

Natural Resources Research Evaluation Synthesis



DEPARTMENT FOR INTERNATIONAL DEVELOPMENT

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NATURAL RESOURCES RESEARCH EVALUATION SYNTHESIS

A SYNTHESIS OF EVALUATIONS OF THREE TECHNOLOGY
DEVELOPMENT AND RESEARCH PROJECTS IN THE RENEWABLE
NATURAL RESOURCES SECTOR

by

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In May 1997 the Overseas Development Administration (ODA) was replaced by the Department for International Development (DFID). References in this report to the ODA apply to events, actions, etc prior to the changes of title and functions.

The opinions expressed in this report are those of the author and do not necessarily represent the views of the Department for International Development.

Preface

Each year the Department for International Development (DFID) commissions a number of ex post evaluation studies. The purpose of the DFID's evaluation programme is to examine rigorously the implementation and impact of selected past projects and to generate the lessons learned from them so that these can be applied to current and future projects.

The DFID's Evaluation Department is independent of DFID's spending divisions and reports directly to the DFID's Director General (Resources).

Evaluation teams consist of an appropriate blend of specialist skills and are normally made up of a mixture of in-house staff, who are fully conversant with DFID's procedures, and independent external consultants, who bring a fresh perspective to the subject-matter.

This evaluation is a synthesis of the following three evaluation studies:

- (i) DDT Impact Assessment Project, Zimbabwe (DDTIA) - EV602
- (ii) Whole Crop Harvester (WCH) - EV590
- (iii) Pheromones EV578

It also makes use of 18 ODA Project Completion Reports (see Annex C), 4 ODA research reviews, and a limited amount of material from international agricultural research institutes. It is not a comprehensive review of all recent ODA assistance for NR-related activities, nor is it a review of current DFID policy towards the sector, which has undergone considerable change since the ODA projects considered here were designed. Similarly it does not seek to assess either ODA's influence in international conferences or ODA aid passed through multilateral donors.

The evaluation process involved the following stages :-

(a) For each individual project evaluation:

- initial desk study of all relevant papers;
- consultations with individuals and organisations concerned with the project, including a field mission to collect data and interview those involved;

- preparation of a draft report which was circulated for comment to the individuals and organisations most closely concerned; and (except for the DDTIA study);
- submission of the draft report to the DFID's Director General (Resources) to note the main conclusions and lessons to be learned from the study on the basis of the draft report;
- for the DDTIA study, meeting of DFID's Projects and Evaluation Committee with Evaluation Department and the author to discuss the main conclusions and lessons to be learned from the study on the basis of the draft report.

(b) For the synthesis study:

- preparation of the synthesis report which seeks to draw out the main points from the individual reports and identify the key lessons learned;
- meeting of DFID's Projects and Evaluation Committee with Evaluation Department and the author to discuss the main conclusions and lessons to be learned from the study on the basis of the draft report.

This process is designed to ensure the production of high quality reports and (EVSUM) Summary sheets which draw out all the lessons.

DFID Evaluation Department

ACRONYMS AND ABBREVIATIONS

| | |
|-------|---|
| ACIAR | Australian Centre for International Agricultural Research |
| CGIAR | Consultative Group on International Agricultural Research |
| DDT | Dichlor-diphenyl-trichlorethane |
| DDTIA | DDT Impact Assessment Project |
| EOPR | End-of-Project Review |
| ESCOR | Economic and Social Research |
| IAEG | CGIAR's Impact Assessment and Evaluation Group |
| IARCs | International Agricultural Research Centres |
| IMP | Impact Monitoring Plan |
| IPM | Integrated pest management |
| ITAD | Information, Training and Agricultural Development Ltd |
| MTR | Mid term Review |
| NARP | (Kenyan) National Agricultural Research Project |
| NRED | Former Natural Resources and Environment Department |
| NRI | Natural Resources Institute |
| NRRD | Natural Resources Research Department |
| OPR | Output-to-Purpose Review |
| PCR | Project Completion Report |
| PIMS | Policy Information Marker System |
| R & D | Research and Development |
| RNR | renewable natural resources |
| RNRRS | Renewable Natural Resources Research Strategy |
| TC | Technical Cooperation |
| TDR | Technology, Development & Research |
| TORs | Terms of Reference |
| TTCB | Tsetse & trypanosomiasis Control Branch (in the Zimbabwe Government's Veterinary Services Department) |
| WCH | Whole Crop Harvester |

SUMMARY AND LESSONS LEARNED

1. This report presents a summary of the findings of ex post evaluation studies of three ODA renewable natural resources (RNR) research projects. All three projects pre-date the 1994 Renewable Natural Resources Research Strategy (RNRRS).

Table 1

| Project | Dates | Cost (£m) | Funding |
|---|--------------|------------------|----------------|
| DDT Impact Assessment Project, Zimbabwe (DDTIA) | 1987-92 | 0.9 | TC |
| Whole Crop Harvester (WCH) | 1985-89 | 0.8 | TC + central |
| Pheromones | 1981-95 | 3.8 | TC + central |

2. Findings from the Project Completion Reports (PCRs) for eighteen research projects financed from bilateral country programmes, and from four research reviews, are also summarised. Very few comparable evaluation studies were identified from other donors.

MAIN FINDINGS

Overall performance

3. Two of the three evaluated projects were rated as **partially successful**. Both DDTIA and Pheromones achieved considerable technical success but did not achieve the intended impact on policy and practice. The major pheromones project in Egypt, however, achieved a major impact. The WCH project was **largely unsuccessful** (2.7-9).

4. In general, the research projects succeeded in achieving the scientific outputs but were less successful in translating these outputs into uptake and impact (2.10-11).

5. According to the PCRs, most of the bilateral country research projects largely achieved their outputs. The assessments of achievement at Purpose and Goal level are less reliable. Ratings were generally favourable (3.5-6).

Impacts

6. Table 2 below summarises the impacts as identified and rated by the evaluators. The scientific impact was generally very high (2.25-26), as was the health, environmental and institutional impact for the pheromones programme (2.17, 2.19, 2.23). Impact on poverty was limited or nil for these three projects (2.13-15).

Table 2 : SUMMARY OF IMPACT AND SUSTAINABILITY FINDINGS¹

| Impact category | DDTIA | WCH | Pheromones - Egypt | Pheromones - All |
|------------------------------|--------------|------------|-------------------------------|-----------------------------|
| Poverty | - | - | C | C |
| Productive capacity | - | C | B | C |
| Health | D | - | A+ | B |
| Environment | C | - | A+ | B |
| Women | - | - | - | - |
| Institutional | - | - | A | A |
| Technical / scientific | A | C | A | B |
| Financial sustainability | - | C | B | B |
| Institutional sustainability | - | C | B | B |
| Overall sustainability | - | B | B | B |

7. The sustainability of many of the bilateral research projects was judged to be questionable (3.6). The sustainability of the pheromones programme in Egypt has been good so far but could be threatened (in the absence of appropriate policies) by the liberalisation of the cotton sector (2.29) and by insufficient promotional and educational activities. The impacts of DDTIA and WCH should be sustained, albeit not, in the case of WCH, for the benefit of developing countries (2.30-31).

¹ A+ = very significant overall benefits in relation to costs.

A = significant overall benefits in relation to costs.

B = some significant overall benefits in relation to costs.

C = few significant benefits in relation to costs.

D = no significant benefits in relation to costs; project abandoned.

- = nil or not applicable

Explanatory factors

8. The following factors contributed to the observed impact in the three projects:
 - high quality research staff
 - demand from local partner institutions
 - contact and interaction with UK institutions.
9. The following factors explain the lack of impact, particularly at Purpose and Goal level :
 - lack of clear objectives, understood by all stakeholders
 - insufficiently long funding period
 - insufficient consideration of the institutional and policy conditions for uptake
 - insufficient socio-economic inputs , poorly integrated with technical research
 - poor management of the commercialisation process.
10. The importance of ensuring local 'ownership' was the most important contributor to success in the bilateral research projects reviewed. A failure to consider, or respond appropriately to, local institutional conditions was the most common negative factor (3.7).
11. A review of ODA bilateral country support to forestry research came to similar conclusions. Some highly relevant and useful results were produced but, in general, project objectives were poorly defined; stakeholders and end-users were not identified and involved; research was supply- rather than demand-led; and the fact that most of the projects were, or should have been, primarily institutional development projects was under-appreciated (3.19).

Other evaluation findings

12. Apart from one ESCOR study, no evaluation of research other than in the RNR sector has been undertaken by ODA/DFID (3.12). No evaluation reports by other donors were identified which went as far as developmental impact. Because of the costs and difficulties involved, most have not attempted to measure anything beyond adoption and immediate effects (4.2).
13. Studies by the Australian Centre for International Agricultural Research (ACIAR) confirm the potentially high economic rate of return to research. They also demonstrate that economic impact assessments are possible if the skills and resources are made available (4.5).

14. A recent review by the Consultative Group on International Agricultural Research (CGIAR) of 87 ex post impact assessments concluded that there was a need for systematically and reliably collected information on intermediate products and indirect outcomes (4.6). At present, very little is known about the impact of CGIAR research on end-users, food security, poverty or natural resources. Until relatively recently, assessment of CGIAR and other research programmes tended to be limited to a peer review of scientific aspects. This is now changing.

15. The same can be said of the ODA (now DFID) research programme. The evaluations and reviews reported here are an insufficient basis for either accountability or lesson learning (4.10).

DFID research management

16. The RNRRS research management guidelines already incorporate most of the lessons contained in these evaluation studies and reviews (5.5). There is scope for reviewing and/or expanding guidance relating to commercialisation (including intellectual property rights), policy research, institutional issues and risk assumptions (2.11, 5.6).

17. More generally, there is a need to review the adequacy and effectiveness of the guidance in practice. There may also be benefit in expanding and clarifying guidance in a separate 'best practice' note, possibly incorporating all the lessons learned to date from the central and bilateral RNR research programmes. This should be disseminated to all DFID staff, institutions, and consultants involved with RNR research (5.6).

18. A best practice guidance note would be of benefit to bilateral country research projects, for which no specific guidance currently exists (5.3).

19. Impact assessment remains a major challenge for RNR research, both within the RNRRS and the bilateral programme. Although difficult and expensive, it has to be given higher priority (5.10-14). Action has been taken within the RNRRS, but there remains a need for a more systematic and strategic approach to research evaluation for RNR research, and for other DFID Technology Development & Research (TDR) programmes. This will require central coordination and support (5.16-18).

LESSONS LEARNED

20. Lessons learned from the studies and reports are summarised below. Those specific to particular projects have been excluded. As already stated, many of these are already adequately reflected in current RNRRS guidance.

Stakeholder participation

- Stakeholder and end-user demand needs to be clearly assessed as part of research appraisal and uptake planning;
- potential end-users need to participate in research; conventional supply-led approaches to developing technologies are unlikely to be effective for producers with limited resources in developing countries;
- research which is demand-led by one particular stakeholder still needs to be designed with the participation of all stakeholders; appraisal needs to ascertain that there is a wider demand and constituency for the research, and that it is likely to meet all the major stakeholders' requirements;
- communication between stakeholders is important, especially where DFID will not wish to fund the entire research and development cycle;
- projects are more likely to succeed if local 'ownership' of the project is promoted, such as by having a pre-project preparation stage, by disbursing operating funds through the local system, or by a partnership approach to monitoring.

Socio-economic and institutional inputs

- Substantial resources may be required to identify and enable the social and institutional conditions appropriate for uptake;
- technical research must be responsive to, and integrated with, socio-economic research;
- more and earlier socio-economic work, including market research, is often needed to understand the strategy and conditions required for uptake by farmers and pest control agencies;

- many research projects, particularly those financed from bilateral country programmes, should be seen also as institutional development projects and need to be designed and managed as such.

Monitoring and evaluation

- Research projects need clearly stated objectives, assumptions, indicators, and monitoring and evaluation procedures;
- environmental or health impacts need to be reflected in monitoring and evaluation systems where they are an important part of project benefits;
- logical frameworks need to be kept up-to-date, fully shared with counterpart institutions, and used as monitoring tools.

Policy research

- Research that is intended to influence policy must involve careful appraisal of the existing policy context and trends and be explicit about the ways in which research can influence policy;
- existing knowledge must be critically examined to assess what new policy -relevant information might be expected;
- research into controversial issues is especially risky and requires particularly critical appraisal;
- the importance of factors peripheral to the main field of enquiry (eg. health impacts) needs to be assessed by appropriate specialists as part of project design; project designers need to ensure or verify that all the major concerns related to the RNR policy issue in question can be and are adequately addressed.
- conclusions and recommendations derived from research need to be clear, accessible and balanced if they are to influence policy. Adequate time and funds for the presentation and dissemination of project findings must be built into the design.

Commercialisation

- If aid-funded research is to result in commercialisation of a technology, this process needs to be actively managed rather than left to chance;
- project appraisal needs to consider the profitability and risk of the R&D investment from the point of view of potential commercial contractors;
- commercial expertise needs to be involved in the appraisal of research which is intended to be commercially exploited;
- potential commercial companies need to be involved from the outset.

Project Design

- TDR takes time; consideration should be given to longer duration projects;
- implementation needs to take account of new knowledge and techniques produced since the original project design;
- greater attention to the risks and assumptions at Output-to-Purpose and Purpose to Goal level is required if scientific outputs are to be translated into development impacts.

1

INTRODUCTION

1.1 The aims of this synthesis evaluation of three renewable natural resources (RNR) research projects are :

- to disseminate within DFID and elsewhere the findings and lessons learned primarily from three evaluations of RNR research projects;
- thereby to help enhance the effectiveness of DFID's support for technology development and research (TDR) in bilateral country programmes and the centrally-funded programmes.

Detailed Terms of Reference (TORs) are at Annex A.

1.2 The study concentrates on the findings of three ODA evaluation studies. Two were funded from a mix of central RNR research funds and bilateral Technical Cooperation (TC) funds. One was solely TC funded. All three projects pre-date the 1994 Renewable Natural Resources Research Strategy (RNRRS). Use is also made of 18 recent Project Completion Reports (PCRs) of research projects funded under the bilateral programme. Other ODA and DFID evaluation or impact assessment material on Technology Development and Research (TDR) projects is limited. That identified for other donors is even more so. The net result is an evaluation synthesis study of more limited scope than is normal or was intended.

1.3 It is recognised that DFID now handles centrally funded RNR research in a very different way since the RNRRS, and also that the concept of good management practice is evolving rapidly. NRRD has, for example, recently embarked on a substantial impact monitoring exercise for the RNRRS. This report aims to summarise the available evaluation material as a contribution to the evolution of research management practice within DFID.

2

DFID EVALUATION FINDINGS

Introduction

2.1 This section summarises the evaluation findings of three very different ODA-funded research projects/programmes :

- DDT Impact Assessment Project, Zimbabwe (DDTIA)
- Whole Crop Harvester (WCH)
- Pheromones

2.2 Both the WCH and the Pheromones projects were funded through a combination of central Research and Development (R&D) and bilateral TC funding. The central R&D funds were in these cases financing the continuation of work previously undertaken by the scientific institutes concerned under core grant arrangements which have since been gradually phased out. The DDTIA project was entirely TC funded.

2.3 The general objective of the DDTIA project was to produce a better understanding of the environmental costs of using DDT for ground spraying against tsetse fly in Zimbabwe. The intention was that this would inform and improve tsetse control policy. The project was implemented by ODA between 1987 and 1992 by three Natural Resources Institute (NRI) scientists, and cost around £ 870,000.

2.4 The WCH is a tractor-mounted machine developed by Silsoe Research Institute. It was intended for countries in which wheat is a major crop and where the finely broken straw is an important animal feed. Between 1985 and 1989 ODA funded the design, construction and testing of a number of prototypes, latterly in Pakistan. A UK-based company took out a licence for the technology in 1987 and expects to market the machine in the Middle East. The total cost to ODA was around £750,000.

2.5 The Pheromone evaluation covered a group of 43 separate projects conducted by NRI from 1981 to 1995. ODA provided £ 3.8 million for 37 pheromone related projects over the period 1981-1995. Research related to cotton accounted for almost half the

expenditure, with projects in Egypt accounting for £ 1.4 million. Six other projects were commercially sponsored. The evaluation considered whether NRI had been successful in developing pheromone-based monitoring and control systems for insect pests, as well as developing an understanding of social and institutional factors affecting the adoption of such systems.

Overall performance

2.6 Table 1 below summarises the overall achievements of the projects. The scores for Outputs, Purpose and Goal represent an interpretation derived from the three evaluation reports.

Table 1 : OVERALL PROJECT ACHIEVEMENTS²

| Project | Outputs | Purpose | Goal | Overall success rating |
|---------------------------|----------------|----------------|-------------|-------------------------------|
| DDTIA | 2 | 3 | 5 | partially successful |
| WCH | 3 | 5 | 5 | largely unsuccessful |
| Pheromones - Egypt | 2 | 2 | 2 | successful |
| Pheromones - all projects | 2 | 3 | 4 | partially successful |

2.7 The table reveals a mixed record. The Pheromones programme has achieved considerable technical success overall, and has had a major impact on the pest management system for pink bollworm in Egypt . However, uptake of pheromone-based monitoring and control systems elsewhere has often fallen short of the potential.

² Outputs, Purpose and Goal level achievements are scored using the PCR rating system :

- | | |
|--------------------------------------|---|
| 1 = likely to be completely achieved | 4 = only likely to be achieved to a very limited extent |
| 2 = likely to be largely achieved | 5 = unlikely to be realised |
| 3 = likely to be partially achieved | X = too early to judge the extent of achievement |

The Overall Success Rating uses the following EvD rating system :

Highly successful (A+) = objectives completely achieved or exceeded, very significant overall benefits in relation to costs.

Successful (A) = objectives largely achieved, significant overall benefits in relation to costs.

Partially successful (B) = some objectives achieved, some significant overall benefits in relation to costs.

Largely unsuccessful (C) = very limited achievement of objectives, few significant benefits in relation to costs.

Unsuccessful (D) = objectives unrealised, no significant benefits in relation to costs, project abandoned.

- = Nil or not applicable

2.8 The DDTIA project was also judged as successful in terms of the immediate scientific objectives set, although it is unlikely to have a significant impact on tsetse control and policy. DDT use was phased out in 1990, two years before the project was completed.

2.9 The WCH project was largely unsuccessful. The WCH is unlikely to be manufactured or sold in Pakistan, and for DFID the investment has been unsuccessful. WCH sales elsewhere in the world are unlikely to be sufficient to cover all the research and development costs.

2.10 This mixed record is unremarkable. Research is risky. More interesting is the fact that most of the projects appeared to be substantially more successful at producing the Outputs, than at achieving the objectives at Purpose or Goal level. This observation must be qualified by pointing out that Logical Frameworks were created retrospectively by the evaluators - the validity of which can be challenged - and that the positioning of objectives at the different levels is necessarily a matter of judgement. It is also true that the degree of risk increases as one moves up the log-frame hierarchy: by definition, only the Outputs are within the control of project management. That aside, the conclusion that these research projects were generally successful at achieving the scientific outputs for which they were responsible but less successful in translating these outputs into uptake and impact, is an important one. One implication is that risks and assumptions at the Output-to-Purpose and Purpose-to-Goal levels need to be better identified and managed.

Impact and sustainability

2.11 Table 2 below summarises the impacts as identified by the evaluators. This table is based on the Evaluation Success Rating table contained in each report. All the projects predate the new objectives outlined in the 1997 White Paper on International Development, and indeed the priority objectives or aims set for the former ODA.

Table 2 : SUMMARY OF IMPACT AND SUSTAINABILITY FINDINGS³

| Impact category | DDTIA | WCH | Pheromones - Egypt | Pheromones - All |
|------------------------------|--------------|------------|-------------------------------|-----------------------------|
| Poverty | - | - | C | C |
| Productive capacity | - | C | B | C |
| Health | D | - | A+ | B |
| Environment | C | - | A+ | B |
| Women | - | - | - | - |
| Institutional | - | - | A | A |
| Technical / scientific | A | C | A | B |
| Financial sustainability | - | C | B | B |
| Institutional sustainability | - | C | B | B |
| Overall sustainability | - | B | B | B |

2.12 It should be emphasised that these ratings represent the judgement of the evaluators based on the information available. They are not derived from scientifically rigorous impact assessment studies. Baseline data were not available for any of the projects.

Poverty

2.13 Pheromones are unlikely to produce substantial cost savings on control inputs in the long term. The impact on rural poverty is therefore likely to be slight. The evaluators concluded that the distributional impact of pheromone-based technologies would be relatively neutral overall, even though large-scale farmers represent the most likely adopters in the short to medium term.

2.14 A UK-based company expects to manufacture the WCH in Poland. and to market it in the Middle East and the Mediterranean. The WCH will not be manufactured or sold

³ See footnote 1 on page 2 for rating system

in Pakistan nor in any other DFID priority developing country. The project will therefore not impact on poverty in poorer countries.

2.15 The DDTIA project is unlikely to have a significant impact on policy and practice in Zimbabwe. Its developmental value is judged to be slight, with no impact on poverty.

Productive capacity

2.16 The WCH project did not succeed in increasing productive capacity, which was its major aim. Only the Pheromones programme is expected to have any impact on productive capacity in poorer countries. Even in this case, productive capacity improves only marginally with pheromones compared with the conventional pesticides for which they are substitutes. Pheromones are also unlikely to produce substantial cost savings on control inputs in the long term.

Environment

2.17 The major impact of pheromones used for either control or monitoring is a reduction in pesticide use. With approximately 85% of the pesticide used in Egypt applied to cotton, the reduction in pesticide use in 1995 due to pheromones represented an overall reduction of about 40% of all insecticide applications in the country. It was not possible to determine the environmental effects of this substitution, not least because of the lack of baseline and monitoring data.

2.18 The DDTIA project achieved its objective of improving understanding of the environmental impacts of using DDT in ground-spraying against tsetse. However, because the project has not influenced policy decisions on the use of DDT or alternative insecticides, and because a resumption of DDT use is inconceivable if donors and NGOs are involved, no environmental benefits are expected.

Health

2.19 Health impacts were only investigated in detail for the pheromones project in Egypt. Given the very significant health problems associated with the use of pesticides in cotton, the substitution of pheromones for large quantities of pesticides is undoubtedly advantageous. The lack of any baseline data nevertheless prevents any definitive statement on the health impacts.

2.20 DDT is one of the safest pesticides ever developed with respect to human health. However, the possible effects of DDT on infants via contaminated breast milk remain a public issue. Given the slight coverage of this issue in the project, and the lack of policy influence of the project more generally, no health impacts are expected as a result of the DDTIA project.

Gender

2.21 Gender-specific health impacts were considered as part of the pheromones evaluation. In Egypt, adult males and children of both sexes are most directly involved in pesticide application, but food contamination from spray drift will affect the entire household. In Pakistan, men are responsible for pesticide application but women risk high exposure to insecticides when weeding crops. On balance, the health benefits from reduced exposure to harmful chemicals are probably gender-neutral.

2.22 As in the case of cotton insecticides, high levels of DDT have been found in mothers' breast milk. However, there is no suggestion that DDT is a possible health risk to women as well as infants. No gender-specific impacts are likely for this or the WCH project.

Institutional

2.23 The major pheromone projects have increased the institutional capability of cooperating institutions in the countries concerned. The evaluators found that the contact and interaction with NRI, as well as specific training, has been greatly appreciated.

2.24 No significant institutional benefits were noted in the case of the WCH or DDTIA projects. Apart from some informal transfer of engineering and research management skills, no training was involved in the WCH project. Some UK training was provided under DDTIA but in general, TTCB (the Zimbabwe Government's Technical branch concerned) did not benefit to any great extent from the presence of the DDTIA team.

Technical and scientific

2.25 Research carried out by NRI has made a major contribution to transforming pheromone technologies from a relatively novel technology to an accepted component

of integrated pest management (IPM) programmes in many parts of the world. Even where research has not led directly to uptake and impact, the knowledge produced and disseminated represents a valuable scientific resource for the wider development of IPM programmes.

2.26 The DDTIA project represents the most comprehensive study of its kind in the tropics and, while not conclusive in a number of areas, has produced substantial new scientific knowledge. The presentation and dissemination of project results to the scientific community (but not to policy-makers and NGOs) has been good.

Commercial

2.27 The original intention was that the WCH would be manufactured and sold by a commercial company in Pakistan. This did not happen but the technology has been licensed and taken up by a UK company. At the time of the evaluation no commercial sales had been made, although production and marketing plans were well advanced.

2.28 Significant commercial benefits have accrued to the main UK -based company which has collaborated with NRI on the pheromone work. Early and on-going research funded by ODA would have been beyond the resources of a small-medium sized company, and would probably have not interested a large multinational company because of the small size of the market. ODA research has therefore been instrumental in the successful commercialisation of a technology with wide environmental and health benefits.

Sustainability

2.29 Pheromones are still being applied to the cotton crop in Egypt eight years after the project ended. The major threat to the sustainability is the liberalisation of the cotton sector. The end of centralised control poses a significant risk to pheromone-based control programmes, if not accompanied by policies designed to encourage the continued use of pheromones. Insufficient awareness among decision-makers and farmers about the environmental and health benefits of pheromones may limit the sustainability of pheromone programmes more generally.

2.30 The scientific contribution of the DDTIA project is sustainable. The DDTIA findings would be an important source of information should DDT use ever be reconsidered in Zimbabwe or elsewhere in the tropics.

2.31 The WCH project will have a sustainable impact - albeit not for the intended target group or country - provided the UK company is successful in producing and selling the machine.

Project management factors

2.32 The sections which follow analyse the important features of design, appraisal and implementation which have contributed to the observed impact, or lack of it. The projects evaluated were largely desk-funded bilateral technical co-operation projects, and were subject to the normal procedures then in operation.

Research objectives

2.33 At no stage of the WCH project was a set of common objectives, priorities, roles and responsibilities agreed upon by all the stakeholders. This was a major deficiency and made the effective monitoring of progress very difficult.

2.34 Research projects need to be designed and managed with reference to clear objectives at the Purpose and Goal level. While both the DDTIA and Pheromones projects were effective at achieving the Outputs, it can be argued that a greater focus on the higher level objectives - which normally involve uptake, implementation and impact - might have resulted in rather different, and ultimately more effective, research projects. In the DDTIA case such a focus would have included more serious consideration of the 'no project' option.

Funding period

2.35 The short period of research funding was cited as a negative factor in the Pheromones and WCH evaluations. In some of the pheromones projects, the short period of funding encouraged a concentration on technical aspects. A wider focus on how agro-environmental problems could be solved, and/or how pheromone technologies could be implemented, requires longer term funding.

2.36 In the case of the WCH, the short time horizons associated with annual funding probably worked against the development of a planned programme of work. Short time horizons also reinforced a tendency to concentrate on WCH's technical problems.

2.37 The DDTIA project lasted for three years. However, even this is a relatively short

period of time in which to research complex natural systems and the dynamics of populations which fluctuate over very long periods.

Researcher quality

2.38 The high quality of the scientific research carried out by NRI and counterpart staff has been the major reason for the technical achievements of the pheromones and DDTIA projects.

Demand

2.39 Great stress is now placed on ensuring that research is demand-led. Demand from collaborating institutions and scientists appears to have been strong in all the pheromone projects reviewed. The DDTIA project was also genuinely demand-led. A clear demand for the research contributed to the scientific impact and, in the case of pheromones at least, to the reported institutional benefits.

2.40 It is clear, however, from the outcomes of these projects that evident demand is a necessary but insufficient condition for uptake and impact. In the case of the DDTIA project, demand came from only one institution, the TTCB. Other important stakeholders were not directly or sufficiently involved, which weakened the policy acceptability of the findings. In the case of pheromones, demand from a limited group of counterpart technicians was no guarantee that eventual monitoring and control programmes could or would be implemented .

Institutional and policy conditions

2.41 The pheromone evaluation concluded that insufficient attention had been given to the social and institutional outputs which were essential for implementation of the technologies developed. For example, the obstacles to implementing pheromone-based control technologies in Pakistan are considerable, but no significant effort was made to address or plan for this reality. Similar concerns apply in the case of monitoring systems. If the end-users of monitoring systems are control authorities which are inadequately equipped or organised, the full impact of pheromone technologies is unlikely to be realised. Research was not discontinued in these and other cases where there was no likelihood of uptake.

2.42 Despite the excellent scientific research carried out under DDTIA, the project is unlikely to have a significant impact. One reason for this is that Zimbabwe government policy was already turning against DDT before the project was approved. In these circumstances, consideration of exactly how the DDTIA project would contribute to policy, and of the risks/assumptions associated with this, should have been more explicitly considered. DFID advisers have argued that it was considered but pressure to provide work for NRI from bilateral development funds led to these concerns being ignored.

Social and economic aspects

2.43 The pheromone projects generally had fairly narrow technically orientated objectives. Consideration of socio-economic issues was generally relatively weak. Even where it was not, the integration of socio-economic and technical inputs was often poor, as in the Pakistan case. Ultimate end-users were not significantly involved, and understanding of the factors affecting the adoption or otherwise of pheromone technologies remains poor. The evaluators concluded that this had affected the potential for implementation and impact and reduced the research effort's cost-effectiveness.

2.44 The WCH project also suffered to some extent from a lack of attention to economic aspects. The lack of detailed market research increased the risk of failure even when it was still expected that the machine would be manufactured and sold in Pakistan. Once the decision had been taken to involve a UK manufacturer, however, it became even less likely that Pakistan would provide a sufficiently profitable market for what was to be a much more expensive machine.

Environment and health impacts

2.45 The incidental inclusion of human health aspects in the DDTIA project objectives, and the very limited attention given to this issue during implementation, has proved to be a significant weakness and has undermined the project's main conclusion that DDT could continue to be used in certain circumstances. A separate assessment of the health impacts should be part of an environmental study of this type.

2.46 Despite the great importance of environmental and health aspects expected from pheromone projects, none included an explicit component of environmental or health assessment at any stage. Environmental benefits are likely to be the driving force in pheromone adoption. Thus, while the evaluators did not suggest that the absence of such assessments has reduced the immediate impact achieved, it has meant that the case for

pheromone research and use, and the need for strong environmental policies, has been understated among donors and recipient governments. The costs and long-term commitment required for this type of impact study suggest the need for evaluation planning at a research programme level.

Commercialisation

2.47 The evaluators concluded that inadequate consideration and management of the process of commercialisation was the main reason why the WCH project has been largely unsuccessful. Both Silsoe and engineering companies in Pakistan lacked the necessary commercial engineering skills, and attempts to interest UK manufacturers in developing the WCH for developing country markets were unsuccessful.

2.48 Commercialisation has generally been more successful for pheromones. NRI has conducted research in close collaboration with the commercial companies; has produced technologies for which profitable markets exist in DFID target countries; and has provided the companies with improved and faster market access. The contrast with the WCH experience is clear. In some cases, however, as with WCH, pheromone research continued despite the absence of a clearly perceived market for the product.

3

OTHER DFID EXPERIENCE

3.1 This chapter reviews other TDR evaluation material produced within ODA and DFID. Most of this relates to RNR research funded under the bilateral programme (paras 3.4-7). Very few other studies were commissioned by ODA or DFID which examine the development impact of research. Only four such studies were identified.⁴ These are summarised below (paras 3.12-20).

Bilateral RNR research experience

3.2 Central research expenditure managed by the professional divisions amounted to £ 57 million in 1995/96. NR research accounted for just over half of this (£ 31 million)⁵. Large investments in TDR are also made through the bilateral aid programme. PIMS data indicate that bilateral spending involving the TDR marker amounted to £ 88 million in 1995/96. Estimates vary, but RNR research accounts for approximately £ 50 million of this total (see Annex C). Bilateral RNR research expenditure is therefore on a par with central funded research.

3.3 Two types of bilateral document were collected : Project Completion Reports (PCRs) and project review documents.

Project Completion Reports (PCRs)

3.4 PCRs are required for geographical bilateral projects of a non-emergency nature with expenditure over £ 500,000. For projects below this threshold, or for non-geographical bilateral aid, PCRs are optional. Compliance is partial (but improving) and waivers are sometimes sought. PCRs therefore only exist for a proportion of bilateral research projects. 18 recent PCRs (1995 or later) were identified.

⁴Farrington et al (1993); Harrap et al (1994); Crapper and Neil (1997) and Flint and Mendelsohn (1995). A detailed evaluation by DFID of two projects funded by the Forestry Research Programme is under way.

⁵ Other DFID professional divisions (such as Education and HPD) have other programmes which fund research but which are not called research or TDR. The significance of NR research is thus overstated by the figures for research expenditure.

3.5 There are drawbacks in using PCRs as a source of evaluation material. For reasons outlined above, PCRs are not necessarily representative of the bilateral RNR research programme. PCRs are completed when it is too soon to forecast achievement, impact or sustainability with confidence. More importantly, PCRs are not independent or in-depth evaluations, but are completed by the programme manager concerned. An element of upward bias, and superficiality, in the performance ratings is therefore possible. These reservations need to be borne in mind when interpreting the findings summarised in Table 3 below.

TABLE 3: SUMMARY ACHIEVEMENTS OF BILATERAL RNR RESEARCH PROJECTS

| | | Achievement rating ⁶ | | | |
|-----------|--------------------------|---------------------------------|----------------------|------|-------------|
| Country | Project | Output | Purpose ⁷ | Goal | Sustainable |
| Africa | Locust grasshopper | 2 | 2 | X | ? |
| China | Forestry | 2 | 2 | X | ? |
| Eritrea | Animal disease | 3 | 3 | 4 | ? |
| Ghana | Larger grain borer | 1 / 2 | 2 | 3 | yes |
| Honduras | Forest genetics | 2 / 3 | 2 | 2 | |
| Kenya | Plant propagation | 2 | 2 | | yes |
| Kenya | NARP - rinderpest | 2 | 3 | 5 | yes |
| Kenya | NARP - socio-economics | 3 / 1 | 3 | 3 | yes |
| Kenya | NARP - crop protection | 2 | 2/3 | X | yes |
| Kenya | Tickborne disease | 3 | 4 | 4 | no |
| Nepal | Lumle agric. Centre | 2 | 2 | 3 | no |
| Nepal | Forestry research | 3 | 4 | 4 | no |
| Sri Lanka | Coconut processing | 2 | 3 | 3 | ? |
| Tanzania | Cashew research | 2 | 1 | 2 | yes |
| Tanzania | Zanzibar- clove research | 2 / 3 | 3 | | yes |
| Zambia | Tsetse control | 2 | 1 | X | ? |
| Zimbabwe | Forest research | 2 | 2 | X | ? |
| Zimbabwe | Save research station | 1 | 2 | 2 | yes |

⁶ see footnote 2 on page 12 for rating system

⁷ where two ratings are given, the first refers to the initial outputs, the second to the revised outputs.

3.6 Three features stand out from this table. First, most outputs are judged to have been largely achieved. Second, the sustainability of many projects is questionable. Third, the expected lower achievement at Purpose and Goal level than at Output level (para. 2.10) is not evident. In the opinion of the evaluator this does not represent a reliable picture, and is likely to be a function of the upward bias in reporting and of the fact that PCRs are completed too early for a reliable assessment of likely impact.

Lessons from the implementation phase

3.7 Whatever the accuracy of the ratings contained in the PCRs, they do contain useful lessons. These lessons are summarised below. The numbers in parenthesis refer to the frequency with which the lesson was mentioned. While the importance of ‘ownership’ is most frequently mentioned, it is noticeable that *institutional* lessons of one type or another are also very common.

- Fostering local ownership of the project - such as by having a pre-project preparation stage, by disbursing operating funds through the local system, or by a partnership approach to monitoring - pays dividends (5).
- logical frameworks need to be revised and kept up-to-date, fully shared with counterpart institutions, and used as monitoring tools (3).
- more and earlier socio-economic work, including market research, is often needed to understand the strategy and conditions required for uptake by farmers and pest control agencies (3).
- achievement of scientific outputs alone is insufficient. Unless development activities to ensure relevance, sustainability and applicability of the scientific work are also undertaken, uptake and impact may be poor (2).
- the exposure of developing country scientists to UK expertise and experience (eg. through institutional and professional links) is very beneficial (2).
- a detailed knowledge of the local institutional and policy environment is required as part of the project design process (2).
- project design needs to allow for the constraints that institutional development objectives impose on the achievement of other objectives (2).

- research institutions should not be developed beyond the means of the local system to absorb them, or maintained at unsustainable levels, unless DFID is committed to long-term funding (2).
- three-year projects may not be long enough. Ten year timescales would be more appropriate for many research projects.
- the assessment, during project design, of the resources available to recipient governments, and their ability to change their own institutional and management arrangements, must be realistic.
- close attention needs to be paid to institutional and management problems within organisations if the sustainability of institutional strengthening activities are not to be jeopardised.
- understanding of, and linkage to, other donor research programmes is important.
- UK scientists involved need to have a good understanding of development issues and institutional strengthening.
- funding local recurrent costs may be a necessary investment to achieve research outputs, even if it does not foster institutional sustainability.
- projects designed to develop commercial facilities should work with commercial end-users rather than with Government Boards.

3.8 These lessons, although often not new, are clearly still relevant and may not always be applied. They are more likely to be applied if they are disseminated within DFID and to consultants. At present lessons contained within PCRs are not formally disseminated in any way, except in a very abbreviated form as part of the annual PCR synthesis.

Other bilateral project review documents

3.9 An attempt was made to collect and synthesise the findings and lessons learned from recent Output-to-Purpose Reviews (OPRs) or comparable reviews. However, these are no longer copied to EvD on a routine basis, and there is no easy alternative source. Only three Mid-Term Reviews (MTRs) of RNR research projects, and one End-of-Project Review (EOPR), had been copied to EvD. All dated from 1995 and 1996 (see Annex B).

3.10 An assessment of these reviews revealed that they contained little of value for this synthesis. The MTRs were, almost by definition, too early in the project timescale to allow judgements to be made on the likelihood of achievement or impact, or for lessons

to be drawn. Only one MTR made any attempt at a systematic output-to-purpose review. The single EOPR made little reference to the Logical Framework and, while containing some useful additional lessons, was inferior to the PCR in terms of systematic analysis of the project. The need for a common and systematic structure and approach for OPRs and EOPRs is strongly indicated.

3.11 More recent and relevant OPRs for RNR TDR projects must exist. However, in view of the limited value of the four reviews received, it was concluded that further work on locating project reviews was not justified.

Other research reviews

3.12 As already mentioned, very few ODA or DFID studies were identified which have examined the uptake and impact of TDR projects, whether funded from central or country programmes. An ODA report in 1996 concluded that “there has been almost no systematic attempt to quantify the development impact of research projects” (Crapper and Hilton, 1996). This remains the case. Of the four studies identified, three cover the RNR sector and one relates to Economic and Social Research (ESCOR). No comparable studies were identified for engineering, health and population or education.

3.13 The first, and in many ways still the most useful and comprehensive, was a report on the **Factors Affecting the Uptake and Impact of RNR Research**, jointly commissioned by EvD and NRED (EV 580, Farrington and Edwards, 1993). A summary of these factors is contained in Table 4 below, together with an assessment of the extent to which similar factors applied in the case of the three projects evaluated.

Table 4 : Rating of factors favouring impact and uptake⁸

| Factor | DDTIA | WCH | Pheromones |
|--|----------------|-----|------------|
| Builds on earlier research | 3 | 1 | 1 |
| Multi-disciplinary preparation | 4 | 2 | 4 |
| Objectives and outputs clear | 2 | 5 | 3 |
| Close monitoring and evaluation | 2 | 3 | 3 |
| Adequate socio-economic inputs | 3 ⁹ | 4 | 4 |
| R&D conducted in developing countries | 1 | 3 | 1 |
| Effective dissemination | 4 | | 1 |
| Uptake pathway well defined | 4 | 4 | 3 |
| Intermediate users and needs well identified | 3 | 5 | 3 |
| Intermediate user participation | 1 | 5 | 2 |
| End-users and needs well identified | 5 | 5 | 5 |
| End-user participation | 5 | 5 | 5 |

3.14 These ratings were not estimated as part of the three evaluation studies, and are necessarily subjective. That said, the findings of the three evaluation studies appear to confirm the importance of these factors in explaining the extent of uptake and impact. The factors identified by EV 580 remain highly relevant to current research practice. Profitability and ease of use are, of course, critically important factors for the adoption of research products

3.15 The **Review of the Forestry Research Programme 1990-1993** (Harrap et al, 1994) included an assessment of the uptake of the programme and the likely impact on the ultimate beneficiaries. Eight centrally funded research projects were reviewed in detail. Most of these dated from the early 1990s.

⁸ 1 = completely applies 4 = only applies to a limited extent

2 = largely applies 5 = does not apply

3 = partially applies ? = uncertain

⁹ Two related economic studies were carried out, although not part of the project.

3.16 The study faced three major problems, all of which are relevant to research impact studies more generally. First, an objective assessment of uptake and impact requires projects which have been completed some years ago. Such projects are, however, likely to be less relevant to current research priorities. Second, impact assessment is time-consuming and therefore costly. Third, identifying the ultimate impact of research projects, particularly strategic research projects, is extremely difficult. While dissemination and uptake can be useful proxy indicators, they are necessary but not sufficient conditions for impact.

3.17 Two approaches were used to assess likely impact. The first considered whether the necessary factors favouring impact (as contained in Table 4 left) were present. The overall conclusion was that many of the crucial factors were missing.

3.18 The second approach considered whether the output-to-purpose assumptions were reasonable. It was concluded that some of the projects were based on untested and questionable assumptions, for example concerning end-user needs. The existence of adequate dissemination, adaptive research, extension, and marketing was more often assumed than assured. Doubts surrounding the assumptions meant that four of the eight projects were judged to have had low impact potential. The other four had medium impact potential.

3.19 The **Review of ODA's Experience of Bilateral Support to Forestry Research** involved a desk review of 10 projects implemented between 1990 and 1997 (Crapper and Neil, 1997). The main conclusions were that :

- the overall quality of bilateral research projects has been mixed, although several of the projects reviewed have produced highly relevant and useful results.
- objectives were poorly defined in most of the projects, and attention to project impact was limited.
- stakeholders and end-users were not identified and involved throughout the project cycle.
- project design was essentially supply-led, and followed a blueprint approach.
- most of the projects were, or should have been, primarily institutional development projects.

3.20 **The Economic and Social Research Programme (ESCOR)** commissioned a study of the influence of six research projects on development policy and practice (Flint and Mendelsohn, 1995). Once again, the identification and attribution of changes in policy and practice were found to be extremely difficult, as well as time-consuming. The study

indicated that research results were reaching developing country users in a very ad hoc way; supported the importance attached to improved dissemination; the need for dissemination to be properly resourced and integral to the research project; and the value of personal as well as paper dissemination. However, it also suggested that an emphasis on user-relevant research - and even user-led research - might be a more important factor in increasing research use than dissemination.

4

OTHER EVALUATION FINDINGS

4.1 In common with other EvD synthesis studies, this study intended to draw upon the findings and lessons of comparable evaluation studies commissioned by other donors. Contact was made with 15 bilateral and multilateral donors. A library search, and a search of the DAC evaluation database, was also carried out. However, almost no comparable evaluation studies were identified. The Department for International Development Cooperation in Finland has an ongoing evaluation of the effects and impacts of Finnish assistance to development research, but the main report has not yet been completed.

4.2 The recent NRRD impact monitoring study (Brown et al, 1997) found a similar picture. Most reports only assessed implementation and the delivery of research outputs. Due to the cost of producing statistically significant results, most organisations do not attempt to measure anything beyond adoption and its immediate effects. No evaluations of research projects were found which went as far as developmental impact.

4.3 Two research institutions have produced relevant material : the Australian Centre for International Agricultural Research (ACIAR) and the Consultative Group on International Agricultural Research (CGIAR).

ACIAR

4.4 ACIAR has a well staffed Economic Evaluation Unit which has produced over 25 working papers since 1995. Three economic impact assessments are of particular interest :

- Dryland farming in the semi-arid tropics of Kenya : ACIAR project experience.
- Estimates of benefits from three completed ACIAR forestry projects in Africa and Thailand.
- An economic evaluation of realised and potential impacts of 15 of ACIAR's biological control projects.

4.5 Three comments can be made on these studies. First, they demonstrate that economic assessments of RNR research are possible, provided the skills and resources are made available. Second, the studies confirm the potentially high rate of returns to research : 20%, 27% and 8 - 81% respectively. The latter range applies to 4 of the 10 completed biological control projects. A further 3 had unintended positive but unquantifiable economic benefits, and 3 had no impact (generally because the industry collapsed after the start of the project). Finally, these studies focus almost entirely on the narrow economic impacts. Assessments of other and wider developmental impacts (eg. poverty, institutions, or knowledge), or of research project management, are largely or completely absent.

CGIAR

4.6 The Impact Assessment and Evaluation Group (IAEG) of the CGIAR has recently commissioned a major methodological review and synthesis of existing ex post impact assessments produced by the International Agricultural Research Centres (IARCs). The first review of 87 CGIAR ex post impact assessments found that most have concentrated on applied research activities and on adoption and direct effects (such as increased yield). Basic research and intermediate or longer-term impacts (such as scientific, institutional, or economic impacts) have been given much less attention. Its main conclusions were that :

- if the goal of evaluation efforts of the IARCs is to provide a comprehensive picture of effectiveness, then systematically collected and reported information on intermediate products and indirect outcomes, not just on adoption and direct outcomes, is required.
- methods used in evaluations must be credible and clearly reported.

4.7 A second, more in-depth, review of 11 impact assessments divided IARC activities into two main types : (1) institutional research and support services, such as policy research and training; and (2) agricultural research and research support services. A hierarchy of outcomes was then defined for these two types of activity.

| INSTITUTIONAL SUPPORT SERVICES | | AGRICULTURAL RESEARCH AND RESEARCH SUPPORT SERVICES | | | BOTH TYPES |
|--|----------------------------------|---|------------------------------|----------------------|-------------------------|
| Uptake/ use by institutional clients | Institutional outcomes | Uptake/ use by institutional clients | Uptake/ use by beneficiaries | Beneficiary outcomes | Long-range outcomes |
| 1 | 2 | 3 | 4 | 5 | 6 |
| eg. changes in policies and procedures | eg. Institutional sustainability | eg. use of research products | eg. Adoption | eg. yield | eg. poverty alleviation |

4.8 The key findings for **institutional research and support services** were that:

- because of the complexity of the policy and planning arena, claims that findings have been adopted are generally more difficult to substantiate than claims of more tangible types of use (eg. citations).
- because it takes a complex set of factors to bring about institutional change, the ability of an IARC to affect the long-term viability of an institution or the reliability of agricultural services is limited. Even where IARCs have been successful in bringing about such changes, developing data that document this success is difficult.

4.9 Key findings for **agricultural research and research support services** are that :

- while the uptake and use of the products of IARC agricultural research by institutional clients is well-established, the use of products by beneficiaries is not well demonstrated.
- beneficiary outcomes (eg. yields) are little reported.
- information on long-range outcomes (eg. poverty or natural resources) is limited.

4.10 Further work assessing the adoption of CGIAR agricultural innovations is due to be completed this year. However, the overall conclusion of the IAEG study was that the

IARC documents are relatively uninformative about the types of users and about the short- and long-term effects on beneficiaries. In other words, “very little is known about the degree to which the CGIAR is achieving its mission of food security and sustainable agriculture in developing countries”. Much the same conclusion can be drawn about all DFID centrally-funded research programme. The ODA evaluations and reviews reported here are an insufficient basis for either accountability or lesson learning in either the central or bilaterally funded TDR programmes. The challenge of impact assessment is discussed in the next chapter.

5

DFID RESEARCH MANAGEMENT

5.1 The chapter considers the implications of the findings for current DFID research management procedures. A detailed review of these procedures, and more importantly the way they are applied in practice, was not part of this study. There are, however, some conclusions which are relevant to current debates, particularly on impact assessment.

Background

5.2 The main source of guidance for centrally funded RNR research is contained in the RNRRS Guidance Notes for Programme Managers (NRRD,1996). This refers to other sources of ODA guidance, such as sector strategies and manuals. Individual programme managers issue guidance to applicants and project managers. Office Instructions contain a section on centrally funded TDR, but this is of a general nature. There is no Technical Note on TDR.

5.3 Guidance for all bilateral projects is contained in Office Instructions. There is, however, nothing specific on bilateral TDR projects, nor is the section on centrally funded TDR relevant.

5.4 The management of all the centrally funded knowledge programmes was reviewed last year. The forthcoming establishment of a central knowledge unit will have implications for the monitoring, evaluation and dissemination of all sectoral research programmes, including RNR research.

Lessons learned

5.5 All three evaluation studies, and the few other reports reviewed, contain lessons for research management. The most important of these are repeated in the Summary below. However, most of the projects referred to were designed and implemented in the period

1985-1995. None was funded under the RNRRS. The key question for this study therefore is the extent to which the lessons are relevant to current research management, either within the RNRRS or bilateral programmes. Two specific questions need to be answered :

- do the research management guidelines take account of the lessons?
- does research management practice indicate that the lessons have been learned?

5.6 The general conclusion is that **RNRRS** research management guidelines (including proposal and appraisal procedures) now in place do incorporate most of the lessons contained in these evaluation studies and in the previous Uptake and Impact review (EV 580). The guidance may not , however, be as clear as it needs to be. This can only be ascertained by reviews of how well these guidelines are applied in practice (see para. 5.9). Subject to this, there may be a case for expanding and clarifying management guidance in a separate ‘best practice’ note on research project design, appraisal and implementation. This would incorporate lessons learned from evaluation studies, bilateral PCRs and OPRs, and could be periodically updated. EV 580 is the only document which approaches this at present.

5.7 A best practice guidance note would also go a long way to filling the gap in specific guidance for bilateral TDR projects. Whether there should be a common Technical Note for all TDR programmes (central and bilateral), or a separate guidance note for RNR research, would need to be discussed with the new DFID knowledge unit.

5.8 Lessons that have not yet been adequately catered for in the RNRRS procedures include those relating to commercialisation, policy research, and institutional issues. The WCH experience has particular implications for DFID policy on intellectual property rights. A review and/or expansion of the RNRRS guidance on these issues, either within the existing guidelines or as part of a best practice note, could be considered.

5.9 The second question - research management in practice - cannot be answered by this study. There are no studies (past or planned) which address the effectiveness of the RNRRS guidelines in practice, or the extent to which bilateral research is applying the guidelines. There are indications that the RNRRS procedures may not be universally and uniformly effective at addressing the issues. The extent to which research procedures are applied in practice, and the adequacy of the procedures even when fully applied, should be systematically reviewed within the RNRRS, possibly as part of the proposed programme OPRs (para. 5.16). This compliance and quality control exercise would inform the content of the best practice guidance referred to above.

Impact assessment

5.10 Assessing the likely and actual impact of DFID-funded research remains the great challenge. Being able to monitor progress towards objectives is an essential part of research project and programme management. Being able to assess and demonstrate impact is an essential part of making the case for further research funding.

5.11 The case for TDR within DFID still rests to a large extent on two arguments : that there is a general case for investing in knowledge, and that it is possible to identify examples of projects which have had impact. The general case is persuasive and is not contested. The second argument is far weaker.

5.12 Examples of research impact have been listed in a number of documents (Crappier and Hilton,1996), including most recently the White Paper on International Development. The implicit argument is either that these examples are representative of the whole or, more plausibly, that the magnitude of impact achieved in a few projects is more than sufficient to justify the cost of the research programme as a whole. The case of pheromones research in Egypt is a case in point : this has saved the Egyptian government more in terms of reduced pest control costs than the cost of the whole pheromone programme over fifteen years. Research is by definition a high-risk, but potentially high-benefit, activity. It is therefore only to be expected that many projects will not 'succeed' in terms of producing developmental impact. The few that do, however, may have enormous impact. This reinforces the case for assessing the value of research at the programme level, albeit through a detailed evaluation of a representative sample of projects.

5.13 The problem with this argument is that it remains untested and unproven. Most importantly, a reliance on anecdotal examples of research impact is unnecessary. There is no good reason why a more systematic approach to impact assessment and research evaluation cannot be introduced.

5.14 Experience within DFID - as reported in Chapter 4 - and elsewhere suggests that the monitoring and evaluation of research presents a particular challenge. Assessing the developmental impact of research is difficult and expensive. This does not mean, however, that it should not be attempted. Rather, it indicates the need for a planned approach (so that the necessary baseline and monitoring information is available for a sample of projects); for a systematic and strategic approach for both central and bilateral programmes; and for central evaluation coordination and support across all DFID TDR programmes.

5.15 The approach to impact assessment would, of course, need to recognise that there are different types and levels of impact, and that some are easier to measure reliably than are others¹⁰. The distance in time and space between the knowledge produced by research, and impact on the livelihoods of poor people, may be large. Measuring and attributing impact on the latter may be impossible. Attention to measuring the intermediate levels of impact (such as uptake by institutional users) may be the more productive and realistic option.

5.16 Procedures for monitoring the impact of the **RNRRS** have recently been reviewed (Brown et al, 1997). The recommendations of this review are currently being implemented. These include the requirement that the individual research programmes develop Impact Monitoring Plans (IMPs), and for NRRD to plan a programme of OPRs. The case for triennial rather than quinquennial programme reviews is strong. Compared to bilateral programmes of comparable financial size, RNRRS programmes are more intensively managed but have a low frequency of in-depth reviews (such as OPRs). The latter may be more important given the long- term nature of research.

5.17 These innovations should greatly improve impact assessment within the RNRRS and in other sectoral TDR. Nevertheless, the lessons of previous impact assessment exercises; the time, skills and resources required for reliable results; and the need for a more systematic approach; suggest that the proposed approach does not go far enough, and is too reliant on individual programme managers. There is a strong case for a more planned and strategic approach to research evaluation within the RNRRS, as for the other sectoral TDR programmes. Such an approach would best be co-ordinated by the new central knowledge unit, and supported by Evaluation Department.

5.18 Achieving a similar improvement in the evaluation of *bilateral* country RNR research will be more difficult. Very little is known about the performance or impact of this expenditure at present, and any lessons learned within individual projects or country programmes are not disseminated to DFID staff or consultants elsewhere (para. 3.8). The production of monitoring and evaluation guidelines once experience has been gained within the central programmes would help. However, the management of bilateral country research projects remains less intense than within the RNRRS. In the absence of an initiative from the centre, it is therefore likely that evaluation of bilateral research will remain ad hoc and may be unsatisfactory. Many potentially important and useful lessons will not be generated and disseminated within DFID as a result. Once again, this points to a need for a strategic, planned, and centrally supported and co-ordinated approach to bilateral research evaluation.

¹⁰ The DFID Draft Glossary of Aid Terms defines IMPACT as 'changes attributable to the project'. Impacts can be short-term or long-term; positive or negative; planned or unplanned; technical, institutional, economic, social and cultural, and environmental; and are likely to be experienced differently by different groups.

SYNTHESIS OF EVALUATIONS OF THREE TECHNOLOGY DEVELOPMENT AND RESEARCH (TDR) PROJECTS/PROGRAMMES IN THE RENEWABLE NATURAL RESOURCES (RNR) SECTOR

AIMS

The aims of the study are:

- to disseminate within DFID and elsewhere the findings and lessons learned primarily from three evaluations of RNR research projects;
- thereby to help enhance the effectiveness of DFID's support for technology development and research (TDR) in bilateral country programmes and the centrally-funded programmes.

SCOPE OF WORK

The synthesis will focus on the findings and lessons learned from three ex post evaluations of DFID RNR research projects.

The following specific tasks will be undertaken :

- review and synthesise the findings, lessons learned and recommendations arising from the evaluations - Whole Crop Harvester, Pheromones and DDT Impact - and any recent OPRs (or comparable reviews) and PCRs for DFID TDR projects;
- review the findings, lessons learned and recommendations emanating from other major comparable evaluations of donor-funded TDR projects;
- compare the findings of the above reviews with those of EvD report EV 580 'Review of the Factors Influencing the Uptake and Impact of ODA-supported Renewable Natural Resources Research' also taking into account DFID's current approach to centrally-funded RNR research as set out in the Renewable Natural Resources Research Strategy, 1995 - 2005 (report of Research Task Group, May 1994) and of 'Monitoring the Impact of the DFID Renewable Natural Resources Research Strategy, 1995 - 2005 (ITAD and others, September 1997).
- draw out, and assess the implications of, the key findings, lessons and recommendations for the management of DFID TDR projects.

The synthesis of the above materials should where possible include consideration of the following:

- the benefits accruing from support for the evaluated activities and their overall impact;
- the comparative merits of different modalities of operation;
- the optimum duration of project inputs;
- project monitoring and performance indicators;
- relevant cross-cutting issues including poverty, gender, environmental impact, institutional strengthening and any others identified from the documentation review;
- current DFID policy relating to the sector.

REPORTING

A draft report of up to 20 pages in length shall be prepared, summarising the findings of the synthesis for subsequent submission to the PEC. The report will be revised as necessary, following receipt of comments, and a final document produced for release into the public domain and circulation to all DFID staff with an interest in TDR issues. The work shall be carried out in accordance with the booklet 'ODA Evaluation Studies: Guidelines for Evaluators'.

INPUTS

The time allowed for the study including documentation review and report writing shall be three weeks.

DOCUMENTS CONSULTED

ANNEX B

Brown, D. et al (1997) - Monitoring the impact of the DFID Renewable Natural Resources Research Strategy for 1995-2005. Report to the Research Strategy Monitoring Panel.

CGIAR (1997) - Methodological Review and Synthesis of Existing Ex Post Impact Assessments. Reports 1 and 2. CGIAR Impact Assessment and Evaluation Group.

Crapper, D. and Hilton, P. (1996) - The contribution of ODA Technology Development and Research to the advancement of ODA aims.

Croxton, S. et al (1997) - From Aid funded research to commercialisation : the case of the Whole Crop Harvester (EV 590)

DFID (1997) - Review of Advisory Divisions Knowledge Programmes

Farrington, J. et al (1993) - Review of factors influencing the uptake and impact of ODA-supported renewable natural resources research (EV 580)

Flint, M. and Harrison, M. (1997) - DDT Impact Assessment Project, Zimbabwe (EV 602)

Harrap, K. et al (1994) - Review of ODA Forestry Research Programme 1990-93

Mosselmans, M. (1997) - Review of the Management of Knowledge Programmes

Mumford, J. et al (1997) - Pheromones (EV 578)

Uski, P. (1997) - Finnish Assistance to Development Research. Draft.

Crapper D and Neil P (1997) - A review of ODA's experience of Bilateral Support to Forestry Research.

Flint M and Mendelsohn G (1995) - A study of the influence of Six Research Projects on Development Policy and Practice (unpublished).

BILATERAL RNR RESEARCH : REPORTS CONSULTED**ANNEX C**

| | | |
|-----------|--------------------------------------|------|
| Africa | Locust grasshopper | PCR |
| Brazil | Central Amazonia Flora | MTR |
| China | Forestry programme | PCR |
| Eritrea | Animal disease investigation | PCR |
| Ghana | Larger grain borer control | PCR |
| Honduras | Forest Genetic Project | PCR |
| Kenya | NARP 1 Crop Protection Project | PCR |
| Kenya | NARP- improved control of rinderpest | PCR |
| Kenya | NARP socio-economics project | PCR |
| Kenya | Plant conservation and propagation | PCR |
| Kenya | NARP Phase II | MTR |
| Kenya | Tick-borne diseases | PCR |
| Namibia | Kavango FSR extension & training | MTR |
| Nepal | Forestry Research Project II | PCR |
| Nepal | Lumle agricultural centre | PCR |
| Sri Lanka | Improved coconut processing | PCR |
| Tanzania | Cashew research project | PCR |
| Tanzania | Cashew research project | EOPR |
| Tanzania | Zanzibar clove research | PCR |
| Tanzania | Armyworm control project III | PCR |
| Zambia | Adaptive research - tsetse control | PCR |
| Zimbabwe | Insect pest management - tsetse | AR |
| Zimbabwe | Save experimental station | PCR |
| Zimbabwe | Forest research & institution | PCR |

ANNEX D

DFID Central Research Expenditure (£'000)

| Sector | 1991/2 | 1992/3 | 1993/4 | 1994/5 | 1995/6 | % Increase 91/2-95/6 |
|-------------------------------|---------------|---------------|---------------|---------------|---------------|-----------------------------|
| NR [NRRD,NRPAD,EPD] | 29,378 | 33,671 | 32,797 | 34,056 | 31,329 | 6.6% |
| ENGINEERING | 8,523 | 9,671 | 11,194 | 10,535 | 10,546 | 23.7% |
| HEALTH AND POP | 6,045 | 8,723 | 9,128 | 9,615 | 9,296 | 53.8% |
| EC & SOC & IDS | 4,076 | 4,119 | 4,218 | 4,544 | 5,400 | 32.5% |
| EDUCATION | 147 | 290 | 367 | 216 | 280 | 90.4% |
| TOTAL | 48,169 | 56,474 | 57,704 | 58,966 | 56,851 | 18.0% |

Bilateral TDR Expenditure - All sectors and RNR (PIMS data) (£ million)

| | 1994/95 | | | 1995/96 | | | 1996/97 | | |
|-------------------------------|----------------|-------------|-------------|----------------|-------------|-------------|----------------|-------------|-------------|
| | Principal | Significant | TOTAL | Principal | Significant | TOTAL | Principal | Significant | TOTAL |
| ALL SECTORS | 53.6 | 27.8 | 81.4 | 55.9 | 32.3 | 88.2 | 53.8 | 29.1 | 82.9 |
| RNR marked for:- | | | | | | | | | |
| TDR & FORESTRY | 9.0 | 5.4 | 14.5 | 10.5 | 7.2 | 17.7 | 8.1 | 8.6 | 16.7 |
| TDR & BIODIVERSITY | 4.3 | 1.2 | 5.5 | 6.3 | 2.5 | 8.9 | 5.2 | 4.4 | 9.6 |
| TDR & SUSTAINABLE AGRICULTURE | 17.0 | 9.2 | 26.2 | 20.9 | 12.1 | 33.0 | 18.9 | 11.7 | 30.6 |

Bilateral TDR RNR Expenditure (NARSIS data) (£ million)

| | 93/94 | 94/95 | 95/96 | 96/97 |
|-----|--------------|--------------|--------------|--------------|
| RNR | 43.6 | 45.3 | 51.9 | 36.9 |

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