

## Chapter 4 The Crop Post Harvest Programme (CPHP)

Nick Price

### 4.1 SUMMARY

Key Issue	Key Findings
<p><b>Science Quality</b></p> <p>(a) Quality of experimental design and analysis</p>	<p>Most studies are well designed and analysed with appropriate techniques. The science fully meets the quality requirements and is fit for purpose.</p>
<p>(b) Contribution of projects sampled to new knowledge;</p>	<p>The projects reviewed varied greatly in their styles, concepts and aims. As a consequence the scores ranged from zero to maximum. New knowledge was greatest in classic bioscience projects and lowest in highly applied extension-type projects.</p>
<p>(c) Extent the projects use existing knowledge creatively in new contexts;</p>	<p>On the whole projects score highly, indicative of good, applied science.</p>
<p>(d) Awareness of all current knowledge</p>	<p>All projects were conducted against an excellent background knowledge base; clearly contractors have pride in their intellectual capital.</p>
<p>(e) Innovativeness and scientific risk-taking with comment on projects that are innovative and projects that are not;</p> <p>(f) How risk was <b>managed</b> by programmes and project managers and the lessons from this should be included.</p> <p>Address the issue of measuring science quality for applied projects with non-peer reviewed reports.</p>	<p>e) and f) As a highly applied programme, (more so as time went on), it is unreasonable to expect high levels of risk taking or innovation; indeed the tight management systems imposed by the logframe almost mitigate against creative research. However the programme manager and his team were highly effective in steering and guiding the projects in providing the kind of science outputs that would be favoured by the sponsor, even under changing rationales and policies.</p>
<p><b>Science Capacity Building</b></p> <p>Science capacity building in the south for both individuals and institutions.</p> <p>Include development of long-term institutional relationships between UK institutions and Southern institutions;</p>	<p>On the whole the programme built good links and long term partnerships. The adoption of the Innovation systems approach late on in the programme was a major feature in boosting the linkages and capacity building aspects of the CPHP. I still have doubts as to the scientific value of such an all out systems approach because, I believe in turning away from traditional suppliers of R&amp;D, (and hence knowledge, experience etc) "the baby may be thrown out with the bathwater".</p>
<p><b>Knowledge Dissemination</b></p> <p>Adoption, lessons etc. from different approaches to dissemination and uptake promotion.</p>	<p>I believe that the programme manager and his team largely shaped the dissemination policy of the CPHP, and as such there was an excellent balance of dissemination media in just the right proportions for the nature of the science conducted.</p>

Key Issue	Key Findings
<p><b>Management Approach</b></p> <p>Identify the lesson learning on identification of demand, relevant project design, appropriate dissemination and uptake pathways etc.</p> <p>Identify the lesson learning from different approaches in selecting and designing projects to achieve the purpose.</p> <p>Identify how the programme has evolved and become more demand driven.</p>	<p>The major advance in identification of demand came from the Innovation Systems approach adopted towards the end of CPHP. This has undoubtedly empowered local representatives, and has given a good overall feeling of “inclusiveness”. Whilst there is little doubt as to the advantage of this approach in these terms, I still remain in doubt as to its ability to produce better science. Also it does not always follow that demand priorities will be the best for long term good. The programme has very adroitly become demand led due to the efforts of the programme manager and his team. This has however been done because it was politically expedient rather than through any empirical reasoning. Both demand-led and science led approaches need to be considered for the optimum long term benefit in project selection, design dissemination and uptake. As an example; a major advance in (say) crop molecular science, requiring considerable strategic research to achieve practical benefits may not be adopted under purely demand-led approaches because of the imperative to develop “now” solutions.</p>
<p><b>Conclusions and Lessons for the Future</b></p> <ul style="list-style-type: none"> <li>• Knowledge dissemination</li> <li>• Capacity building</li> <li>• Maintaining high science quality</li> <li>• Management</li> <li>• Research themes for the future</li> </ul> <p>Recommendations on the future research themes should refer to DFID’s comparative advantage (or otherwise) in the context of international support to natural resources research.</p>	<p>Within the CPHP both knowledge dissemination and capacity building have been expertly guided and managed by the highly competent and professional programme management team and I see no reason to change this winning formula.</p> <p>In order to maintain high quality of science, both a technology-led and a demand led element should be present. This in turn will lead to a mix of strategic research and applied research. A logical if somewhat radical extension of this would be to have different management procedures for the different types of research, concentrating on milestones and progress pathways for the applied work, whilst allowing more creative freedom for the strategic work. This would enable research funds to be spent directly on research rather than excessive monitoring of questionable value. “One day spent responding to demands of project management is one day less research done”</p> <p>In a follow on programme the sponsor should have a clear view of their strategies and, as much as possible, try to retain them over time, (ie no paradigm shifts!). Issues such as: bioscience/social science balance, strategic/applied balance, demand-led/science-led balance, choosing the best contractor regardless of location, being confident of the above choices rather than relying on overburdening management tools; are all factors for which policies should be in place in advance. An increase in the number and/or involvement of trained scientists within the sponsor department would go a long way to achieving these ends.</p>

Key Issue	Key Findings
	The practical elements of a follow on CPHP should continue to address regional demand-led issues using the Innovation Systems approach but, critically, should develop some bold creative, innovative, strategic thinking in such areas as; climate change, pollution, crop quality, and non food crops.

## 4.2 ACHIEVEMENT OF PROGRAMME OUTPUTS (logframe in Annex 5)

### Outputs

The outputs from the Crop Post Harvest Programme (CPHP) are overall impressive and demonstrate well-planned and conducted studies. I believe that part way through the programme, the Programme Manager placed greater emphasis on outputs, and Project Leaders were given encouragement and assistance to maximise outputs and disseminations. Outputs from basic and strategic projects tend to take longer to achieve than from development or demonstration projects and this is reflected in the programme. In addition such outputs, (from basic studies), tend to be more formalised as scientific papers which, although they may not be so high profile for the funder, can be of high value in the scientific community.

The CPHP is very largely an applied research or development programme, and the outputs tend to reflect this, with significant numbers of end user reports, workshops, seminars and media coverage. A number of the projects have resulted in improved processes or systems in region, whilst at least one cluster (on diatomaceous earths) has led to the development of novel technology with excellent social, scientific, economic and environmental credentials.

There remains the question of whether the Innovation Systems approach will result in more outputs or better quality outputs, and I suspect that it may be more appropriate to the applied development studies than to basic or strategic science.

### The logframe

My own personal view of research by objectives, and the use of documents such as the log frame, much beloved of government departments, is that they can be counter productive. Science rarely works in straight lines and to manage a research programme against outputs and indicators laid down at the start of projects will result at best in self-fulfilling prophecies. That such documents are required by (principally) government departments demonstrates a lack of confidence in their own abilities to host good quality programmes and in their contractors to deliver them. Systems such as the logframe and the ROAME system used by some departments are most useful when dealing with highly applied research or experimental development and least useful for basic or strategic research in which the progress is never in the straight lines demanded by such a system. This results in wasteful revisions of objectives and may actually hinder the progress of a long-term study. I have heard the view that terms such as “objectives” and “milestones” are the biggest hindrance to research progress in the developed world, and whilst this may be an overstatement, it is true that some large corporations are now reverting to “inspirational” research rather than object-oriented research. The need to justify the expenditure of public money may be the most pressing reason why government research is over managed in this way. The major French public funded research establishment, the Centre National de la Recherche Scientifique, utilises different management systems depending on the degree to which research is basic or applied.

Within the confines of this personal reservation, I believe that the construction of the CPHP logframe is adequate in describing and shaping the programme as conducted, though I would urge more confidence and trust be placed in those chosen to carry out the programme which would result in greater freedom to try new things.

## 4.3 BACKGROUND

### Introduction

#### Preamble

The CPHP is part of the DFID Renewable Natural Resources Research Strategy, (RNRRS). The strategy was planned to operate over a ten year period and commenced in 1995. The CPHP was charged with carrying out research in the natural and social sciences aimed at improving the storage, processing and marketing of crop products in target countries.

Over the 9 years of the programme from 1995 to 2004 crops featured in the CPHP have been; cereals, roots and tubers, legumes, oilseeds, horticultural crops and plantain/banana. The investment in CPHP amounts to £24M across five livelihood themes; market access, processing, storage, food safety and institutional arrangements for technical innovation.

The overall goal of the CPHP was the improvement of productivity and productive potential in the key areas and systems through reduction in post harvest losses, and development of processing and marketing innovations. The research themes are focused on this goal by attempting to:

- Reduce post-harvest losses through reduced perishability, more effective storage and handling and improved access to transport
- Identify and exploit market opportunities and remove constraints to market access
- Reduce drudgery and release labour for on- or off-farm activities through more efficient processing
- Improve the quality and add value to primary crops through processing technologies and improvements in storage and handling,
- Improve flows of technical information to actors in the chain from production to consumption through institutional development
- Improve opportunities for on- and off-farm employment through backward and forward linkages in the agricultural sector and the development and management of small enterprises.

Several interim reappraisals of the entire RNRRS have been conducted coinciding with changes of government and more recently refocusing of DFID policies. The impact of these realignments on the CPHP have been:

- A shift from technically-led to demand led projects
- A shift from UK-led to stakeholder-led projects
- A strong emphasis on poverty alleviation benefits arising from research

The CPHP is designed to benefit people involved in post-harvest commodity systems by providing them with opportunities for enhanced income, employment and food supply. A common objective in all work is to improve food security of poor households. Outputs specific to each production system are targeted as follows:

- Peri-urban interface: Strategies which increase availability and improve quality of horticultural foods and provide better access to markets.
- High potential system: Strategies which increase availability and improve quality of cereal and horticultural foods and provide better access to markets.
- Forest-agriculture interface: Strategies which increase availability and improve quality of root crop and horticultural foods and provide better access to markets.
- Semi-arid system: Strategies which improve food security of poor households through increased availability and improved quality of cereal and pulse foods and better access to markets.

From its inception to date 154 projects have been commissioned under the CPHP. As a broad generalisation projects in the early part of their life tended to be technically-oriented and as they, and the programme became mature, implementation and dissemination became larger components of the projects. Similarly, as the programme matured, the focus shifted from being life-sciences dominated to having larger elements of socio-economic material.

The projects have developed and disseminated a wide range of technologies, protocols, strategies and policy recommendations in Zimbabwe, South Africa, Mozambique, Malawi, Zambia, Namibia, Uganda, Tanzania, Kenya, Ghana, Nigeria, Benin, India and Bangladesh.

## 4.4 SAMPLING AND METHODOLOGY

### Sampling of Projects for Evaluation

As described above, the CPHP comprises 154 projects across five livelihood themes; market access, processing, storage, food safety and institutional arrangements for technical innovation. A selection of projects which represent all these themes were selected.

Very short projects may not be indicative of the overall qualities of the programme so projects with a duration of 2 years or more were selected. These projects are sufficiently long lived to exhibit a natural evolution which include the more technical features in the early phases followed by development, implementation, dissemination and impact in later phases. As such, projects which were commenced before the start of this evaluation period (1995) were not selected. Within the remaining projects, a number of closely related projects forming clusters were selected for evaluation to increase the breadth of those projects evaluated. (see Annex 1 for a list of the projects reviewed)

This approach together with discussions with the programme manager have led to the selection of the projects shown in below for detailed evaluation. (see Annex 1 for detail of the projects evaluated)

The selected projects fall into 4 clusters of projects which represent a natural progression from strategic research to technology application the clusters are: Opportunities for Cassava, Diatomaceous Earths, Local Rice Production & Marketing and Innovation Systems.

### Evaluation Criteria

The programme has been evaluated on the basis of 8 Criteria:

- Generation of new science
- Use of existing science in new contexts
- Innovation and risk taking
- Awareness of current knowledge
- Achievement against the logical framework
- Science capacity building
- Links formed
- Dissemination

**Projects Selected for Review** (See Annex 1 for a list of the projects reviewed)

### Cluster 1: Cassava cluster

#### Project a) R6504. Expanded markets for locally produced cassava flours and starches in Ghana

The project was developed with the purpose of addressing the need for improved levels of income generation and expanded market opportunities for cassava that had been highlighted by farmers in Ghana. R6504 comprised 4 activities: An assessment of the market for flour and starch in Ghana; an assessment of the potential of cassava starch and flour as substitutes for currently used materials; development of cassava flours and starches to meet market demands; dissemination of key findings to target organisations. The project is a good example of a well balanced mix of information gathering, applied research and dissemination/implementation.

### **Project b) R7418 Development of new market opportunities, to increase the contribution that cassava makes to sustainable rural livelihoods**

The purpose of this project was to contribute towards improved sustainable livelihoods, and better levels of income for cassava farmers and processors in rural areas by expanding the range of market opportunities available for cassava-based products, and promoting use of cassava by industry. The outcomes of project R7418, include delivery of validated cost effective technologies for production of high quality cassava flour for use in selected bakery products and plywood glue, sugar syrups for food use, industrial alcohol for the chemical industry and a complete paperboard adhesive for the cardboard packaging industry. Projects R7418 and the previously evaluated project, R6504, dealt with strategic and adaptive issues to prepare the way for uptake of cassava as an industrial commodity. For this reason impact on rural livelihoods was comparatively limited, but the projects paved the way for the final project in the cluster, to complete the process. The project had 3 main areas of output: Assessment of the potential for cassava-based syrups and developing procedures for conversion of cassava to sugars and industrial alcohol; development of cassava flour-based waterproof adhesives for plywood and paperboard manufacture; promotion of the potential for cassava as an industrial commodity for use in production of sugar syrups, industrial alcohol, plywood and paperboard adhesives to producers, processors and potential users of cassava-based products.

### **Project c) R8268 Sustainable uptake of cassava as an industrial commodity**

This project represents the final implementation phase of the cluster of projects designed to research, develop and implement alternative uses of cassava as a means of generating wealth and thus reducing poverty. This project seeks to improve rural livelihoods, through industrialisation of cassava, via the establishment of an integrated supply chain to provide manufacturers with an assured supply of consistent quality cassava products at a competitive price.

There are 8 main activities in the project including: provision of micro-finance for stakeholders, training, (business and technical), fabrication, installation and testing of equipment, troubleshooting, and monitoring.

The project does not fall into the Frascati definition of research, but rather is Experimental Development, based on earlier research. However since the RNRRS calls for implementation of its research programmes, this project represents an ideal conclusion to the foregoing work

## **Cluster 2: Diatomaceous Earths**

### **Project a) R6312 the use of non-conventional methods for protecting cereals and pulses during storage against insect pests**

Alternatives to conventional neurotoxic insecticides are being sought worldwide. Although insecticides are developed commercially only for major mass markets it has become clear that some alternatives will work much better in certain circumstances than others. Thus it is important to “tailor” choice of insecticide to the pertaining situation regarding; pest, climate, economy, available technology and storage conditions. This project aimed to carry out strategic to applied research to indicate potential novel technologies for protection of stored cereals and pulses. At the time this project was begun, developed countries were beginning to assess the prospects of insect juvenile hormone analogues and chitin synthesis inhibitors, for insect control in a variety of situations. This project quickly demonstrated that, although effective against maize pests, these so called insect growth regulators would not work well against beetle pests of pulses, (e.g. bruchids). The use of inert dusts, especially diatomaceous earths, (DEs) became the focus of the remainder of this cluster of projects.

### **Project b) R7034 Grain storage pest management using inert dusts**

Following on from the strategic information gained in R6312, this project aimed to develop environmentally sustainable and safe post-harvest pest control methods, by working towards the replacement of conventional synthetic organophosphate insecticides with inert dusts for use in small and medium scale storage. The project addressed the identified constraint through a series of trials using the diatomaceous earths “Protect-it” and “Dryacide”.

The project consisted of 7 activities: Laboratory assessment on the persistence of Dryacide and Protect-it; assessment of the resistance potential of insects to inert dusts; field trials to assess the efficacy and persistence of inert dust admixture; on-farm participatory trials; extension messages and literature; laboratory based assessment on the efficacy of the dusts applied as aqueous slurries to structural surfaces; small-scale application of slurries

**Project c) R8179 Small-scale farmer utilisation of diatomaceous earths during storage**

Project R7034 found that DEs offered an alternative to organophosphate insecticides and are effective in controlling post-harvest insect pests in maize, sorghum and cowpeas stored for >8 months, enabling households to increase their food security and control over grain sales. This project which is incomplete at time of review is aimed at verifying these findings under semi-arid conditions in Tanzania where producers have constantly prioritised storage losses, and where the devastating larger grain borer is endemic. Local sources of DEs are being evaluated for their potential as sustainable low cost sources of DE. The project has an impressive list of closely involved stakeholders including: the Tanzanian Ministry of Agriculture and Food Security; Department of Soil Science and Agricultural Engineering of the University of Zimbabwe; Diatom Research and Consulting; Post Harvest Technology, Institute of Agricultural Engineering, Zimbabwe; Department of Agritex, Zimbabwe; EcoMark Limited, Zimbabwe. The considerable interest in this technology is shown by the range of co-funders, (The Tanzanian Ministry of Agriculture and Food Security, the University of Zimbabwe, the Institute of Agricultural Engineering, AGRITEX, and EcoMark Ltd). The project activities are: on-farm trials of commercially available DEs; farmer evaluation of trials, samples of Tanzanian and Zimbabwean DE collected and evaluated in laboratory trials; trials of local DEs; assessment of most effective local DEs; acceptability testing, registration on both countries, farmer-managed trials; preparation of extension materials; training and workshops, stakeholder evaluation; roll out.

This list is a highly ambitious list of activities for a project with only £300,000 of input over 3 years.

**Cluster 3: Local Rice Production & Marketing****Project a) R6688 Competitiveness and Marketability of Local Rice**

The objective of this project was to assist in the development of a post-harvest strategy for local rice production, based on validated research information, to help support sustainable small-scale processing of rice in Ghana. The activities were: appraisal of the rice marketing, pricing and distribution system; rice production system survey; assessment of comparative profitability of production systems; national survey on post harvest practices in the rice industry; national survey on consumer preferences and price/quality relationships; loss assessment survey; techno-economic evaluation of rice production enterprises; presentation of findings to focus group.

**Project b) R7531 Post-harvest practices affecting rice milling quality**

This project aimed to identify those post harvest practices in Tanzania that account for the production of good-quality rice using steel dehuller mills. Information obtained would be made available in other African rice processing regions, such as Ghana where rice quality problems are known to exist. Main activities were: visits made to Tanzania and Ghana to survey the paddy marketing and processing systems; experimental paddy processing trials carried out on three varieties of paddy originating from Tanzania and Ghana.

These research activities led to the following outputs:

- Improved knowledge of rice marketing, handling and small-scale milling in Tanzania
- Improved knowledge of paddy and rice post-harvest practices being used in Tanzania
- Factors affecting quality of Tanzanian rice defined
- Confirmation of paddy milling operating conditions which result in good quality rice

**Project c) R7543 Improving Rice Parboiling Efficiency**

R7543 attempted to identify and rectify the problems associated with the variable quality of locally produced and processed rice in Ghana touched on all aspects of production, processing and preparation. This project identified a critical quality issue in the parboiling process and set out to improve it. The project activities were: an evaluation of the socio-economic aspects of rice parboiling in Ghana; the design and in-field, end-user evaluation of the improved prototype parboiling vessel; consumer acceptance studies of parboiled rice produced by the improved parboiling vessel; a sensory evaluation of parboiled rice produced using the improved process; the evaluation of the quality of parboiled rice produced using the improved process, and of the quality of rice available in local markets. The project is very much at the practical end of the R&D spectrum, being firmly in the “Experimental Development” category.

### **Project d) R 8263 Enhancing rural livelihoods through a new coalition arrangement for the dissemination of improved rice post-production and marketing technologies in Northern Ghana**

R8263 is a coalition-based approach to validate, optimise and disseminate findings made and technologies developed in previous projects in this cluster. Promotional strategies to introduce suitable technologies and practical solutions for the improvement of locally parboiled rice are being refined and developed, with a view to increasing the income of all stakeholders in the production chain. Quality improvements are being introduced via locally active agencies using a variety of training materials and demonstrations of Best Practice. Consumer awareness of the improved product as an alternative to imported rice is being promoted, providing stakeholders with an opportunity to access more lucrative sectors of the local market. At the time of evaluation this project is ongoing.

### **Cluster 4 Innovation Systems**

#### **Project a) R7502 Optimising institutional arrangements for demand driven post-harvest research, delivery, uptake and impact on the livelihoods of the poor through public and private sector partnerships**

This research has developed and applied a new conceptual framework to the analysis of partners and innovation processes in the area of post-harvest. This is referred to as the innovation systems framework. Using this framework the research has examined on-going CPHP projects as well as other relevant instances of post-harvest research. Through this empirical work it has identified a series of features of partnership arrangements that promote innovation in ways relevant to the poor. It has also identified the central importance of institutional learning and change as a way of evolving more effective innovation processes and outcomes

Project b) R8310 Institutional learning and change: a capacity development approach to exploring and strengthening post-harvest innovation systems in South Asia

This project proposed a combined research, training and networking approach to capacity development in post-harvest innovation systems in South Asia. The development and emergence of more effective and socially inclusive innovation systems could become a key driver of poverty-relevant development. This project aimed to use an interactive policy research approach to strengthen institutional learning and change with a view enhancing the capacity of post-harvest innovation to respond effectively to the needs of the poor. Activities included: literature reviews; case studies; training workshops; interaction with other philosophical approaches; database of those involved; sharing experiences.

At the time of evaluation this short, (16 month) project is still in progress and no output documentation was available. Scoring is thus based on the Project Memorandum Form.

## **4.5 SCIENCE QUALITY**

### **Contribution of projects sampled to new knowledge**

The clusters chosen varied greatly in their styles, concepts and aims, ranging from classic bioscience research to highly applied extension work. As such the scores for contribution to new knowledge varied widely from zero to maximum.

Much of the Cassava cluster was not designed to generate new knowledge but was aimed at developing cassava flours and starches for industrial use. However associated postgraduate studies produced some good new science in the field of enzymic breakdown of cassava carbohydrates.

The cluster produced some very interesting new information in the areas of: optimal processing methods, shelf-life, optimum time after harvest for processing and optimal proportion of cassava flour that can be substituted for wheat in food products. As a result the cluster scored widely in this category ranging from 0/10 for the implementation phase to 8/10 for the associated laboratory postgraduate biochemistry.

Within the diatomaceous earths, (DE) cluster the initial laboratory project built on existing knowledge rather than generating new science and scored only 4/10 in this category. However subsequent work in this cluster has been world-leading and has generated much new and useful scientific knowledge, resulting in scores of 8/10 for both later projects.

Although R8179 represents the final phase in the development of this new technology in the context of poor African farmers, considerable new knowledge has also been obtained. The concept of using locally mined DEs is highly commendable and is likely to be a crucial factor in the success of the technology in region. The discovery that some local deposits do indeed have the potential to be used in stored product insect control is a major new finding. A spin off from the project was the finding that local supplies of Actellic, (pirimiphos methyl) were being adulterated resulting in beliefs that the OP was losing its effectiveness.

The DE work within the CPHP is a major success story. It has excellent applied research credentials, good publications, good profile, and is award-winning. It evolves into a highly successful implementation phase and has the environmental, economic and social benefits rarely seen in so short a time from a piece of modern science. All involved are to be congratulated.

The 4 projects in the rice cluster had 4 major activities; information gathering, problem identification, problem solving and dissemination. As such none of these activities were planned to generate new scientific data. The data collected was pre-existing and although perhaps never previously assembled, cannot justifiably be called “new science”. As far as one can tell no new methodologies for collecting the data were used. The later projects in the cluster were essentially extension rather than R&D and overall the cluster scored either 0/10 or 1/10 in this category.

In contrast the 2 project cluster on Innovation Systems scored a maximum 10/10 for generation of new science. The exploration of an entirely new paradigm for the conduct of “research for development,” was investigated in a field of study so far not considered, (agricultural sciences). The principles, terminology and practices of Innovation Systems were still evolving as this project commenced. All preconceptions of who should “do research”, why and how, as well as the accepted definitions of R&D activity were abandoned in favour of new roles and relationships in genuine partnerships as opposed to those often put together for expedience for example in EU funded R&D.

### **Extent the projects use existing knowledge creatively in new contexts**

Within the cassava cluster this was a high scoring category; ranging from 7/10 to 10/10.

The projects successfully utilised a range of techniques used in the production of starches, and the subsequent industrial processing in the manufacture of paperboard, plywood and baked food products. These techniques have been used to develop processing methods for cassava in place of traditional, starch sources.

Economic assessments, feasibility studies and “in-situ” experimental production of raw materials were carried out using the new science obtained, in order to apply the knowledge gained to scale up production and to carry out production of cassava-based products in the region and with the facilities available.

The DE cluster also scored highly in this category with scores of 6, 10, and 10 out of 10.

This is a particular strong point of R7034, which produced a prodigious amount of data evaluating the potential of two DEs. The investigations into factors affecting efficacy and the subsequent small scale trials are particularly commendable.

The large amount of field trialling utilised standard trial protocols but generated new data on DEs in new practical situations. This is proving to be a very useful addition to the global collection of data on the insecticidal qualities of DEs.

Scores for this category in the rice cluster ranged from 2 to 10 out of 10.

It is likely that data from R6688 has never before been gathered or used in this way, although the data can hardly be described as science. However the context is new and the data gathering essential to the purpose of the study.

Although factors which determine the quality of milled rice were established it was an unrelated observation (availability of rubber rollers) which were suggested as the major factor for poor quality milled rice in Ghana

A considerable amount of modern technology for assessing the quality of starch-based foodstuffs has been used to good effect on this very practical problem. Some very good science has been conducted in R7543 to correlate a range of physicochemical parameters with finished product quality and consumer preference.

The final project in the cluster had little R&D in it, but there was some technology input in terms of adaptation of the Engleberg dehuller to mill parboiled rice more effectively.

The Innovations Systems cluster scored maximally in this category, mainly because of the novel approach to the organisation and conduct of research.

### **Innovativeness and scientific risk-taking**

The cassava cluster scored highly as an innovative group of projects, in the concept of cultivation of crops for industrial rather than food use. In this context R6504 was ahead of its time and thus innovative. It was also considerably risky, in that use of a staple food crop to produce “value-added” rather than purely as a source of nutrition, as an alternative modus operandi to poverty alleviation in regions of low access to technology could easily fail.

Much of the innovation and risk taking in this project cluster occurred in the more strategic elements seen in R6504. However, the original studies conducted under R7418 for the Doctorate and Masters degrees showed considerable innovation. Risks still exist in the project in terms of the intended applications of cassava, but diligent economic assessments and feasibility studies eliminated many of these risks. The cluster scored between 7/10 and 10/10.

Likewise the Diatomaceous Earths (DE) cluster averaged over 9/10 for this criterion.

At the time these projects were conceived, moving away from the tried and tested insect control agents, especially in the developing world was a highly risky undertaking. In retrospect, most developed countries are now trying to ban neurotoxins such as organophosphates (the main storage insecticides) and to replace them with safe sustainable and preferably toxin-free alternatives, (such as DEs).

Although the earlier project shouldered most of the risk taking, the conduct of practically based studies aimed at replacing the panoply of neurotoxins with a non-chemical natural product remains challenging, speculative and innovative.

In contrast the rice cluster scored between 2 and 5 out of 10 for this criterion since the work was primarily information gathering and practical problem solving.

The study brought to light new information on rice production, processing and quality which in turn allowed the identification of constraints in terms of improved adoption of local rice processing. The work is relatively low risk since rice is increasingly grown and consumed in region and the aim of the work is to reduce reliance on imports by improving the local methods.

The Innovations Systems cluster scored maximally in this context. In deciding to completely abandon the philosophical approach to “research” for developing countries and to replace the concepts of the hierarchical, linear and somewhat patriarchal approach in favour of a completely new systems of equal and inclusive partnerships at all stages of the study is both highly innovative and extremely risky.

### **Awareness of all current knowledge**

All projects scored very highly in this category indicating that the contractors chosen were extremely competent and knowledgeable in their respective fields, and that comprehensive literature searching was a key element of all the projects.

In the cassava cluster the first two outputs of R6504 were clearly designed to provide the project with both a “state of the art” knowledge base and a very detailed market opportunities survey. The first activity produced detailed information “in region”, on starch markets, market sectors, tonnages, sources, cassava processing, consumption, sales, role in the economy, and (although not explicitly declared) a SWOT analysis. The second activity produced an excellent overview of the technical, social and economic issues influencing the potential success or failure of the project as a whole. Both these outputs are exemplary in their comprehensive cover, and demonstrate an encyclopaedic awareness of the current knowledge.

The background to these projects has been thoroughly prepared from all aspects; technical, social and economic. Market surveys and “on the ground” evaluations of likely project success have paved the way for implementation of this novel technology in Ghana. As a result all 3 projects score a maximum 10/10.

The work in the diatomaceous earths cluster has become at the forefront of its field and this in part is due to an in depth knowledge of the area by the project staff. The high status of the team in this scientific discipline has led to two of the projects being marked 10/10. The first project in the cluster received a creditable 8/10 when the staff were becoming familiarised with the field.

The rice cluster also showed a high level of background knowledge. It was clear from the detailed information available plus the considerable amount of supporting information collected as part of the project activities that a very sound background has been gained by the project team. Marks in excess of 8/10 were gained by all projects in the cluster.

The innovation systems cluster was only embarked upon following a period of intensive discussions, reviews, literature searches and training sessions aimed at ensuring a comprehensive knowledge of this new paradigm before embarking on it. The team became pioneers in the field, and the cluster scored a maximum 10/10.

### **Achievement of science outputs in logframes**

On the whole the clusters met their log frame commitments very well. In the case of notable failures, it was often unforeseen problems, (technical or political) which delayed rather than prevented achievement of goals.

In the cassava cluster, at the output level, the results directly contribute to “new market opportunities validated, capable of increasing value of commodities produced by the poor”, whilst Project R7418 fully met its output level targets as set in the project logframe. The final project was yet to be completed but appears on target to meet its logframe commitments. Four companies are utilising the cassava flour/syrup technology and an industrial scale trial of plywood manufacture using cassava flour as an extender in the adhesive mix has been successfully accomplished. Training has been successfully conducted.

All projects scored 9 or 10 out of 10.

After a shaky start in which delays caused only a 6/10 score for the first project in the diatomaceous earths cluster the, remaining projects more than made up for this, scoring 8 and 9 out of 10.

As a piece of strategic research R6312 contributed directly to the output “Environmentally sustainable and post-harvest pest and pathogen control methods and procedures developed and promoted”, which aimed at economically significant control of post-harvest pest of stored grains by the year 2000. Delays experienced were outwith the control of the project team or management.

R7034 is well aligned with the original logframe purpose of improving on-farm grain storage, with particular reference, at the output level, to “Environmentally sustainable and post-harvest pest and pathogen control methods and procedures developed and promoted”. Much was achieved in this project and much progress made towards the logframe goals. In addition R7034 significantly contributes to new logframe indicators brought in during the project; especially “By 2002, increased numbers of poor households, in two target countries, who use improved storage and agro-processing techniques in an environmentally sustainable manner”.

Although the project is still ongoing, all the year 1 outputs were achieved and an independent review concluded that the project was making exemplary progress. Political difficulties in one region and regulatory delays in the other have hindered some of the later outputs. The ambitious nature of this project makes some setbacks inevitable but overall progress is impressive.

The rice cluster delivered at a very practical level and both in these terms, and in the permanence of the training manuals produced. All projects were closely aligned with the logframes and scored in excess of 8/10 for this criterion.

Although some deliverables in the Innovations Systems cluster were not forthcoming; e.g. decision tools, it was (in my view correctly) felt that one emerging result of the project was that decision tools were not going to be important. Aside from this the one completed project has comprehensively met its logframe commitments, scoring 9/10.

## **4.6 SCIENCE CAPACITY BUILDING**

### **Science capacity building in the south**

The cassava cluster scored between 5/10 and 10/10 for capacity building although R6504 was an enabling project, designed to lead to further practical exploitation projects.

In addition to the training of postgraduates in Ghana, R7418 included a programme of training and awareness seminars organised and run by the National Board for Small Scale Industries in Ghana. A number of local trades people and small industrial concerns were brought within the project “family” to ensure that interest and involvement, as well as expertise in the various processing techniques was available in region.

The long term relationships built up with industries concerned with baking and with plywood manufacture have been sustained by troubleshooting support. Now that industrial take up of this technology is in full swing, capacity building must be seen as one of the major achievements of the cassava research cluster, the final project scoring 10/10.

The diatomaceous earths cluster scored right across the range from 0/10 to 10/10 for this criterion. However, the first project in the cluster was a strategic laboratory-based project which was concerned with concept proving and as such did not have capacity building as one of its aims. This should in no way be seen as a criticism of this project which paved the way for its successors which scored 8/10 and 10/10 for capacity building.

Both the second and third projects in the cluster entailed considerable amounts of fieldwork in Zimbabwe in collaboration with the Department of Agricultural Technical and Extension Services, (AGRITEX) and with the help and cooperation of the farmers from the Binga and Buhera districts. Farmers and extension staff learnt about the use of DEs as grain protectants in Zimbabwe, through a number of pathways including: direct involvement in the trials (~50 farmers & 10 extension staff); informal neighbourhood and community information networks; active participation at field days (both in the communities involved in the trials (~400 farmers) and at the IAE research station (~100 farmers) and agricultural shows (>300 farmers); field extension staff involved with the project; local newsletter articles and radio programmes.

Farmer-led trials, farmer evaluation, student training, extension materials, newsletter articles have ensured that this technology has comprehensively integrated itself into local organisations, official bodies and communities with great effect.

Similarly with the rice cluster, the first project was an information gathering exercise and scored poorly on capacity building, though once again this is to be expected with a project of this nature.

The remaining three projects in the cluster scored well for capacity building (7, 8, and 9 out of 10). By defining the paddy post harvest and processing procedures the study was able to make available information to the Ministry of Agriculture, Technoserve and the Food Research Institute in Ghana. This information assisted stakeholders by providing support to the rice sector in both countries. Considerable “hands on” technology transfer occurred in region and this has led to a structured training programme. The involvement of local parboilers in the installation and operation of the prototype systems was a major positive aspect. An end-user of the prototype parboiler in Zebilla village received an award for the quality of her improved parboiled rice during National Farmers Day on 6 December 2002

The concept of full inclusivity embodied in the Innovation System philosophy is interlinked with that of capacity building and project R7502 set out to forge strong and lasting links and to incorporate capacity building as an integral part of CPHP work. R7502 has taken the first steps into a new set of relationships of which some partners may be wary. Project R8310 was incomplete at the time of review but would be expected to improve on the 6/10 score for capacity building awarded to project R7502.

### **Development of long-term institutional relationships between UK institutions and Southern institutions**

The cassava cluster scored between 5/10 and 10/10 for linkages.

R6504 was managed jointly by the Natural Resources Institute (NRI) of the United Kingdom, the Food Research Institute (FRI) of the Government of Ghana, and the Department of Nutrition and Food Science of the University of Ghana. The Food Research Institute, University of Ghana, and the Department of Nutrition and Food Science and the Forestry Research Institute of Ghana were major players in conducting the research and these organisations remain actively linked to the CPHP.

The final activity in R7418 was specifically concerned with forging strong and lasting links with the aim of making the new uses of cassava a reality rather than just a research output. Whilst this output; “Potential for cassava as an industrial commodity for use in production of sugar syrups, industrial alcohol, plywood and paperboard adhesives promoted to producers, processors and potential users of cassava-based products” was essentially a dissemination output, it also laid the foundation for long lasting links to a sustainable set of new technologies to follow on in the final project of the cluster, which scored maximally for this criterion

The diatomaceous earths cluster followed similar patterns for this criterion as for capacity building, and for the same reasons. The first project was very much “feeling the way” and although the field trials utilised links with Chitedze Research Station, Lilongwe, Malawi, otherwise no links were forged in region. The second and third projects in the cluster were very much concerned with building links in region.

These projects have an impressive list of closely involved stakeholders including: the Tanzanian Ministry of Agriculture and Food Security; Department of Soil Science and Agricultural Engineering of the University of Zimbabwe; Diatom Research and Consulting; Post Harvest Technology, Institute of Agricultural Engineering, Zimbabwe; Department of Agritex, Zimbabwe EcoMark Limited, Zimbabwe. The considerable interest in this technology is shown by the range of co-funders, (The Tanzanian Ministry of Agriculture and Food Security, the University of Zimbabwe, the Institute of Agricultural Engineering, AGRITEX, and EcoMark. The links formed the basis of what was to become a very active network.

The final project, R8179 has paid specific attention to assembling links that will enable the DE technology to become firmly established in region. The links encompass all stakeholders necessary for the uptake to be robust including researchers, farmers, local politicians, regulatory agencies and agrochemical companies. The projects scored 2, 8, and 10 out of 10 for this criterion.

On linkages the rice cluster scored between 5 and 10 out of 10. Project R6688 began the process and formed useful links with the Food Research Institute, Ghana; Crops Research Institute, Ghana; Savannah Agricultural Research Institute; Ghana Irrigation Development Authority and the Institute of Statistical, Social and Economic Research. In the following project, R7531 this was augmented by good co-operation with farmers, local millers, Min. of Ag. and Sokoine University.

Subsequent projects developed links with key players in the Ghanaian rice sector including: NGOs (Gratis Foundation; Lowland Rice Development Project; Amasachina); MOFA – Agricultural Engineering Services Department; University of Ghana (Department of Agricultural Economics); Technology Consultancy Centre (TCC-University of Science and Technology, Kumasi); and, Food and Drugs Board, Accra. The final project was conducted as an Innovations Systems project. The dissemination outputs and the design of the innovation system at the outset demand strong links. These have been successfully put in place and include: Department of Agricultural Economics (DAE), University of Ghana; Adventist Development and Relief Agency; Technoserve, Accra; Ministry of Food and Agriculture, Bolgatanga (MOFA), Ghana as well as local farmers, processors and parboilers. This final project scored a maximum 10/10 for links formed.

The Innovation Systems approach has been controversial and not all parties agree on its merits. The recipients of the programme in region, however, seem happiest with its outcomes; particularly in the strong local involvement in all aspects and at all stages.

The projects have been designed to maximize strong links and appear to have been very successful in this, though at the time of review the second on the two selected projects remained to be completed. A maximum 10/10 was awarded for the cluster.

There is some concern that the strong motivation to include parties in region in all aspects of the process, has marginalized some of the top quality expertise in UK in favour of “re-inventing the wheel” in region. This is potentially wasteful of resources in pursuit of political correctness. It is important that the existing, (but rapidly disappearing) expertise in the RNRRS’s traditional contractors be harnessed where it is unique and high class, and, in the process of research, the spin off will be the training the next generation of post harvest technologists in region.

## **4.7 KNOWLEDGE AND DISSEMINATION**

### **Rating of the overall result knowledge dissemination from programme**

Dissemination has been a particularly strong point of the programme as a whole. This is facilitated by the strong emphasis placed on dissemination by the programme manager team. The full details of the scoring of individual projects against 5 sub criteria for dissemination is contained in the full specialist report submitted to the core team and for purposes of clarity will not be repeated here. The overall mark for dissemination for the entire programme is 8.5 out of 10 and represents a huge effort by the project leaders and the programme management team to ensure that the CPHP is well published, publicised, documented and otherwise disseminated.

## 4.8 MANAGEMENT APPROACH

### Organisation & Management

The CPHP is run and managed by NR International. The CPHP commissions research on processing, marketing and storage of cereals, root crops, legumes and oilseeds, and horticulture. NR International employs the programme manager, to manage delivery of the programme. The programme manager is supported by a full time assistant manager and by 3 part time posts; personal assistant, website and database administrator, and assistant programme co-coordinator. In addition two consultants act as partnership advisor and monitoring & evaluation, (M&E) advisor. The CPHP is unique amongst RNRRS programmes in having four regional offices located in the regions at the receiving end of the science. The offices are based in Kampala, Harare, Hyderabad and Accra. From 2001 the regional offices helped shape the CPHP strategy and from 2002 they have acquired increasing responsibilities for management functions of the programme. This was part of the paradigm shift which took place in 2002 in which much activity both managerial and scientific was devolved to the target regions rather than UK. At the same time the emphasis of the programme shifted from a knowledge acquisition base to one of alleviating poverty. All projects have to demonstrate that their outputs could or would have a direct effect on poverty in the target region.

### Processes & Procedures

At first sight the operation of the CPHP seems rather overbearing and excessive. On closer inspection the management systems have arisen through genuine need and it is clear that the programme benefits from a thoroughly professional management, which is divorced from, but has a deep commitment to, the conduct of the programme itself.

In the early years of the programme the emphasis was on technical advance and scientific “push”. Due to a number of policy, (and government) changes, the emphasis shifted towards end user “pull”, poverty reduction and capacity building in region. The CPHP responded positively to these changes with a number of initiatives, foremost of which is “Partnership for Innovation”. Partnership for Innovation aimed to improve the quality and sustainability of the research partnerships among collaborating institutions initiated by projects; and improve the relevance and ownership of CPHP outputs among target institutions. The National Innovations Systems model for conceptualising and operating R&D systems was chosen as the vehicle for changing the way that CPHP canvassed, commissioned, conducted, managed and monitored its research. The approach was continuously monitored and progress independently reviewed in 2004, (From ‘Research’ to Poverty Reducing ‘Innovation’, A Policy Brief from SRA Ltd, by Andrew Barnett, January 2004). The results highlighted include an increased impact of projects and a shift from “research” to “development” (in terms of the OECD “Frascati” definitions); factors which have featured large in the discussions of the current Evaluation Team. It may be argued that it doesn’t matter if the programme is life sciences-based research or socio-economic development, if the latter is more appropriate in meeting the sponsor’s policy goals. However neglect of the more fundamental science may lead to the end users missing out on new technologies or more “high science-based” long term solutions. A “seedcorn” or “horizon-scanning” fund could be one solution to this vacuum.

### Reporting and Monitoring

The CPHP Management Team are constantly seeking to make sure that their systems and their commissioned science meets the ever changing needs symptomatic of research funded by government Departments, (ministries). In order to stay “on message” the team have commissioned many reviews and position papers, and all have been made available for this evaluation. They include:

- Thematic reviews: 2 complete, 1 in progress and 2 awaited
- PAC review: a self assessment
- M&E Advisor: CPHP uses a part time advisor
- Reviews of FTRs: Final Technical reports are independently reviewed
- Geographical focus: internal report
- Livelihoods and poverty: internal report
- Reporting Monitoring and Review of Research Projects ( See Annex 2)

There may still be some scope for rationalising the multiple reporting formats and frequency of reporting required of project leaders and perhaps combining some reporting methodologies with dissemination tasks, but the Programme Management team are continually reviewing their reporting procedures.

## Promotion & Dissemination

The management team is also proactive in terms of exploitation of its science, and although much in this regard is expected at project leader level, the CPHP team are proud of their work in promoting and disseminating their science. To ensure that the most effective methods are used the team are constantly reviewing their mix, and in 2004 conducted a review of “Good Practice in Communication”. The team has a clear view on the most effective use of all dissemination media, and uses them to good effect. Worthy of particular mention are Harvest and the CPHP websites. In 2000 the Programme produced Harvest, a high quality glossy publication that presented its achievements in an easy to read, journalistic format. Copies were sent to science editors of national newspapers and magazines in the UK as well as existing and potential partners, donors and policy makers.

The CPHP website is a first class example of an easily navigable, eye-catching, entertaining, and very useful resource. Not only that but it is also a very significant repository for much of the documentation relating to the CPHP. The Programme team who maintain update and web-manage this site are to be congratulated. In addition to the UK website each regional office has its own site and some projects (such as the DE cluster; see below) also have sites. A sample of the project leaders were asked to comment on the procedures and practices of the CPHP. Their responses are summarised in Annex 3.

## 4.9 CONCLUSIONS AND LESSONS LEARNT

### Programme Conclusions

The cassava cluster is a well constructed and well managed suite. It evolves from good quality “hard” science which has a good innovation and risk element, to a well planned and executed implementation phase in the region of need. It is conventional in its research-application-implementation linearity and the organisation and management have ensured its success.

The diatomaceous earths work within the CPHP is a major success story. It has excellent applied research credentials, good publications, good profile, and is award-winning. It evolves into a highly successful implementation phase and has the environmental, economic and social benefits rarely seen in so short a time from a piece of modern science. All involved are to be congratulated.

Although the rice cluster is not a “high science” study, and the solution to the problem turned out to be more in experimental development than research in the accepted sense, the cluster was nevertheless successful in terms of poverty reduction and is having a significant impact at local level.

The Innovation Systems cluster represents a major shift in the way research for development is conceived, commissioned, conducted and exploited. It is a brave and novel departure. The jury is still out on whether the benefits outweigh the costs but if proven successful the CPHP will have truly blazed a trail in the management of science.

### Key ingredients to the success of the programme

I believe that the CPHP has been a successful programme and the main ingredients for this success, in order of importance are:

- Good scientists doing good science
- A blend of strategic and applied research
- Long term planning
- Good programme management support
- Good links in region
- Good blend of dissemination media

### Lessons to be learned

DFID is to be congratulated on its foresight in having a ten-year programme. This gives time for a research topic to develop logically and mature into useful end products. However political shifts inevitably lead to paradigm shifts which destroy the advantages of the timescale. Such fundamental changes should be avoided, (though changes in government are bound to impact).

DFID should be clear of its requirements at the outset of any new programme, and ideally plot a course from strategic through to development work. It should choose the best scientists to carry out the work, regardless of their geographical location. In respect of post harvest science in the UK, the pool of expertise is already below critical mass and DFID should be prepared to “use it or lose it”.

## Research themes for the future

Existing themes. As the programme draws to a close, the themes studied have been:

- Reducing storage losses
- Food safety & nutrition
- Value through processing
- Access to markets
- Institutional arrangements

The order in which the themes are presented above demonstrate a number of key factors of the programme. The level of technical bioscience research decreases down the list. The level of socio-economic “development” increases down the list and the time taken to achieve an effect on the ground decreases down the list. It is clearly important to keep a balance of high tech research for long term solutions and short term quick fixes which can be achieved through non research means. I believe that the latter should be elements of the main DFID aid programme and not part of a strategic research programme. As far as crop post harvest science is concerned I would see the following as emerging priorities:

- Role of climate change (eg on pest species/treatment outcomes/viable technologies)
- Role of changing crop profiles
- Role of non-food crops, (eg starches)
- Role of natural products (eg natural pesticides/antimicrobials both for post harvest use and for commercial exploitation)

In relation to the existing themes I would expect food and nutrition to continue to be important as a research issue, and if the three “development” themes were to be absorbed into mainstream aid programmes, new themes as indicated above could form a useful basis of a new strategic research programme.

## 4.10 KEY RESOURCES

### Useful documentation

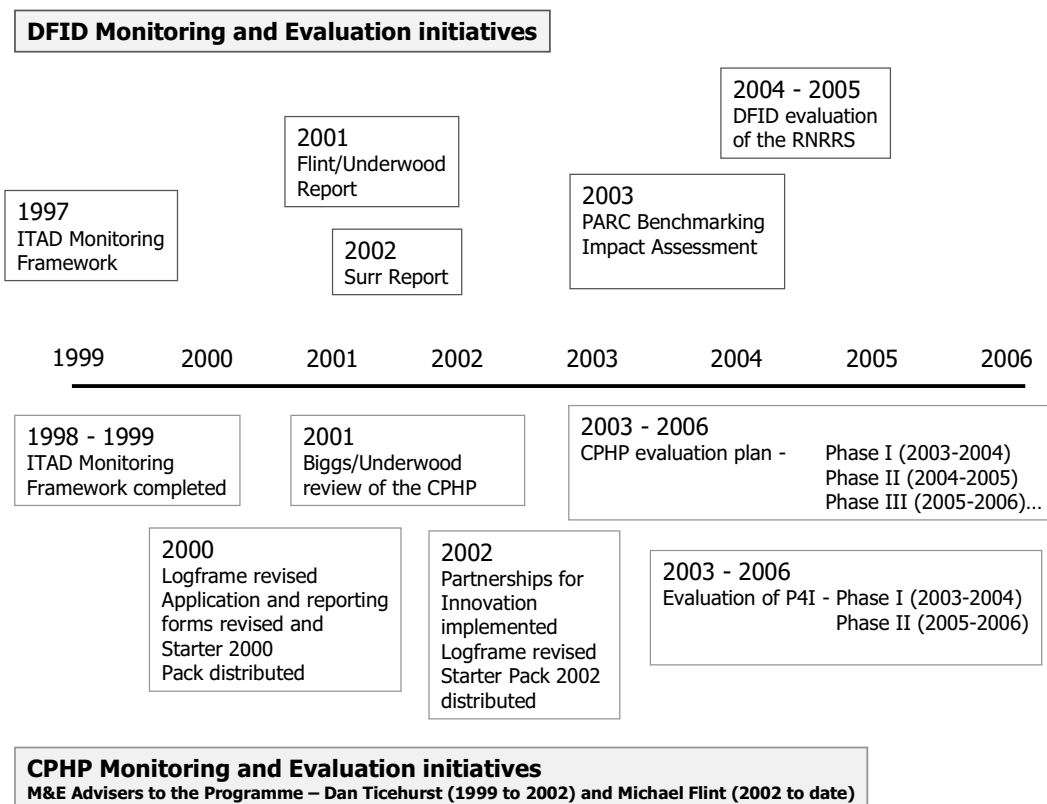
The most useful documentation for me in compiling my full Specialist report on the CPHP was a CD compiled by the Programme Manager and his team. It contained:

Logframes, thematic reviews, recent other reviews, indicators and milestones, issue papers, peer reviewed outputs and other relevant documentation. Essential reading of course were the individual project reports, CPHP Annual Reports, Renewable Natural Resources Research Strategy 1995-2005 Final Report. Clearly the logframe documents were vital in assessing project outcomes against expectation, though as outlined above I have reservations about the value of this approach. The CPHP website was an excellent starting point for much of the information needed. The weight of documents read was in excess of 1kg and was supplemented with the content of 6 CDs. I was surprised that programme managers had not been tasked by DFID with producing a summary evaluation report to an agreed template, style, length etc. as has been the case in other reviews I have been involved in. Source material used in the evaluation is listed in Annex 4.

## Annex 1. CPHP Projects selected for review

RLD R No.	Short Title	Lead Organisation	Collaborating Organisations	Region	Theme	Project Leader	Start date	End date	Years	Total budget £
<b>Cluster 1</b>										
<b>OPPORTUNITIES FOR CASSAVA</b>										
R6504	Expanded markets for locally produced cassava flours and starches in Ghana.	NRI	PHDU MoFA, FRI	West Africa	value thru processing	A Graffham	Jan-96	Mar-99	3	189,250
R7418	Development of new market opportunities, to increase the contribution that cassava makes to sustainable Rural livelihoods.	NRI	FRI, FRIG, Univ Ghana	West Africa	access to markets	A Graffham	Jul-99	Jun-02	3	309,190
R8268	Sustainable uptake of cassava as an industrial commodity	FRI,Ghana & NRI,UK	Amesa-Agro-Processing Co.Ltd, Ghana; Feed & Flour LTD, Ghana; Roseafrik Ltd, Ghana; APED, Ghana; FORIG, Ghana; MoFA, Sunyani; NBSSI, Ghana; UoGhana; Bakers associations, Atabubu; Cassava Processing groups and farmers in Atabubu	West Africa	access to markets	N Dziedzoave (FRI) & AJ Graffham (NRI)	Jan-03	Dec-04	2	207,260
<b>Cluster 2</b>										
<b>DIATOMACEOUS EARTHS</b>										
R6312	The use of non-conventional methods for protecting cereals and pulses during storage against insect pests	NRI	Crop Storage Unit, Ministry of Agriculture, Malawi	Southern Africa	reducing storage losses	P Golob	Apr-95	Mar-96	1	48,280
R7034	Grain Storage Pest Management Using Inert Dusts	NRI	PPRI, IAE, Agriflex etc.	Southern Africa	access to markets	T Stathers	Oct-97	May-00	2.5	151,930
R8179	Utilisation of diatomaceous earths	NRI, UK	Min of Agric & Food Security, Tanzania; University of Zimbabwe; Diatom Research and Consulting, Canada; Insti of Agricultural Engineering, Zimbabwe; Agriflex, Zimbabwe; EcoMark Ltd, Zimbabwe	Southern Africa	reducing storage losses	T Stathers	Apr-02	Mar-05	3	300,570
<b>Cluster 3</b>										
<b>IMPROVING RICE MARKETABILITY</b>										
R6888	Ghana: Improving the Competitiveness and Marketability of Locally Produced Rice in Ghana vis-a-vis Imports of the Commodity into the Country	NRI	ISSER, FRI, UoG, CSIR	West Africa	value thru processing	J Conway	Apr-96	Feb-99	3	210,910
R7531	To Determine Post-harvest Practices for Rice, Particularly those Associated with Small scale Milling, in Tanzania	NRI	Min of Agric & Co-ops, Tanzania	East Africa	value thru processing	L Hammond	Jan-00	Mar-01	1	58,523
R8263	Improved rice post-production & marketing technologies in Northern Ghana	FRI, Ghana & NRI, UK	NRI, UK; DAE, UGL, Ghana; ADRA, Ghana; Technoserve, Ghana; MoFA, Ghana	West Africa	access to markets	J Mantul	Jan-03	Dec-04	2	152,380
<b>Cluster 4</b>										
<b>INSTITUTIONAL ARRANGEMENTS</b>										
R7502	Optimising institutional arrangements for demand-driven post-harvest research, delivery, uptake and impact on the livelihoods of the poor through public and private sector partnerships	NRI/Univ. of Strathclyde	NCAP, India; ICRISAT, India	South Asia	institutional arrangement	Hail & N Clar	Oct-99	Sep-02	3	342,050
R8310	Institutional learning and change - a capacity development approach to exploring and strengthening post-harvest innovation systems in South Asia	Livelihood solutions, India; NCAP, India	National Institute of Science, Technology and Development Studies (NISTADS); NRI; University of Strathclyde	South Asia	institutional arrangement	R Sulaiman Guru Nalk	Aug-03	Dec-04	1.4	84,310

## Annex 2. CPHP, DFID and CPHP Monitoring and Evaluation Initiatives



### Annex 3 CPHP Comments From Project Leaders

In discussion with the Programme Manager a sample of 23 CPHP Project Leaders were e-mailed with a short questionnaire. Four e-mails were returned undeliverable, but of the remaining 19, 8 replied in time for this evaluation. The questions asked were mainly organisational and were:

- Q1. *What is your view of the commissioning process? (e.g. is it streamlined, efficient, bureaucratic, etc)*
- Q2. *What scope is available for scientific novelty and innovation?*
- Q3. *How effective is the monitoring process? (e.g. seamless, intrusive, overbearing)*
- Q4. *What is your view of the reporting process (e.g. fits in well with the science, too many different report formats, overmanaged)*
- Q5. *Any other comments?*

*A précis of comments received, (one reply ran to 34 pages!) are as follows and are unattributed:*

- Q1. *What is your view of the commissioning process? (e.g. is it streamlined, efficient, bureaucratic, etc)*

One respondent said that over the whole lifetime of the programme, the impression was that it had fairly clear scientific/developmental objectives, and that it addressed these reasonably effectively. The mechanism for submitting concept notes, and then developing more detailed project memoranda was straightforward, efficient and transparent. The respondent was, however, much less impressed with the system developed in the last 2-3 years of the programme.

The respondent believed that the system has become much less efficient, employing a larger number of staff. Very simple concepts such as the value of having truly collaborative projects were presented as new and novel requiring training workshops where the ideas were wrapped up in “development speak” and “jargon”.

The respondent also felt that in this process NRI and its long established overseas contacts were discriminated against in favour of “new kids on the block”

One respondent felt that the introduction of Coalition projects had made the process much more complex. Although the programme was now encouraging overseas partners to run projects it was felt that often the expertise to do so resided in UK. A number of respondents commented that they could not recover the increased costs of putting a project together (e.g. travel cost to attend meetings with overseas project leaders).

Another respondent said “the current model of research commissioning is expensive for bidders and to DFID – is this the best use of resources? In 1999/2000 NRI spent at least £241,000 bidding for CPHP funds, which equates to ca. 10% of the value of the programme. The programme itself would have spent a considerable proportion of its management time dealing with this process. Whilst recognising the need for open competition this is clearly an expensive process.

There was considerable concern amongst UK-based respondents that the way in which NSI was implemented impacted badly on their ability to participate or contribute. Examples given were:

- the programme guided coalitions (in writing) that UK inputs were to be made on a needs only basis – ie UK institutions were not considered as partners but as service providers. When challenged this guidance was changed, but too late.
- key project development workshops were organised by Regional Coordinators to which NRI staff with long standing connections to the work were not invited.
- coalitions were encouraged to take on UK partners as consultants rather than as partners and in one case a CPHP consultant briefed local staff against use of a specific NRI staff member.
- NRI were told in one region that they could not be involved in project leadership when in other regions they could – a decision that was subsequently changed – but too late.

Another respondent agreed that the recent changes in the commissioning process had major drawbacks. These included the increased cost of preparing a proposal, the inadequate experience of trainers taken on to explain the process, the impenetrability of the guidance documentation, the lack of feedback and QA procedures within CPHP, and errors in the documentation.

*Q2. What scope is available for scientific novelty and innovation?*

Several respondents felt that since the implementation of the Innovation Systems approach there was less opportunity for innovation and risk taking, and one commented that the process was becoming more important than the research.

Several respondents also felt that the research had become too “adaptive” and focused only on impact.

Another respondent commented “My impression is that the opportunities available for UK academics to help shape the programme in innovative ways may have declined recently. I appreciate the importance of decentralising the programme to focus regions and the need for a dissemination emphasis, but wonder whether this may be also encouraging a tendency to stick with the tried and tested at the expense of more innovative research?”

Several UK-based respondents felt that the new approach was “throwing away the baby with the bath water” in terms of existing north-south relationships forged over many years (mainly by NRI). There was a distinct feeling amongst NRI respondents that the programme had become “anti-NRI”. As an example one respondent said “I would suggest that the innovations systems approach adopted by the CPHP in the last few years has failed to recognise the subtly, (sic) and chemistry of the relationships and in many cases has put pressure on existing relationships.”

Another respondent said “The scope for scientific novelty and innovation was initially high in the programme and I found the logframe approach useful in providing a set of higher level objectives in which to set particular pieces of work. This has declined significantly in the latter stages of the Programme implementation when there was a move to dissemination and I felt that we were taking part in a large research project on innovation systems rather than trying to undertake post-harvest research.”

Contrary to this an overseas project leader said “The coalition approach by itself provides scope for innovation and doing things differently. For us, while we have worked with partners and multiple stakeholders in several projects, the CPHP has indeed been different in its very approach of jointly planning and implementing research projects.

*Q3. How effective is the monitoring process? (e.g. seamless, intrusive, overbearing)*

One respondent felt that project leaders should be more accountable and be required to present their work in front of a panel of evaluators. In general respondents were satisfied with this aspect of CPHP

*Q4. What is your view of the reporting process (e.g. fits in well with the science, too many different report formats, overmanaged)*

All respondents were generally happy with the reporting process.

*Q5. Any other comments?*

One respondent felt that DFID (and particularly policy-forming staff at HQ) should have been following up on the research it had been funding to see if the findings had implications for current policy, or to see how the findings were being taken up and used elsewhere. In practice the respondent had found the policy-forming relevant staff to be practically inaccessible for any form of dialogue about the implications of the important area of work, and that there is not much institutional memory.

On the issue of Coalition projects one respondent said “A consequence of the coalition approach to projects is that in many cases developing country scientists (rather than their institutions) are bidding for UK funds for their own benefit. While this offers good incentives to be involved with projects, it creates problems of rivalry, accountability and sustainability.

One respondent felt that all aspects of CPHP worked well and that it should continue in some form. Most felt that the reporting, monitoring and commissioning processes worked well.

## **Conclusions**

It is clear that the Innovations Systems approach to the operation of CPHP provoked the most comment. My reading of this is as follows:

Those based in traditional providers in the UK, felt that NSI was unproven and expensive with no obvious benefit. They also felt that the quality of science had been simultaneously reduced. Although there has clearly been a shift, (as much debated by the Evaluation Team for all programmes) from “hard” life science to “soft” socio-economic science, there is little evidence that the quality of output has declined; simply that the nature of those outputs has changed. Criticism of CPHP or the RNRRS as a whole on the basis that it is trying too hard to focus on impact, which is, after all its sponsor’s main aim, seems contrite.

Interestingly the single overseas respondent felt that the change had been a significant improvement.

It is clear that the jury is still out on NSI and its proponents have some way to go to demonstrate clear benefits, especially to those (mainly UK-based) respondents who feel somewhat disadvantaged by it.

## Annex 4 CPHP Source Material

### On CD

- Socio-Economic Methodologies Programme 1995-2000. Best Practice Guidelines
- RNRRS CPHP Annual Reports 2000-2001
- RNRRS CPHP Annual Reports 2001-2002
- RNRRS Annual Reports 2002-2003
- RNRRS Annual Reports 2003-2004
- RNRRS CPHP Annual Reports 1995-6
- RNRRS CPHP Annual Reports 1996-7
- RNRRS CPHP Annual Reports 1997-8
- RNRRS CPHP Annual Reports 1998-9
- RNRRS CPHP Annual Reports 1999-2000
- Final technical reports (FTR) for all completed evaluated projects
- Independent Reviews of FTR where available
- 2 Thematic reviews
- PAC review
- Geographical focus: internal report
- Livelihoods and poverty: internal report
- Reporting Monitoring and Review of Research Projects (See Annex 3)
- A brief summary of the lessons learned from the Crop Post Harvest Programmes'
- "Partnership for Innovation" approach By Andrew Barnett, Sussex Research Associates Limited, Brighton 29th October 2004
- Some New Ideas About Research for Development
- Erik Arnold, Technopolis, UK; Martin Bell, SPRU-Science; Technology Policy Research, UK
- Review of the crop post harvest research programme: partnerships and innovation Systems. Stephen Biggs and Mary Underwood 2001
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**Output Documents**

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- Diatomaceous Earth website: [www.nri.org/de/](http://www.nri.org/de/)

**R7418**

- Global Cassava Market Study
- Use of Cassava Flour in Paperboard Adhesives
- The Combination of Rice Malt and Amyloglucosidase for the Production of Sugar Syrup from Cassava Flour.
- Evaluation of beta amylase activity in selected Ghanaian varieties of sweet potato.
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- Cassava Chip Business Plan
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- A Dynamite idea; The Economist June 2nd 2001
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**Annex 5. DFID CROP POST-HARVEST PROGRAMME LOGFRAME (2002-2005)**

NARRATIVE SUMMARY	INDICATORS OF ACHIEVEMENT	MEANS OF VERIFICATION	RISKS AND ASSUMPTIONS
<p><b>SUPER GOAL</b> Poverty eliminated in poorer countries through sustainable development</p> <p><b>GOAL</b> Livelihoods of poor people improved through sustainably enhanced production and productivity of RNR systems.</p> <p><b>PURPOSE</b> National and international crop-post harvest innovation systems respond more effectively to the needs of the poor.</p>			
	<p>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.</p>	<p>Project evaluation reports. Regional Coordinators' Annual Reports. CPHP Annual Reports. CPHP Review 2005. Partners' reports.</p>	<p>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.</p> <p>National and international delivery systems deliver a range of services relevant to poor people in both focus and non-focus countries.</p> <p>Livelihood analysis provides accurate identification of researchable constraints or opportunities that lead to poverty reduction.</p>

NARRATIVE SUMMARY	INDICATORS OF ACHIEVEMENT	MEANS OF VERIFICATION	RISKS AND ASSUMPTIONS
<p><b>OUTPUTS</b></p> <p>1. Strategies are developed, which improve food security of poor households through increased availability and improved quality of food crops and better access to markets.</p> <p>2. Strategies to improve security of poor households are effectively promoted.</p>	<p>1.1 By 2005, a total of &gt;5 improved on-farm storage systems, or recommendations for crop breeders, that sustainably improve food security and/or smallholder incomes are developed and validated for cereal, legume and root crops in at least 2 regions.</p> <p>1.2 By 2005, a total of &gt;5 new small-scale agro-processes or improved traditional processes are developed and validated that meet market opportunities and are capable of reducing labour requirements and/or sustainably increasing smallholder incomes from food crops in at least two regions.</p> <p>1.3 By 2005, a total of &gt;5 improvements to marketing, market access, handling and credit systems are validated that are capable of sustainably increasing smallholder incomes from food crops in at least two regions.</p> <p>1.4 By 2005, a total of &gt;5 improved and sustainable management, food safety and quality systems are developed and validated for foods important to the livelihoods of the poor in at least two regions.</p> <p>1.5 By 2005, research has identified how post-harvest interventions can be applied by national/ international post-harvest innovation systems that interface with the poor in four regions.</p> <p>1.6 In period 2002-2005, &gt;75% of new research projects are led by national organisations in four regions.</p> <p>1.7 In period 2002-2005, &gt;75% of new research projects are implemented through coalitions of relevant partners in four regions.</p> <p>2.1 By end 2002, coalitions are established in four regions which, between them, represent uptake pathways for at least 50% of programme research outputs requiring additional promotion.</p> <p>2.2 By end 2003, coalitions in four regions are, between them, validating/ adapting/ applying at least 50% of programme research outputs requiring additional promotion.</p> <p>2.3 By 2005, coalitions in four regions are, between them, validating/ adapting/ applying at least 90% of programme research outputs requiring additional promotion.</p> <p>2.4 In period 2002-2005, &gt;75% of new promotion projects are led by national organisations and implemented through coalitions of relevant partners.</p>		

Footnote 1: Research outputs include technologies, protocols, policy recommendations and new forms of social organisation which have the potential to benefit poor producers and consumers. They will be screened for potential social, economic and environmental impacts of wide-scale adoption.

Footnote 2: Stable climate, physical, political and economic conditions and international relations (as they affect staff mobility, communications, institutional relationships, financial or other incentives, access to equipment, staff and working capital).

Footnote 3: Institutional mandate, credibility, skills, track record, human, financial and physical resources, equity and extent of outreach amongst the poor.