr Osman Abdel-Rahman, GDCA, PO Box ER 362, Education ridge, Tamale, Northern Region, Ghana)
- Northern Ghana Network for Development NGND (Abdul-Rashid Zakaria, NGND,
- Participatory Development Associates (PDA, Ms S. Tobin)
- FARMER Project (Mr D. Scheer)
- Association of Church Development Projects (ACDEP)
- Centre for Agricultural and Rural Development CARD (Naresh Schukla, CARD, PO Box 1504, Tamale, Northern Region, Ghana)
- Community Action Programme for sustainable and Rural development CAPSARD (Sulemana Stevenson, CAPSARD, PO Box ER 87, Tamale, Northern Region, Ghana)

(4) Universities

Departments of Extension

- University of Ghana (Legon)
- University for Development Studies (Dr Joyce Bediaku, University for Development Studies, PO Box 1350, Tamale, Northern region, Ghana)
- University of Science & Technology (Kumasi)
- University of Cape Coast (Cape Coast)
- University College of Winneba (Winneba)

Reports

1. Reviewing Progress
2. Responding to Diversity,
3. Learning from Experience,
4. Diversity Response Approach.
5. Establishing the Future Potential for the Use of Mud Silos by Small-holder Farmers
6. Decision Support Trees to Find Appropriate Storage Options for Small-holder farmers
7. Ensuring Better Promotion of Mud Silos in Northern Ghana (leaflet)

Organisation/Report no.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Regional Agric. Director - NR	X	X	X	X	X	X	X
Regional Agric. Director – UE				X		X	X
Regional Agric. Director – UW				X		X	X
District Director - Tamale				X			X
District Director -Savelugu/Nanton				X			X
District Director -Tolon/Kumbungu				X			X
District Director –East Gonja				X			X
District Director -Nanumba				X			X
District Director -Yendi				X			X
District Director -Zabzugu/Tatale				X			X
District Director -Saboba/Chereponi				X			X
District Director -Gushegu/Karaga				X			X
District Director –East Mamprusi				X			X
District Director -West Mamprusi				X			X
District Director -West Gonja				X			X
District Director -Bole				X			X
FARMER		X		X		X	X
SARI				X	X	X	X
CIDA				X			X
GDCA		X		X			
NGND		X		X			
PDA		X		X			
OICT	X	X	X	X	X	X	X
CARD	X	X	X	X	X	X	X
CAPSARD	X	X	X	X	X	X	X
U. of Development Studies	X	X	X	X	X	X	X
U. of Ghana				X			
U. of Science and Technology				X			
U. of Cape Coast				X			
U. of Winneba				X			

X = to be sent

ANNEX V

Training proposals for funding by FARMER Project

FARMER SUB-PROJECT

CONTRIBUTION AGREEMENT

Contribution Agreement Number *{number}*

Between

Ministry of Food and Agriculture (MoFA),
Tamale, Northern Region,
Ghana

and

PARTNERS in Rural Development
323 Chapel Street
Ottawa Canada
K1N 7Z2
(lead agency of the Canadian Coordinating Agency for the
FARMER project, hereinafter referred to as the CCA)

FARMER PROJECT CONTRIBUTION AGREEMENT

APPENDIX B – FARMER SUB-PROJECT DESCRIPTION

'Training for transformation: the diversity response approach'

1. Background and Context

MoFA, working in conjunction with several local NGOs and advisors from the UK Natural Resources Institute (NRI), currently provides the lead on the 'Farm storage project[12]', which seeks to effect improvements in the household food security of smallholder farmers in northern Ghana (project purpose), and ultimately to contribute to making national and regional crop-post harvest innovation systems more responsive to the needs of the poor (project goal). This work, which is due to end in December 2004, is funded by the Crop Post Harvest Programme (CPHP) of the UK Department for International Development.

The farm storage project was also intended to increase the impact of the CPHP funded body of research undertaken in northern Ghana by MoFA and NRI, over the previous 10 years. This earlier body of research focused on developing technical solutions to specific post-harvest (PH) pest/crop-related problems, and paid less attention to distinguishing between the needs and priorities of different farmers, or to understanding delivery system constraints. Either or both of which could - and do - undermine development impact.

MoFA's current extension policy is unambiguously supportive of more demand-led and client-focused extension services (MoFA, 2002). The farm storage project has however revealed some of the limitations of current post-harvest - and other - extension service provision (state and voluntary), which may be characterised as adopting a one-size-fits-all approach to technology transfer, with the knock-on effect that the needs and priorities of many, and particularly poorer farmers, are not being adequately met under the current regimes. Current policy is excellent but much work is still required on implementation strategies, if equity is to be ensured in the distribution of benefits from development, rural livelihoods improved, and poverty reduced13.

Having identified this weakness in PH provision, the project set about developing both an approach and the associated tools to help service providers better understand and respond to the diverse needs of the rural client base. This challenge was perceived not simply in terms of devising the means and tools to recognise 'diversity' - extracting it like juice from an orange - but rather in terms of learning from farmers and working with them in a responsive way. To this end a series of workshops and field visits were commissioned and undertaken, from which a diversity response approach (DRA) has emerged, which includes a 'responsiveness' tool box (RTB). The product is essentially a training tool. Although its participatory development was with post-harvest matters in mind, it has general application. The farm storage project is currently refining the DRA and RTB, specifically drafting the guidelines for their use as training tools to make service providers more responsive to the needs of diverse farmers and farming households.

In parallel to seeking the support of the FARMER project to help effect a more farmer-centred, responsive approach by service providers in northern Ghana, the collaborating organisations have been invited by the CPHP to submit a further project proposal, which amongst other things will explore how the capacities of diverse farmers and farmer groups for seeking and using post-harvest information, can be improved implement. These two initiatives are intended to be complementary and reinforcing in the realisation of implementation strategies for government extension policies.

MoFA (2002), Agricultural Extension Policy. Directorate of Agricultural Extension Services, Ministry of Food and Agriculture, June 2003 booklet, Accra. 26 pp.

MORRIS, M., ANDAN, F.H., ADDO, S., BEDIAKO, J., BARIYAM, S., HODGES, R. (2004a) Review Workshop: Proceedings of a workshop organised by MoFA in coalition with OICT, CAPSARD, CARD, UDS and NRI

[12] The full name of the project is: 'Improving household food security by widening the access of small-holder farmers to appropriate grain store pest management'.

[13] "..especially among rural woman, the youth and the physically challenged" (MoFA, 2002).

(UK) and held on March 17th and 18th, 2004, at MoFA, Tamale, Northern Region. Ministry of Food and Agriculture, Tamale, Ghana. 37 pp.

MORRIS, M., ANDAN, F.H., ADDO, S., and HODGES, R. (2004b) Responding to Diversity: A report on the deliberations of coalition members - MoFA, OICT, CAPSARD, CARD, UDS & NRI (UK) - and associated field staff, during an extended workshop held between 21 - 26 June, 2004, at MoFA and Tampe-Kukuo village, Tamale, Northern Region. Ministry of Food and Agriculture, Tamale, Ghana. 31pp.

ABDEL-RAHMAN, O. and ABDUL-RASHID, Z (2004) (in preparation) Report on the exercise to develop a responsiveness methodology and tools for service providers, with particular focus on crop post-harvest activities.

2. Purpose and Expected Results

The goal of the proposed sub-project, *Training for transformation: the diversity response approach*, is to effect improvements in the household food security of smallholder farmers in northern Ghana. This is to be achieved however through addressing weaknesses in the current service provision delivery system.

The purpose of the sub-project is thus to consolidate understanding amongst key district level extension staff – state and voluntary/private sector - throughout the three northern regions, of MoFA's agricultural extension policy, particularly with respect to the promotion of 'farmer-driven extension and research to ensure that services provided are relevant to farmers' needs' (Policy i., MoFA, 2002).

To realise this purpose it is anticipated that the sub-project will deliver the following results: Key players - a minimum of 50 - with responsibilities for meeting farmers' post-harvest information requirements, in each of the 25 districts, will have gained understanding and been trained in an approach and the use of appropriate tools, that will enable them to facilitate the provision of post-harvest services in their respective domains which are both more inclusive and more responsive to the needs and priorities of their diverse farmer clients. Output indicators would include a greater diversity of farmers (by number, 'wealth group', sex and age) interfacing with extension staff, receiving post-harvest advice better tailored to their respective circumstances, needs and priorities, in each of the districts.

The sub-project primarily addresses institutional constraints, and as such will contribute to institutional development and sustainability. It also explicitly seeks to establish a more equitable focus in the delivery of extension services, with the longer term purpose of improving household food security for all smallholder farmers, but particularly resource-poor farmers whose realistic needs are not being addressed by the system. The aim is therefore to underpin both economic and social developments. Technical aspect of the training will include the promotion of 'safer' technologies, in terms of both ecological and human health considerations (e.g. alternative treatments to organo-phosphate based grain protectants). This realistically would constitute the first order of environmental impact.

3. FARMER Outcomes and Outputs supported by the Sub-Project

The sub-project will contribute in part to the achievement of the following expected project outputs:

1. Improved partnerships, linkages and mechanisms for technology development, transfer and utilization.

The training will develop and/or reinforce linkages between district level knowledge managers, public sector researchers and private sector trainers. Moreover the development of the diversity response approach (DRA) is expressly in response to improving the appropriateness of mechanisms for technology development, transfer and utilization.

2. Strengthened formal and informal, farmer-driven agricultural extension services.

This is the explicit purpose of the sub-project; and it is hoped that informal as much as formal linkages and opportunities would be realised with farmers and farmer groups during the village level work.

3. Enhanced formal and informal research responsive to the agricultural needs of northern Ghana.

Again, the role of public sector research in the development of the training module, and to a lesser extent in its deployment, provides a direct opportunity for research responsiveness.

Clearly if the sub-project contributes to the realisation of the FARMER project outputs, then it too will be making some contribution to the realisation of the FARMER project outcomes, but particularly to:

1. The development of models of collaboration and partnership for relevant technology generation, transfer and utilisation.

The diversity response approach (DRA) equates to a 'model' of collaboration with farmers, and the responsiveness tool box (RTB) specifically provides a means for technology transference and utilisation. Complementary work being undertaken by the MoFA/NGOs/NRI post-harvest coalition has focused on technology generation, and anticipated work will focus on participatory technology development

In addition the sub-project may be considered to fit within the eligible activities referred to under 'operational support of programs in the short term' and/or 'funding for discrete, one-time initiatives'; specifically:

2. Distinct initiatives and projects that are short-term, which address weaknesses or constraints in research and extension, and which require specific resources to overcome these constraints and to encourage or demonstrate success of improved strategies and methods.
3. Capacity development activities including external technical assistance for needs assessment and training, equipment for offices and fieldwork and other operational support.

4. Sub-Project Activities and Management Responsibilities

Management responsibilities for the sub-project will be undertaken by MoFA. Leadership and oversight responsibilities will be vested in Mr Sylvester Adongo, the Regional Director of Agriculture, MoFA, Tamale, with general management responsibilities being delegated to Mr Fuseini, the Post-Harvest Unit Officer, Tamale.

The activities proposed for the realisation of the sub-project's outputs are a series of six training workshops, to be held at different locations within the three northern Regions. The participants will be key district-level players in the provision of post harvest extension services, both state and voluntary or private sector. The workshops will be based on work and a training module already developed during the *farm storage project*; but opportunities to add value to the approach and module will also be sought.

Each training, which will take place over a week, will have both a 'classroom' and village-based component. Approximately 12 participants (key DADU and NGO staff) from 3-5 districts will attend each training exercise. Professional facilitation will be provided by GDCA, together with inputs from the *farm storage project* team (2 local staff and 2 international advisors).

The development of tools and indicators to monitor progress against workshop purpose and the sub-project's outputs, will be participatory and developed and elaborated at each workshop, building on lessons learnt.

Terms of reference (TOR) for the facilitators will be based on those already drawn up for the earlier work, but together with the training module, will be further honed in the coming quarter. It is anticipated that the services of Mr Osman Abdel-Rahman of the Ghana Development Community Association, and of Mr Zakaria Abdul-Rashid of NGND, will be made use of; but additional private sector trainers will be sought to broaden the base of understanding of the diversity response approach.

Revision and development of the training module and process generally will be overseen by Mr Mike Morris of the Natural Resources Institute (NRI), with additional technical advise being supplied by Dr Rick Hodges of NRI. Only a day each per workshop of their time is included in the proposal, and no international travel, as it is hoped that this will be covered by the parallel CPHP research study.

Sub-Project Schedule

1st Quarter (Jan – Mar) 2005: Refinements to the existing training module (DRA and RTB), undertaken (and funded) by the existing CPHP coalition partners and advisors.

Milestones: Fully developed DRA/RTB training guidelines and TOR for facilitators.

2nd Quarter (Apr – Jun) 2005: 3 week-long training workshops held at different locations in 2 or 3 of the northern regions.

Milestones: 3 training workshops held; 3 workshop reports produced; 3 sets of participatory indicators developed; first set of proposed modifications to the training guidelines developed.

3rd Quarter (Jul – Sep) 2005: 3 week-long training workshops held at different locations in 2 or 3 of the northern regions.

Milestones: 3 training workshops held; 3 workshop reports produced; 3 sets of participatory indicators developed; first set of proposed modifications to the training guidelines developed.

4th Quarter (Oct – Dec) 2005: Follow-up interviews with selection of participants, and production of synthesis report on the '*Training for transformation: the diversity response approach*' sub-project.

Milestone: Participants' verification records (MOVs) of progress against workshop purpose; sub-project synthesis report.

5. Targeted Beneficiaries

The primary 'beneficiaries' will be key district level extension staff. The proposed training however is more akin to a 'training of trainers' course, and whereas it is not anticipated that the participants would replicate the training with those under their charge, it is anticipate that the training exercises will develop specific and transferable lessons for other field staff.

Ultimately the diversity response approach is aimed at ensuring that service providers respond to the views, needs and priorities of all resource-poor farmers and farmer groups in northern Ghana, and it is anticipated that the sub-project output indicators will reflect an improved situation for more diverse farmers in the respective districts, specifically in terms of availability and timely access to appropriate post-harvest information but also in its up-take and effectiveness in improving household food security.

During the same period (2005), the *farm storage project* team expect to be undertaking a study of 'farmer empowerment' approaches in Ghana (funded again by the CPHP), with a view to developing further insights as to how best demand-driven extension services may be promoted in northern Ghana. It is anticipated that this study will 'cross-pollinate' with the DRA work, ensuring and/or hastening emphasis on farmers and rural households.

6. Implementation of FARMER Cross-cutting Themes

Changes in farmers' behaviour

FARMER PROJECT CONTRIBUTION AGREEMENT

APPENDIX C – ESTIMATED BUDGET

Budget Items	Total Budget	Q1	Q2	Q3	Q4
1. **Consultant Fees**					
Trainers (x2) 10 days/course for 6 course	43,200,000		21,600,000	21,600,000	
NRI staff (x2) 2 day/course for 6 courses	52,848,000		26,424,000	26,424,000	
Documention staff (x2) 10 days/course for 6 courses	4,800,000		2,400,000	2,400,000	
Monitoring and evaluation staff visit 2 days/course	8,640,000				8,640,000
Preparation of M&E report 3 days	2,160,000				2,160,000
2. **Travel**					
2.1 International transportation					
2.2 International travel allowance					
2.3 Internal transportation (50,000/participant)	2,100,000		1,050,000	1,050,000	
2.4 Internal travel allowances and expenses					
Expenses for M&E visits to six districts	1,050,000				1,050,000
Fuel costs	3,240,000				3,240,000
Overnight expenses					
3. **Operational Costs**					
3.1 Office expenses including communications, office supplies, and report reproduction	1,575,000		787,500	787,500	
3.2 Vehicle Operating Costs (fuel @ 15 gal/course					
3.3 Equipment & Materials					
3.4 Training Costs and Materials					
3.5 Other operational costs (course)					
Each course with 14 participants + 2 trainers	43,200,000		21,600,000	21,600,000	
Meal costs/5 day course @7,200,000/course	32,400,000		16,200,000	16,200,000	
Accommodation costs @ 5,400,000/course	9,000,000		4,500,000	4,500,000	
Stationery costs/course @ 1,500,000					
4 **Other Costs (specify)**					

Totals	204,213,000		94,561,500	94,561,500	15,090,000