



# Learning from the Renewable Natural Resources Research Strategy

## Pathways for change: monitoring and evaluation

*Monitoring and evaluation (M&E) plays a central role in ensuring accountability, informing decision-making and, more broadly, facilitating learning. The programmes within the DFID-funded Renewable Natural Resources Research Strategy (RNRRS) have developed some innovative methods of M&E. The RNRRS also saw an evolution in thinking in M&E, moving from a focus on the M&E of research products to a recognition that the context and mechanisms for adoption of research products are equally important, as is the effect on poverty reduction.*

### Key messages

- The degree of innovation of M&E methodologies varied among the different projects and programmes. Most new knowledge was generated in the area of developmental outcomes.
- There is increasing interest in moving beyond a focus on the elements of analysis of M&E derived from the logical framework (inputs, activities, outputs and outcomes) to one of understanding the processes or pathways affecting the uptake of research products.
- Processes or pathways may facilitate or hinder the adoption of research technologies and outputs and their eventual impact on people's livelihoods. Pathway analysis places research within broader social and political contexts.
- Knowledge of the context for implementation and/or dissemination of a research product is also gaining impetus. The 'national systems of innovation' approach offers a conceptual framework for understanding the institutional context of agricultural technology and processes and the associated web of actors, relationships and activities.
- While reporting for accountability purposes will continue to be important, there is a growing need to encourage learning processes within future research projects, coalitions and networks. Organisational learning provides a welcome addition to M&E thinking with a focus on individual and collective reflection and learning.

### Introduction

The new DFID Strategy for Research on Sustainable Agriculture (2006–2016) has a regional focus with decentralisation of decision making, management and administration to developing countries. The Strategy encourages innovation, exploring scientific potential and the scaling-up of successful innovations and best practices. There are significant implications for institutional relationships within the

new strategy, implying less clearly defined projects and more coalitions or networks based around developmental problems.

While reporting for accountability purposes will continue to play an important role, there will be an increased need to encourage learning processes within and between those involved in research coalitions and networks. The RNRRS has seen progress in thinking about the implications of

institutional learning, and this Brief helps to share valuable lessons regarding M&E, which could be built into future frameworks and systems.

The Brief looks at the RNRRS system and highlights some innovative methods that have been developed for monitoring research outputs and outcomes and for assessing uptake and impact processes, innovation systems and organisational learning. It concludes by sharing relevant lessons for future natural resource research strategies. The Brief provides a synthesis of new knowledge rather than a comprehensive review of current information.

### M&E systems in the RNRRS

M&E activities took place throughout the 1600 projects of the RNRRS during its 11-year life. RNRRS guidelines for M&E projects and programmes were based largely around the various elements of the logframe, namely the M&E of project inputs and activities, outputs, outcomes and impacts. According to the RNRRS guidelines (DFID, 2000), the M&E of project activities, outputs and outcomes was the responsibility of programme managers. Impact assessment of the overall strategy was the responsibility of DFID, and falls outside of

the scope of this study. Table 1 describes the levels of M&E used within RNRRS projects from a project logframe.

### Innovation in M&E methodology

Innovative M&E methods are defined here as those that are entirely new or applied to a new development or research context. The study found that there was relatively little innovative M&E at the inputs and activities level, since projects generally adhered rigorously to standard reporting formats.

At the output level, in many cases new technologies were developed and/or field-tested in collaboration with beneficiaries, and hence outputs were interpreted not only as the documentation of those new technologies, but the application of those technologies in the field. Therefore, in addition to routine monitoring (assessment of written outputs), some projects aimed to monitor the success of new technologies, evaluate their potential for uptake, and identify any potential challenges during the research process. For example, the Plant Sciences Programme (PSP) used farm-level participatory M&E, such as participatory plant breeding and participatory varietal selection (see project R7542 for example).

**Table 1. Levels of M&E used within RNRRS projects**

Level	Description	Reporting requirement/how measured
Inputs and activities	Assessment of progress in implementation against timescales and resource use against budgets	Reporting on progress of implementation and spend on a quarterly and annual basis
Outputs	Assessment of the products of agricultural and natural resources research	Reporting of quantity and quality of written outputs. Quality assessed by peer-reviewed journal outputs. Broadened at a later stage of RNRRS to include workshops, wider sets of journals
Outcomes	Assessment of how the outputs of research achieve some direct effect	Measurement of the uptake of new technologies, change in agricultural or resource management practice or influence on institutional or policy processes

Through direct observation, formal methods such as questionnaires, and informal or participatory approaches, farmers evaluated useful traits from new varieties.

More innovative practice was apparent in the M&E of developmental outcomes, particularly in the use of participatory techniques or adaptation to different contexts or sectors. These included use of ‘most significant change’ (MSC) stories, participatory budgets and livelihood asset indicators.

### Stories of change

MSC is a participatory monitoring technique based on stories rather than indicators of change resulting from project activities or outputs. MSC stories give a rich picture of the impact of development work and provide a basis for dialogue on key objectives and values of development programmes. MSC comes into its own where outcomes are unexpected or meanings are disputed, a situation that conventional indicator methods are unlikely to identify. It also allows for broad participation and sets experiences and outcomes in context. MSC was used by the Natural Resources Systems Programme project Promoting the Pro-Poor Policy Lessons of an Earlier Aquaculture Service Provision (R8334/R8100), managed by Support to Regional Aquatic Resources Management (STREAM).

Case studies or stories of change have been used elsewhere in RNRRS projects as a more informal tool for demonstrating outcomes, such as annual reports and publicity materials. There are challenges to using stories as a formal methodology for M&E (e.g. bias towards success stories and subjectivity in the selection process) and the literature on MSC has gone some way to explore this. Davies and Dart (2005) is a useful source of reference.

### Participatory budgets

These were used to assess outcomes in the Crop Protection Programme (CPP) project Improving Production in the Teso Farming System through the Development of Sustainable Draught Animal Technologies (R7401), which was designed to investigate ways of alleviating labour constraints associated with weeding annual crops in the Teso farming system of Uganda. The project conducted

a baseline survey using beneficiary impact assessments, followed by a participatory assessment of the different weeding technologies using participatory budget methods to compare use and non-use of the technology in annual crops. This gauged the social and economic impact and sustainability of the technologies on the beneficiary populations and assessed the future potential demand. The participatory budgets were developed with groups of farmers through semi-structured interviews that explored general impacts on lives and livelihoods, and how household budgets had changed (Aliguma, 2004).

### Livelihood asset indicators

The Livestock Production Programme (LPP) project Understanding Small Stock as Livelihood Assets: Indicators for Facilitating Technology Development and Dissemination (R7823) explored livestock as a livelihood asset in Bolivia and investigated the development of livelihood asset indicators to show the changing contribution of keeping livestock. The project team developed a set of methods based on an understanding of livelihood assets and their functions. These were based on the recognition that assets have diverse functions; for example, livestock may be used for food, saving money or insurance. Furthermore, each asset has attributes that make it effective in fulfilling a particular function. The functions – and the efficiency with which the assets and activities fulfil them – vary in importance over time and according to people’s individual circumstances, which are shaped by market and other external opportunities and constraints (Dorward et al., 2005).

### Frameworks for planning and organising M&E

A comprehensive framework for M&E focuses attention on information collection needs and learning at different stages of the project cycle and for different ends. Few projects documented M&E systems which covered more than one single aspect of M&E. Notable examples of more comprehensive attention to an M&E system are STREAM, the Crop Post Harvest Programme (CPHP) East Africa and the balanced scorecard approach explored by the Forestry Research Programme (FRP) (see Additional resources).

## The missing link – the M&E of processes

Recent literature shows that focusing purely on logframe elements (inputs and activities, outputs, outcomes and impacts) fails to capture the complexity of the intervening processes. The relationships between the logframe elements depend on the processes or pathways that facilitate the uptake, adoption and adaptation of research products (see Figure 1). Pathway analysis places research within the broader social and political contexts and attempts to construct possible sequences of events that will lead from one stage (such as outputs) to another (such as outcomes).

The generic logical framework sequence therefore serves as a starting point for pathway analysis, but the focus is on mapping and monitoring the process of moving from one stage to another. Pathway analysis explores the causal links along a chain from activity to impact. Analysis may take place at different stages of a pathway, when it may be known as uptake mapping, outcome mapping, critical path analysis, etc. Most approaches involve developing a visual representation that divides the various segments of the pathway into smaller sequences of events and intermediary steps. Such methods were used within the RNRRS, as the examples below illustrate.

### Uptake mapping methods

These were developed for monitoring technology adoption and spread at the village level in the CPHP project R6639, which aimed to develop improved cassava processing methods (Kajimbwa et al., 1998). The approach involved developing local indicators, such as technology borrowing and technology fabrication, recorded using symbols on a ‘social map’. The experiences with participatory M&E further strengthened researcher–farmer linkages and the

capacity of extension staff to develop and apply a new technology and analyse its impact.

Uptake mapping, and other similar methods used in the RNRRS, is reflective, aiming to draw lessons from adoption processes that had already occurred. Ideally the pathway is constructed at the project planning stage to establish the necessary factors and assumptions relating to how research uptake and/or impacts will be achieved.

The FRP project Malawi Miombo Forest Management (R6709/R7925) attempted to predict uptake pathways by using a Bayesian belief network (BBN) software approach. This is essentially a causal flow diagram that plots possible outcomes through a series of nodes representing events or critical success factors. The nodes are connected by links and these show the relationships of influence or dependency between them. The BBN approach addresses risk and the implications of variance from plan, something that other simpler pathway models do not capture (Marsland et al., no date).

## Understanding the institutional context

It is increasingly recognised that an understanding of the context in which research is implemented or disseminated is important in order to ensure an appropriate environment for successful uptake of a research product. It is acknowledged that greater impact from research implies stronger interaction and exchange between the many actors and institutions involved in the development and promotion of innovations (Rath and Barnett, 2005).

Over the past nine years the CPHP evolved into what it described as a ‘new research paradigm, which emphasises the importance of understanding and working with national institutional systems in order to convert research into successful innovation’ (CPHP

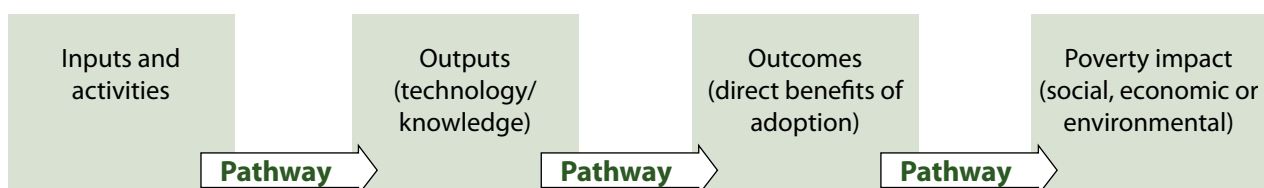


Figure 1. The logical framework sequence including pathways between different levels

website, [www.cphp.uk.com](http://www.cphp.uk.com)). The CPHP's approach is in line with the national systems of innovation (NSI) concept, which proposes that innovations emerge from systems of actors. These systems are embedded in the social, political and institutional contexts that determine how individual actors behave and how they interact with other elements of the system. Institutional context and relationships among actors are key components of such systems. Understanding and monitoring them can be critical to the success of research undertakings.

The participatory M&E procedures developed by CPHP in East Africa (DFID CPHP, 2005) offer guidance on how to monitor changes in a project's institutional context and the partnerships and relationships between key organisations and individuals involved. It emphasises the importance of establishing a baseline study. This should highlight the organisations that will be involved in the project, their relationships to one another, and the context within which they operate, including incentives and disincentives, norms of interaction and market factors. Hypotheses and assumptions about the institutional environment required for effective production and uptake of outputs should be carefully examined at this stage since this will allow identification of aspects that need to be monitored.

Tools including reflection and lesson-learning workshops and the construction of institutional histories are proposed for monitoring relationships and context. Reflection and lesson-learning workshops involve reporting on actions taken during a period. They also include critical analysis of project experiences and questioning of assumptions around key themes, namely partnerships, institutional arrangements within the coalition, institutional arrangements with external organisations, and the processes through which learning occurs. Institutional histories construct a time line, gain a clear understanding of roles and relationships, enquire into what triggers successful innovation, and reflect on any failures. They are used to reflect on the evolution of processes and institutional arrangements in a project, allowing investigators to draw lessons and improve performance.

Other relevant tools used in RNRRS projects include actor linkage maps and actor linkage matrices (Biggs and Matsuert, 2004).

## Organisational and institutional learning

Organisational or institutional learning is about creating a context in which reflective learning can take place. This will help actors to question and understand processes, to learn lessons from practice, and to apply what is learned to change behaviour and improve performance. It is less about developing methods and procedures, but more about creating a context and environment in which the results of M&E contribute genuinely to reflective learning and critical self-awareness among professionals, leading to action for change.

CPHP work on NSI explored how to move towards an organisational learning approach and the kinds of arrangements necessary to support learning and institutional change among groups of stakeholders. This change requires appropriate staff skills and attitudes, as well as a supportive organisational culture with top-level legitimisation, permitting experimentation and potential failure.

## Lessons for sustainable agriculture strategies

The study distilled general lessons relating to how M&E was conceptualised and developed, and provides recommendations for future research strategies.

### Develop an M&E and impact assessment strategy from the outset

An M&E framework should be developed from the outset of a new research strategy. It should outline objectives, expectations and different levels of M&E or impact assessment at different stages, clarifying roles and responsibilities and identifying how the systems contribute to long-term impact assessment. Baseline data and common indicators should also be established, while the institutions involved should decide on appropriate methods for data collection.

### Use existing methods and tools

A wide range of methods and tools have been developed within the RNRRS programmes and beyond. Participatory approaches and the sustainable livelihoods framework offer particularly successful directions for future innovation. A systematic



review of existing methods would be valuable as a practical resource for those developing an M&E strategy.

### **Include pathway analysis**

Pathway analysis should be used more systematically to predict uptake, outcomes and impacts of research outputs and technologies within the new strategy. Pathways should be monitored and challenged on an ongoing basis to maximise the lesson-learning process. This includes examining internal and external influences, including unanticipated changes.

### **Enhance harmonisation of M&E with other donors**

Projects with multiple sources of funding often have numerous reporting requirements. Taking steps to match reporting demands across institutions will enhance efficiency, particularly in the context of more collaborative research systems.

### **Allocate sufficient resources**

Allocation of sufficient staff and financial resources is vital for developing effective M&E systems. A lack of resources for this important aspect of programme and project management is likely to reduce internal learning and result in poor performance.

### **Foster organisational incentives and a culture of learning**

It is important to encourage learning across programmes and institutions, and to seek areas for potential collaboration. Institutional incentives and individual capacity are needed to ensure effective learning. The development of a genuine organisational culture of learning and reflection is challenging, but critical.

### **Additional resources**

Aliguma, L. (2004). Impact assessment of weeder technologies in the Teso farming system. NARO:Uganda.  
Biggs, S. and Matsuert, H. (2004). Social science tools for use in promoting poverty reduction in natural resources innovation systems. In: Hall, A.J., Yoganand, B., Sulaiman, R.V. and Clark, N.G. (eds). Post-harvest innovations in innovation. Department for International Development/

Crop Post Harvest Programme: Adhra Pradesh, India and Natural Resources International, Aylesford, UK.

Davies, R. and Dart, J. (2005). The 'Most Significant Change' (MSC) technique: A guide to its use. Mimeo. Available online at: <http://www.mande.co.uk/docs/MSCGuide.htm>

DFID CPHP East Africa (2005). User manual: Participatory monitoring and evaluation for coalition projects. Department for International Development: London, UK.

DFID (2000). Renewable Natural Resources Research Strategy guidance notes for programme managers. Department for International Development: London, UK.

Dorward, A., Anderson, S., Nava, Y., Pattison, J., Paz, R., Rushton, J. and Sanchez V.E. (2005). A guide to indicators and methods for assessing the contribution of livestock keeping to the livelihoods of the poor. Imperial College: London, UK.

Hainsworth, S.D. and Eden-Green, S.J. (eds) (2000). Sustaining change: Proceedings of a workshop on the factors affecting uptake and adoption of Department for International Development Crop Protection Programme research outputs. Natural Resources International: Aylesford, UK.

Henderson, J.S. and Burn, R.W. (2004). Uptake pathways: The potential of Bayesian belief networks to assist the management, monitoring and evaluation of development-orientated research. *Agricultural Systems* 79: 3–15.

Kajimbwa, M., Bockett, G., Goodland, A. and Mlingi N. (1998). Methodological issues and challenges to establish village-based participatory monitoring and evaluation. Paper presented at the Global Symposium on Farming Systems Approaches December 1998, South Africa.

Marsland, N, Henderson, S. and Burn, B. (no date). On-going evaluation of FRP Project 'Sustainable management of miombo woodland project by local communities in Malawi' Case Study 4. Natural Resources Institute and University of Reading: UK. [http://www.rdg.ac.uk/ssc/publications/guides/cs4\\_miom.pdf](http://www.rdg.ac.uk/ssc/publications/guides/cs4_miom.pdf)

Rath, A. and Barnett, A. (2005). Innovation systems: Concepts, approaches and lessons from the RNRRS. RNRRS Synthesis Study No. 10. The Policy Practice Limited: Brighton, UK.

### RNRRS projects

- R6639 Improved Cassava Utilisation in Tanzania
  - R6709/R7925 Sustainable Management of Miombo Woodland by Local Communities in Malawi
  - R7401 Improving Production in the Teso Farming System Through the Development of Sustainable Draught Animal Technologies
  - R 7542 Participatory Crop Improvement (PCI) in High Potential Production System (HPPS) – Piloting Sustainable Adoption of New Technologies
  - R7823 Understanding Small Stock as Livelihood Assets: Indicators for Facilitating Technology Development and Dissemination
  - R8334/8100 Promoting the Pro-poor Policy Lessons of an Earlier Aquaculture Service Provision Project Managed by Support to Regional Aquatic Resources Management
- For further information see <http://www.research4development.info/projectsandprogrammes.asp>

### About this Brief

This Brief is an edited summary, prepared by Susanne Turrall, of a paper written by Kath Pasteur and Susanne Turrall (2006): *A synthesis of monitoring and evaluation experience in the Renewable Natural Resources Research Strategy*. [www.research4development.info/thematicSummaries/RNRRS\\_ME\\_synthesis\\_FINAL.pdf](http://www.research4development.info/thematicSummaries/RNRRS_ME_synthesis_FINAL.pdf)

### Other RNRRS Briefs

- Participatory research approaches
- An integrated approach to capacity development
- Research, policy and practice in water management
- Effective policy advocacy
- From research to innovation systems
- Gender: some insights
- Poverty measurement, mapping and analysis

#### About the Renewable Natural Resources Research Strategy (1995–2006)

The objective of DFID's Renewable Natural Resources Research Strategy (RNRRS) was to generate new knowledge and to promote its uptake and application such that the livelihoods of poor people are improved through better management of renewable natural resources. Through its ten research programmes it addressed the knowledge needs of poor people whose livelihoods are dependent on natural resources production systems in semi-arid areas, high potential areas, hillsides, tropical moist forests, and at the forest/agriculture interface, the land/water interface and the peri-urban interface. The breadth of the strategy programme reflected the wide variety of environments in which poor people live in poorer countries and the multiple routes by which research can reduce poverty.

For more information about the source papers and other RNRRS thematic summaries, visit <http://www.research4development.info/thematicSummaries.asp>

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