Unit Ten: Monitoring and Evaluation

UNIT INFORMATION

Unit Overview

This unit explains the nature and purposes of project monitoring and evaluation (M&E), and the differences between these two complementary but distinct activities. It discusses what can go wrong with project M&E systems and sets out a framework of concepts and principles that can aid the design and implementation of effective project M&E. In doing so it provides the core of a 'guidance manual' or 'handbook' for professional work in this field. How to plan and implement a project M&E system is explained in some detail through a review of the main steps and approaches required. The role of participation in M&E design and implementation is considered, and the unit concludes with a discussion of how to create a learning environment for project managers and for project implementation.

Unit Aims

- To explain the principles, objectives and processes of project monitoring and evaluation.

- To provide guidelines on the principal requirements of a successful project monitoring and evaluation system.

- To present approaches to project monitoring and evaluation using the Logframe.

- To highlight results-based monitoring and evaluation and the key steps for implementation.

- To set out the key principles for developing indicators.

- To provide sufficient understanding of the role of monitoring and evaluation in rural development, to be able to judge the effectiveness of existing project M&E systems, and the appropriateness of proposed project M&E designs.

Unit Learning Outcomes

By the end of this unit, students should be able to:

- understand conceptual frameworks, principles, and guidelines necessary for the effective design and operation of project monitoring and evaluation systems

- understand what elements are essential to successful M&E, and what must be avoided

KEY READINGS

❖ IFAD (2002) *Managing for Impact in Rural Development: A Guide for Project M&E*. International Fund for Agricultural Development (IFAD), Rome, pp. 1–32.

Available from: http://www.ifad.org/evaluation/guide/index.htm

This extract from a very useful and practical guide to M&E provides an overview of key concepts and a guide to managing for impact using an adaptive management and learning approach. It is more project focused than some recent guidelines for M&E which focus on sectoral management in the public sector. It is thus more closely oriented to the needs of project managers in the field.

❖ Rogers P (2009) Matching impact evaluation design to the nature of the intervention and the purpose of the evaluation In: Chambers R, Karlan D, Ravallion M, Rogers P (2009) *Designing Impact Evaluations: Different Perspectives.* Working Paper 4 of the International Initiative for Impact Evaluation (3ie), New Delhi, pp. 24–31.

Available from: http://www.3ieimpact.org/en/evaluation/working-papers/working-paper-4/

This reading is the concluding part of a paper that considers how best to evaluate the impact of three different development interventions. (The complete paper is listed in the Further Readings section). The reading highlights the importance of selecting appropriate methods in the design of impact evaluation. It argues that no single method for evaluating impact (whether randomized control trials, participatory approaches, or some other method) will be appropriate in all circumstances. Which method, or combination of methods, will be most suitable will depend upon the answer to two important questions: 'What is the nature of the intervention?' and 'Why is an impact evaluation being done'. As you read, make notes on how answers to these questions are likely to influence the method of impact evaluation. Make a note of the difference between 'simple', 'complicated' and 'complex' projects and how each type will require a different approach to impact evaluation.

❖ Winters P, Maffioli A, Salazar L (2011) Introduction to the special feature: evaluating the impact of agricultural projects in developing countries. *Journal of Agricultural Economics* **62**(2) 393–402.

This paper takes a look at the growing demand within the development profession for more rigorous evaluation of development interventions (especially through 'randomized control trials' and other experimental and quasi-experimental methods) and considers the implications for evaluating the impact agricultural projects. It relates, in particular, to item (4) in Section 3.2 of this unit. Don't worry too much about trying to understand the methods described in Section 4 of the reading itself as these are beyond the scope of this unit. Concentrate instead on the particular difficulties that are faced when trying to link cause and effect in agricultural projects.

FURTHER READINGS

Bravo-Ureta BE, Almeida AN, Solís D, Inestroza A (2011) The economic impact of Marena's investments on sustainable agricultural systems in Honduras. *Journal of Agricultural Economics* **62**(2) 429–448.

Cavatassi R, Salazar L, González-Flores M, Winters P (2011) How do agricultural programmes alter crop production? Evidence from Ecuador. *Journal of Agricultural Economics* **62**(2) 403–428.

Deaton A (2010) Instruments, randomization, and learning about development. *Journal of Economic Literature* **48**(2) 424–455.

Available from:
http://www.princeton.edu/~deaton/downloads/deaton%20instruments%20randomization%20learning%20about%20development%20jel%202010.pdf

Del Carpio XV, Loayza N, Datar G (2011) Is irrigation rehabilitation good for poor farmers? An impact evaluation of a non-experimental irrigation project in Peru. *Journal of Agricultural Economics* **62**(2) 449–473.

Dillon A (2011) do differences in the scale of irrigation projects generate different impacts on poverty and production? *Journal of Agricultural Economics* **62** (2) 474–492.

IFAD (2002) *Managing for Impact in Rural Development: A Guide for Project M&E*. International Fund for Agricultural Development (IFAD), Rome.

Available from: http://www.ifad.org/evaluation/guide/index.htm

Kusek JZ, Rist RC (2004) *A Handbook for Development Practitioners. Ten Steps to a Results-based Monitoring and Evaluation System.* The World Bank, Washington DC.

Available from:
http://portals.wi.wur.nl/files/docs/ppme/10steps2resultbasedMonitoring.pdf

This handbook provides a 'how to' guide for results-based monitoring and evaluation in the context of public sector management.

OECD (2002) *Glossary of Key Terms in Evaluating and Results-based Management*. OECD/DAC, Paris.

Available from: http://www.oecd.org/development/peer-reviews/2754804.pdf

Smutylo T (2005) *Outcome Mapping: A Method for Tracking Behavioural Changes in Development Programs*. ILAC Brief 7, Institutional Learning and Change (ILAC), International Plant Genetic Resources Institute (IPGRI), Rome.

Available from: http://www.idrc.ca/uploads/user-S/11235064481Brief-FINAL.pdf

This short briefing paper provides a summary of contemporary thinking about evaluation of development projects and programmes that complements conventional use of logical framework analysis and results-based management. Greater emphasis is placed on monitoring and evaluation of the processes by which development interventions are expected to achieve results, and on the anticipated changes in attitudes, behaviour and relationships of the actors and partners with which the intervention interacts.

UNDP (2002) *Handbook on Monitoring and Evaluating for Results*. United Nations Development Programme (UNDP) Evaluation Office, New York.

Available from:

http://web.undp.org/evaluation/documents/HandBook/ME-Handbook.pdf

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Caldwell R (2002) *Project Design Handbook*. CARE.

Available from:
http://portals.wi.wur.nl/files/docs/ppme/Project_Design_Handbook_CARE.pdf
[Accessed 22 May 2013]

Casley DJ, Kumar K (1987) *Project Monitoring and Evaluation in Agriculture*. The World Bank, Washington DC.

Deaton A (2010) Instruments, randomization, and learning about development. *Journal of Economic Literature* **48**(2) 424–455.

Available from:
http://www.princeton.edu/~deaton/downloads/deaton%20instruments%20randomization%20learning%20about%20development%20jel%202010.pdf
[Accessed 22 May 2013]

IFAD (2002) *Managing for Impact in Rural Development: A Guide for Project M&E*. International Fund for Agricultural Development (IFAD), Rome.

Available from: http://www.ifad.org/evaluation/guide/index.htm
[Accessed 22 May 2013]

Kusek JZ, Rist RC (2004) *A Handbook for Development Practitioners. Ten Steps to a Results-based Monitoring and Evaluation System.* The World Bank, Washington DC.

OECD (2002) *Glossary of Key Terms in Evaluating and Results-based Management*. OECD/DAC, Paris.

Available from: http://www.oecd.org/development/peer-reviews/2754804.pdf
[Accessed 11 December 2013]

Rogers P (2009) Matching impact evaluation design to the nature of the intervention and the purpose of the evaluation In: Chambers R, Karlan D, Ravallion M, Rogers P (2009) *Designing Impact Evaluations: Different Perspectives.* Working Paper 4 of the International Initiative for Impact Evaluation (3ie), New Delhi, pp. 24–31.

Available from: http://www.3ieimpact.org/en/evaluation/working-papers/working-paper-4/ [Accessed 22 May 2013]

Smutylo T (2005) *Outcome Mapping: A Method for Tracking Behavioural Changes in Development Programs*. ILAC Brief 7, Institutional Learning and Change (ILAC), International Plant Genetic Resources Institute (IPGRI), Rome.

Turrall S, Pasteur K (2006) *Pathways for Change: Monitoring and Evaluation. Learning from the Renewable Natural Resources Research Strategy.* DFID.

Available from:
http://www.research4development.info/pdf/ThematicSummaries/Brief3_Pathways_for_change_monitoring%20and%20evaluation.pdf [Accessed 22 May 2013]

UNDP (2002) *Handbook on Monitoring and Evaluating for Results*. United Nations Development Programme (UNDP) Evaluation Office, New York.

http://web.undp.org/evaluation/documents/HandBook/ME-Handbook.pdf   [Accessed 20 December 2013]

Woodhill J (2006) Monitoring & evaluation as learning: rethinking the dominant paradigm. *Sustaining livelihoods in Sub-Saharan Africa Newsletter*, Issue 21, African Institute for Community Driven Development.

Available from: http://led.co.za/document/monitoring-evaluation-learning-rethinking-dominant-paradigm [Accessed 22 May 2013]

World Bank IEG (2007) *Water Management in Agriculture: Ten Years of World Bank Assistance, 1994–2004*. The World Bank Independent Evaluation Group (IEG), Washington DC.

Available from:
http://lnweb90.worldbank.org/oed/oeddoclib.nsf/InterLandingPagesByUNID/116A7B237B9C05C285257280006133D7 [Accessed 22 May 2013]

MULTIMEDIA

CGD (2011) *Impact Evaluations and the 3ie: William Saveoff.* Global Prosperity Wonkast Center for Global Development. Duration: 22 minutes.

Audio file available from:
http://blogs.cgdev.org/global_prosperity_wonkcast/2011/05/02/impact-evaluations-and-the-3ie-william-savedoff/

Podcast on the growing interest in rigorous impact evaluations of development interventions.

1.0 An introduction to monitoring and evaluation

Section Overview

This section introduces this unit by explaining the nature and purposes of project monitoring and evaluation, and the differences between these two complementary but distinct activities.

Section Learning Outcomes

By the end of this section, students should be able to:

- understand what M&E is, and the difference between monitoring, and evaluation

- have an awareness of why M&E is important

1.1 What is M&E?

M&E is a process of continual gathering of information and assessment of it in order to determine whether progress is being made towards pre-specified goals and objectives, and to highlight whether there are any unintended (positive or negative) effects from a project and its activities. It is an integral part of the project cycle and of good management practice.

In broad terms, monitoring is carried out in order to track progress and performance as a basis for decision-making at various steps in the process of an initiative or project. Evaluation, on the other hand is a more generalised assessment of data or experience to establish to what extent the initiative has achieved its goals or objectives.

> ✎ Before you read on, list some of the key reasons why you think M&E is carried out?

M&E is carried out for many different purposes.

Monitoring systems provide managers and other stakeholders with regular information on progress relative to targets and outcomes. This enables managers to keep track of progress, identify any problems, alter operations to take account of experience, and develop any budgetary requests and justify them. This enables the early identification of problems so that solutions can be proposed. It is considered to be a critical part of good management.

Periodic evaluation is also considered to be good practice, and can be used to investigate and analyse why targets are or are not being achieved. It looks at the cause and effect of situations and trends which are recorded within monitoring.

Periodic and formal evaluation are vital for internal reporting and auditing, and are also requested by funding agencies – often as mid-term and final evaluations. External stakeholders and funding agencies who are accountable to donors or are part of the public sector, need to see results and demonstrable impacts.

However, it should be recognised that ongoing or 'informal' evaluation should always be available as a tool to managers, not only to meet the requirements of governments and donors, but also as a means of understanding when and why things are going right or wrong during project implementation.

M&E is also important for incorporating the views of stakeholders, particularly the target population and can be a further mechanism to encourage participation and increased ownership of a project.

Thus, the key reasons for M&E can be summarised under four headings.

(1) For accountability: demonstrating to donors, taxpayers, beneficiaries and implementing partners that expenditure, actions and results are as agreed or can reasonably be expected in the situation.

(2) For operational management: provision of the information needed to co-ordinate the human, financial and physical resources committed to the project or programme, and to improve performance

(3) For strategic management: provision of information to inform setting and adjustment of objectives and strategies.

(4) For capacity building: building the capacity, self-reliance and confidence of beneficiaries and implementing staff and partners to effectively initiate and implement development initiatives.

Monitoring and evaluation should be evident throughout the lifecycle of a project, as well as after completion. It provides a flow of information for internal use by managers, and for external use by stakeholders who expect to see results, want to see demonstrable impacts, and require accountability and trustworthiness on the part of the public sector.

Governments and organisations are accountable to stakeholders and this requires them to both achieve expected outcomes and be able to provide evidence that demonstrates this success. As a consequence increasing attention is now being given to funding rigorous impact evaluations that are capable of providing solid empirical evidence about whether or not a particular type of development intervention works. Producing this evidence is technically challenging and expensive and won't be feasible for all or even the majority of projects. Nevertheless, as a vehicle of policy research it can, when applied to particular kinds of project, help inform decisions about how to allocate resources between different types of intervention, and between different project designs. The demand for rigorous impact evaluation clearly has implications for the design of M&E systems, and is most likely to be met if the project and associated M&E system are designed with this rigour in mind from the outset.

Monitoring and evaluation of projects can be a powerful means to measure their performance, track progress towards achieving desired goals, and demonstrate that systems are in place that support organisations in learning from experience and adaptive management.

Used carefully at all stages of a project cycle, monitoring and evaluation can help to strengthen project design and implementation and stimulate partnerships with project stakeholders.

At a **sector** level monitoring and evaluation can:

- improve project and programme design through the feedback provided from mid-term, terminal and *ex post* evaluations

- inform and influence sector and country assistance strategy through analysis of the outcomes and impact of interventions, and the strengths and weaknesses of their implementation, enabling governments and organisations to develop a knowledge base of the types of interventions that are successful (ie what works, what does not and why)

- provide the evidential basis for building consensus between stakeholders

At **project** level monitoring and evaluation can:

- provide regular feedback on project performance and show any need for 'mid-course' corrections

- identify problems early and propose solutions

- monitor access to project services and outcomes by the target population;

- evaluate achievement of project objectives

- measure the impact of the project on various indicators (including those relating to project objectives and other areas of concern)

- incorporate stakeholder views and promote participation, ownership and accountability

1.2   The differences between monitoring and evaluation

It is useful to explore the differences between 'monitoring' and 'evaluation' in more depth. Some concise definitions are provided in 1.2.1, below.

1.2.1 Definitions of monitoring and evaluation

Monitoring is the continuous collection of data on specified indicators to assess for a development intervention (project, programme or policy) its **implementation** in relation to activity schedules and expenditure of allocated funds, and its **progress and achievements** in relation to its objectives.

Evaluation is the periodic assessment of the **design, implementation, outcomes and impact** of a development intervention. It should assess the relevance and achievement of objectives, implementation performance in terms of **effectiveness** and **efficiency**, and the **nature, distribution** and **sustainability** of impacts.

Source: unit author, (adapted from OECD (2002), Casley and Kumar (1987)

It is clear that monitoring and evaluation are different yet complementary. **Monitoring** is the process of routinely gathering information with which to make informed decisions for project management. Monitoring provides project managers with the information needed to assess the current project situation and assess **where** it is relative to specified targets and objectives – identifying project trends and patterns, keeping project activities on schedule, and measuring progress toward expected outcomes. Monitoring can be carried out at the project, programme or policy levels.

Monitoring provides managers and other stakeholders with regular information on progress relative to targets and outcomes. It is descriptive and should identify actual or potential successes and problems as early as possible to inform management decisions. A reliable flow of relevant information during implementation enables managers to keep track of progress, to adjust operations to take account of experience and to formulate budgetary requests and justify any needed increase in expenditure. Indeed, an effective **management information system** that performs these functions is an essential part of good management practice.

Evaluation, on the other hand, gives information about **why** the project is or is not achieving its targets and objectives. Some evaluations are carried out to determine whether a project has met (or is meeting) its goals. Others examine whether or not the project hypothesis was valid, and whether or not it addressed priority needs of the target population. Depending on the purpose of a particular evaluation, it might assess other areas such as achievement of intended goals, cost-efficiency, effectiveness, impact and / or sustainability. Evaluations address: 'why' questions, that is, what caused the changes being monitored; 'how' questions, or what was the sequence or process that led to successful (or unsuccessful) outcomes; and 'compliance and accountability' questions, that is, did the promised activities actually take place and as planned? Evaluations are more analytical than monitoring, and seek to address issues of causality. A baseline study is the first phase of a project evaluation. It is used to measure the 'starting or reference points' of indicators of effect and impact.

Frequent evaluation of progress is good management practice. It seeks to establish causality for the situations and trends recorded by monitoring. Clearly evaluation should respond when monitoring identifies either problems or opportunities to enhance achievements. Managers should use evaluation results to make adjustments to the

design and implementation of their project or other interventions. Periodically this can be formalised to involve the recipient government and donor in one or more formal reviews such as a mid-term evaluation. Terminal evaluations are similarly formalised and typically conducted at the end of the intervention to provide the information for completion reports. An *ex post* evaluation may be completed a further period after completion, when it is reasonable to expect the full impacts of the intervention to have taken place.

Ongoing, 'process' or informal evaluation occurs during the course of the project as part of good management practice to assess activities or functions and to make recommendations for improving project implementation. Summative evaluations are carried out at the end of a funding period to assess positive and negative impacts and examine the effectiveness of a project. These are often termed 'impact assessments'. Lessons learned from final evaluations should contribute to the formation of future projects and programs.

Such formalised and periodic evaluations are important for the internal reporting and auditing procedures of the organisations involved, and as a means to document experience and feed back into the planning of future interventions. It should be recognised, however, that evaluation is always available as a mode of analysis that can help managers and other stakeholders to understand all aspects of the work at hand. This applies from design stages, through implementation and on to completion and final outcomes. The terms 'informal' or 'ongoing' evaluation can be used to describe evaluation that is conducted primarily by managers themselves as a key part of effective management and project implementation.

Project level M&E systems should overlap with and feed into public sector management information systems. These generally place emphasis on the use of information streams that are more or less continuous, and which can be trusted and used in real time for decision-making.

When monitoring and evaluation is effective knowledge should accumulate in the experience and expertise of staff, in the documented institutional memory of the organisation and its partners, and in their planning and management procedures.

Section Summary

- The section explained why monitoring and evaluation are important and defined these concepts and the differences between them.

Section 1 Self Assessment Questions

Question 1

True or false?

   (a) Monitoring is useful for identifying problems early within the progress of a project.

   (b) Impact assessment can be considered to be a type of evaluation.

   (c) Evaluation can only be carried out at the mid-way point and end of a project.

Question 2

List ten complementary roles that monitoring and evaluation can play – five for monitoring and five for evaluation.

2.0   DESIGN AND IMPLEMENTATION OF M&E SYSTEMS

Section Overview

This section explains what can go wrong with project M&E systems and sets out a framework of concepts and principles that can aid the design and implementation of effective project M&E. It provides the core of a guidance manual or handbook for professional work in this field.

Section Learning Outcomes

By the end of this section, students should be able to:

- understand the M&E systems and their relation to the logical framework analysis

- be familiar with the challenges of M&E and the concepts of results-based management

2.1   M&E systems and common deficiencies

A monitoring and evaluation system is made up of the set of interlinked activities that must be undertaken in a co-ordinated way to plan for M&E, to collect and analyse data, to report information, and to support decision-making and the implementation of improvements.

> ✍ Think to yourself for a few moments about what you think constitutes the main aspects of an M&E system for a rural development project.

The key parts of an M&E system are succinctly set out in 2.1.1.

2.1.1 The six main components of a project M&E system

- Clear statements of measurable objectives for the project and its components.

- A structured set of indicators covering: inputs, process, outputs, outcomes, impact, and exogenous factors.

- Data collection mechanisms capable of monitoring progress over time, including baselines and a means to compare progress and achievements against targets.

- Where applicable building on baselines and data collection with an evaluation framework and methodology capable of establishing causation (ie capable of attributing observed change to given interventions or other factors).

- Clear mechanisms for reporting and use of M&E results in decision-making.

- Sustainable organisational arrangements for data collection, management, analysis, and reporting.

Source: unit author

The design of an M&E system should start at the same time as the overall project preparation and design, and be subject to the same economic and financial appraisal, at least to achieve the least-cost means of securing the desired objectives. Such practice has been followed for projects in recent years. Problems arose with earlier M&E systems that were set up after the project had started. Often this was left to management alone, who by that time already had too much to grapple with and could not provide sufficient time, resources or commitment.

The 'supply side' of M&E design should not be overlooked. Skilled and well-trained people are required for good quality data collection and analysis. They may be a very scarce resource in developing countries, and should be 'shadow-priced' accordingly when appraising alternative M&E approaches. It is inevitable that the system designed will not be as comprehensive as is desirable, and will not be able to measure and record all the relevant indicators. It is here that the project analyst must use the tools of economic appraisal, and judgment based on experience, to find the best compromise.

Evaluations of existing M&E systems by agencies have shown certain common characteristics, weaknesses, and recurrent problems which are important causes of divergence between the theory of M&E and actual practice in the field. These are worth bringing to the attention of both designers and operators of M&E systems, as problems to be avoided in the future:

- poor system design in terms of collecting more data than are needed or can be processed

- inadequate staffing of M&E both in terms of quantity and quality

- missing or delayed baseline studies. Strictly these should be done before the start of project implementation, if they are to facilitate with and without project comparisons and evaluation

- delays in processing data, often as a result of inadequate processing facilities and staff shortages. Personal computers can process data easily and quickly but to make the most of these capabilities requires the correct software and capable staff

- delays in analysis and presentation of results. These are caused by shortages of senior staff, and by faulty survey designs that produce data that cannot be used. It is disillusioning and yet common for reports to be produced months or years after surveys are carried out when the data have become obsolete and irrelevant. This is even more the case when computer printouts or manual tabulations of results lie in offices, and are never analysed and written up

- finally, even where monitoring is effective the results often remain unused by project staff

Experience from the World Bank-funded agricultural water management projects, reflecting upon the quality of M&E systems carried out by the projects, is highlighted in 2.1.2, below.

2.1.2 Recent M&E practice in agricultural water management projects

The World Bank's assistance to agricultural water management was the subject of an Impact Evaluation Group (IEG) Portfolio Review (World Bank IEG (2006) *Water Management in Agriculture: Ten Years of World Bank Assistance, 1994–2004*). Between 1994 and 2004 the Bank lent a total of $13.2 billion for 161 projects across 56 countries that included quantifiable agricultural water management components. These projects directly benefited up to 12 million households and more than 60 million people.

The review concluded that:

The overall quality of M&E design improved in the late 1990s with the introduction of logical frameworks and their mandatory use in Project Appraisal Documents.

Project M&E often did not provide adequate information to inform Bank management of progress toward strategic objectives, particularly poverty alleviation and the Millennium Development Goals (MDGs).

Projects rarely adequately distinguished between the functions of monitoring and evaluation, usually describing monitoring functions only. Thus use of a rigorous evaluation framework was often missing from project planning and implementation, making robust attribution of benefits difficult. Slightly fewer than half the projects did not have any means of verifying project impacts — no surveys or baselines — even though more than two-thirds of them included outcome or impact indicators. Only a third of completed projects had a baseline before the project started and less than half attempted to establish a baseline during the project (slightly more than 20% never established a baseline). Only 11% of projects were designed to have the tools that would allow rigorous impact assessment, specifically this includes well-defined output and outcome indicators, good baselines, and independent control groups unaffected by project interventions that allow the counterfactual (situation without the project) to be determined. Another 41% were able to allow determination of what happened before and after project implementation, but not a robust attribution of observed changes.

Projects that had civil works components had quite good monitoring and evaluation systems to track inputs and related outputs, but the quality of the systems declined as the focus moved on to outcomes and impacts. In general most attention had been given to monitoring indicators of project implementation to provide feedback for better management.

Even when there was good M&E design, inadequate supervision sometimes reduced effective implementation, and a need for more training was indicated.

Source: unit author

The basic deficiencies that lead to such problems are now widely recognised, though that does not ensure that the same mistakes are not still made. M&E systems impose a high additional recurrent cost on project implementation, while the benefits are neither quantifiable in terms of increased production, nor may even be readily apparent in the short term.

It is imperative that such errors and failures are avoided if governments and international institutions are not to lose faith in M&E as an aid to successful project implementation.

Even with a good design for M&E, experience shows that success during implementation depends heavily on a sense of ownership by the government, adequate capacity in public sector institutions, and sustained interest from the project managers throughout the life of the project. Two factors are important here. One is that a sense of ownership

of the project provides a stimulus to transparent management and good information about progress. The other is that often countries may doubt the value of adopting what may be costly and time-consuming procedures to collect, analyse, and report information. In such circumstances sound design is especially important. Monitoring information needs to provide a clear input into management decision-making. It is also helpful if early gains can be demonstrated from monitoring and if institutional procedures can be developed that encourage the use of monitoring data to trigger and support implementation decisions from the start.

2.2 Key design principles for project monitoring and evaluation

Project M&E design can be guided by the concept of project logic and logical framework analysis. Implicitly or explicitly a good project design will be based on a clear and logical project strategy. This is usually made explicit in the form of a logical hierarchy of relationships between the various project elements; progress at each level being a precondition for achievement at the next higher level. In other words, achievement at one level provides the means for achievement at the next higher level, based on tried and tested processes and established technical relationships, but subject to identified key assumptions and risks.

2.2.1, below, illustrates the causal relationships that provide the conceptual linkages between the project elements. It is necessary to establish these in order to be able to design a sound M&E system. Note that a complex project may have more than one objective, and it may be necessary to define the strategy or causal chain of each project component. The logical framework analyses of different project components can then be 'nested' or linked together. This recognises that the objective and ultimately the impact of one sub-project or project component can be an outcome for the main project or overall programme.

Note that any project strategy cast as a logical hierarchy simplifies reality and cannot account for all details of the intended plan and its context. Thus the documented strategy is a management tool that needs continual review and adjustment to reflect current contexts and changing needs. The ability to adjust the strategy depends on clarity about what project management is capable of influencing and achieving, and on having the information necessary. Monitoring and evaluation provides the key to the latter.

2.2.1 Logical hierarchy of project design

Means-ends chain	equals	Logical project design	subject to	Required conditions being in place
End		Development goal		
↑		↑		Necessary conditions
End (means)		Project purpose		
↑		↑		Necessary conditions
End (means)		Outputs		
↑		↑		Necessary conditions
End (means)		Activities		
↑		↑		Necessary conditions
Means		Inputs		

Thus:

IF inputs are provided, THEN activities can take place;

IF activities are successfully completed, THEN planned outputs should result;

IF outputs are used as intended, THEN the project purpose should be realised, and;

IF the purpose is achieved then the expected contribution should be made to the development goal(s).

Source: unit author

A logical project strategy (2.2.1) provides a structure for the design of project monitoring and evaluation (2.2.2, below).

2.2.2 A logical structure for project monitoring and evaluation

Project logic	Types of indicator	Focus of M&E	Characteristics
Goal	Impact	Results monitoring	long-term widespread improvement in society
Purpose	Outcome		intermediate effects for beneficiaries
Outputs	Output	Implementation monitoring	capital goods, products and services produced
Activities	Process		tasks undertaken to transform inputs to outputs
Inputs	Input		human and material resources

Source: unit author

Using the terminology in 2.2.1, the extent to which the project contributes to its development goal(s) is the **impact** of the project (there may also be unintended impacts, both positive and negative). The achievement of project purpose is measured in terms of results, which are the extent to which the observable outcomes are as planned. Monitoring at these two levels is usefully referred to as **'results monitoring'**. Lastly the operation and performance of the project can be assessed in terms of the effectiveness and efficiency of the processes through which inputs are utilised to produce the planned outputs. This can be usefully referred to as **'implementation monitoring'**. Thus, there are clear relationships between the levels of a project's logical hierarchy, the types of indicators needed, and the focus for monitoring and evaluation.

There should also be a clear relationship between implementation monitoring, the day-to-day implementation of the project in terms of procurement and all activities, and the financial management of the project. Thus, a reconciliation should ultimately be possible between financial disbursement and expenditure, records of physical activities and processes, and the key indicators used for implementation monitoring.

Communicating the project strategy to all project implementing partners and stakeholders through the use of clear and logical statements is essential. Even if logical framework analysis and its terminology is not fully used, there should be clear understanding and a consensus about the objectives to be achieved, what will be implemented and over what timescale. Without this it is difficult to know what should be monitored, and how the performance of a project and the changes it brings can be evaluated.

Moving from monitoring to evaluation requires the use of criteria. 2.2.3, below, defines core criteria commonly used in the evaluation of development projects, and of sector and policy level interventions.

2.2.3 Evaluation criteria

Impact	The effect of the project on its wider environment, and its contribution to the wider policy, sector, PRSP or Country Assistance Strategy development objectives.
Relevance	The appropriateness of project objectives to the problems intended to be addressed, and to the physical and policy environment within which the project operates.
Effectiveness	How well the outputs contributed to the achievement of project purpose and the overall goal(s), and how well assumed external conditions contributed to project achievements.
Efficiency	Whether project outputs have been achieved at reasonable cost, ie how well inputs have been used in activities and converted into outputs.
Sustainability	The likelihood that benefits produced by the project continue to flow after external funding has ended.

Source: unit author

2.2.4 shows how these criteria are in turn linked to logical project design and to the types of indicator, completing this overview of how project design and the planning of monitoring and evaluation should be closed linked.

2.2.4 Linking project design and evaluation criteria

Project logic	Types of indicator	Evaluation criteria	
Goal	Impact	relevance and impact	sustainability
Purpose	Outcomes	relevance and impact	sustainability
Outputs	Output	effectiveness and efficiency	sustainability
Activities	Process	effectiveness and efficiency	sustainability
Inputs	Input	effectiveness and efficiency	sustainability

Source: unit author

2.3 The limits of project management

The ability of managers to use the information produced by monitoring and evaluation to adjust a project's strategy during implementation will depend on the flexibility of the project's design and management arrangements.

If a project is 'process-oriented' and designed with an open-ended strategy, then general directions will be indicated but with freedom for project partners to refine the operation of the project as it proceeds. The more flexible the situation, the more a good monitoring and evaluation system is necessary to provide managers with the information needed to be responsive and adaptive, and the more the M&E system itself will need to evolve over time as implementation proceeds.

If a project is 'blue-print' oriented and more rigidly designed, the opportunities to adjust the strategy may be restricted to periodic opportunities such as mid-term reviews. For such projects M&E findings will be critical in informing and providing the justification for change, when change is needed. The design of the M&E system from the commencement of the project will in turn be more 'blue-print' oriented, although this should not completely rule out flexibility and the possibility of change.

In response to information gained from M&E project management can be expected to adjust those elements of a project that are within its control, but control over the factors that influence the achievement of objectives diminishes with each higher level of the hierarchy. It is reasonable to hold project management accountable for achievement up to the level of the project purpose and thus monitoring and evaluation by management at this level is crucial. This is particularly true during the early stages of a project when change is easiest.

For higher level goals to be achieved there may be necessary external conditions that are beyond the direct control of project management. A range of factors may influence the impacts that occur, and managers may be only one of several stakeholder groups and agencies that contribute to achievements. Thus at higher levels in the hierarchy a project's accountability diminishes, although it does not disappear entirely.

When monitoring and evaluation reports achievement of the project purpose but failure to contribute to higher development goals as expected, it means that either the project design is faulty, or that the supporting external conditions were not as assumed. In both cases, response is needed from all project partners, led by the supervising governmental agency and funding organisation, and informed by the lessons from monitoring and evaluation. In some cases, the response necessary to improve impact may be at a sectoral rather than project level.

2.4 The challenges of outcome and impact monitoring and evaluation

Given that 'inputs', 'activities' and 'outputs' are within the direct control of project management, 'implementation monitoring' and evaluation is a core management function, and achievable largely through internal record-keeping and analysis. Indicators of inputs, process and outputs are usually generated by project management, and/or by government and funding agency accounting and reporting requirements. Attention to detail and good data management systems are important, but conceptually and methodologically this should be straightforward and a standard aspect of good management practice.

Difficulty increases at the levels of 'outcomes' and 'objectives'. These are the subject of 'results monitoring'. For 'results monitoring' indicators are subject to the twin problems of **measurement** and **attribution**. First, for an indicator to be useful it is necessary to be able to measure whether change has occurred over time compared to a 'baseline'. This is problematic for indicators which are subject to considerable annual or seasonal variability, and thus require a long time series of values for a trend to be determined with statistical validity. Crop yields are a typical example, and one highly relevant as an outcome indicator for many rural development projects. At least five or more years' data will typically be needed to show that yields have improved, and this requirement may be even greater in regions subject to highly variable rainfall. In agriculture such variability in production, compounded by the typical co-variance between producers in a given location, can feed through into volatility in other key 'outcome' and 'impact' indicators such as food prices, rural employment and rural household incomes.

This measurement problem can be compounded by practical problems that are typically most severe in resource poor and remote regions. Recording of crop yields, for example, will require a survey that takes either physical samples or relies on farmer estimates. Both approaches will be subject to sampling and other errors that can only be reduced through intensive training and supervision of enumerators; activities that are costly and time consuming.

Data series may already exist for some typical outcome and impact indicators and subject to an assessment of their quality should be used in preference to new data collection. However, where there are gaps, M&E survey designers need to pay particular attention to comparability with the existing data when selecting survey instruments and methods. Even under conditions of close supervision and rigorous design, small changes in the way in which questions are put, the layout of the survey form, and guidance given to enumerators can undermine comparability. This is particularly likely to apply to indicators of household consumption and income, and other measures of poverty.

Assuming such measurement problems can be solved, and change over time can be observed with statistical validity for an indicator of outcomes or impact, the second of the twin problems is that of attribution. Establishing that the cause of the observed trend is the project and not one or more external factors requires a rigorous evaluation framework. A range of formal approaches are available, all essentially requiring the observed change to be tested against a reliable counterfactual (the situation that would have happened had the project not taken place).

Whilst not insoluble, this problem is often challenging for agricultural and other rural development projects, and again will require considerable time, resources and expertise. The best practical guidance manuals for project M&E have emphasised the effective use of leading indicators, as described below, as a priority before resources are devoted to ambitious and formal evaluation approaches.

It is also worth noting that attribution of outcomes and impacts will be easier in some sectors than others and usually easier at a project level than a programme or policy level. Generally, attribution is easier within sectors that deal primarily with non-human/non-social environments within which interventions can be isolated and measured, and more difficult in complex human and social environments in which linear logical models and hypothesis testing methodologies may be inapplicable. Simple project level interventions with explicit, measurable objectives, carried out in a short time frame will also be more amenable to impact evaluation than programme level interventions or policy reforms which involve sets of interventions aimed to achieve complementary sets of changes across a region, sector or country. Inferring causation at this level of analysis is extremely difficult, if not impossible.

These methodological issues are returned to elsewhere in this unit. The key points to note here are that the monitoring and evaluation of outcome and impact indicators will require considerable time and resources. This particularly applies when 'formal' methods that can produce results with statistical validity are to be used, but it also applies to the use of more qualitative methods and to a focus on processes as well as outcomes and impacts. Thus adequate human resources and expertise are essential for what is, for all practical purposes, an exercise in applied inter-disciplinary research. These methodological challenges and requirements for staff with applied research skills may be beyond the capacity of the project management organisation, and if so, the services of national agencies and/or external specialists (consultants) will be required.

2.5   The role of leading indicators

Whether 'results monitoring' and evaluation is carried out by project management or by specialists, information about project outcomes and impact will rarely be available to inform and improve project management during the early or mid stages of the project. In particular, there is usually a lag between agricultural development activities and results. It is important to recognise this lag, which can be as much as two years (or longer for some perennial crops), especially as disbursements tend to peak over the last years of the project after a slow start. It will therefore usually be important for project managers to identify and use some 'leading indicators' of project performance during the early stages of implementation.

Leading indicators, sometimes also called 'early outcome indicators', are those that can provide an early indication of whether an expected change will occur, before project implementation is complete, and before the expected change has taken place. For example, 'market research' type data covering whether beneficiaries have **access** to, are **using**, and are **satisfied** with project investments and services can provide leading indicators of anticipated outcomes and impact.

The assumption is that if the beneficiaries are both satisfied and actively taking up the services of the project, or participating in their management and delivery, then it is likely that expected outcomes and impact would be achieved. This approach has also been referred to in the literature as **'beneficiary contact monitoring'**.

Other leading indicators might be identified to provide early warning about the non-fulfilment of necessary external conditions. Such examples could include farmgate price levels compared to those expected, inadequate availability of farm inputs, slow progress in road construction, or a lack of investments by traders in anticipation of receiving increased volumes of produce or higher demand for farm inputs.

For both leading and final indicators of outcomes and impact a degree of pragmatism may often be necessary in the choice of indicators and data collection methods, depending on project characteristics and available resources. Use of case studies, participatory and other informal methods of data collection may be more cost-effective than formal survey methods designed to pass tests of statistical validity, although not necessarily less demanding in terms of the experience and skills required.

One significant advantage of beneficiary contact monitoring and some other leading indicators, however, is that formal and statistically rigorous data collection methods can be used, without the overload of time, data, complexity and expense often associated with such methods. A one or two page questionnaire administered to a random sample of 70–100 farmers, for example, can provide the key information needed on their reactions to project interventions and services. Given staff with the necessary capacity, such a survey can be designed, pre-tested, implemented, analysed and reported within no more than one month.

It is also pragmatic to recognise that the practical problems of attributing causality, and the complexity of the statistical analysis involved, may mean that it is more cost-effective to rely on leading indicators such as delivery of services and beneficiary response than to attempt to measure actual impacts for many projects.

2.6   Results-based monitoring and evaluation

Governments and international development agencies are increasingly being called upon to demonstrate results. Besides demands for greater accountability and transparency, stakeholders are also demanding greater efficiency and effectiveness of development actions. As a result, a number of development agencies are promoting a results-management framework as a strategic approach to be applied in all aspects of the project cycle. Results-based monitoring and evaluation places particular emphasis on outcomes and impact. It emphasises that it is not sufficient simply to determine that planned outputs have been delivered on time and on budget. The 'ends' are more important than the 'means' and it is necessary to determine, and show evidence that, planned outcomes and a worthwhile contribution to national goals are being achieved.

A results-based management approach should enhance public sector performance generally, and is particularly applicable for programme and policy interventions at sector level which adopt a flexible approach to implementation, and for which 'inputs', 'activities' and 'outputs' may not be fully specified in advance.

However, at project level it would be harmful if the focus on outcomes and impacts led to the neglect of core management information systems that cover the project inputs, processes and outputs which good outcomes ultimately depend on. Similarly, the role of leading indicators of outcomes and impact for use by project managers should not be neglected. Results-based management for projects needs to build upon monitoring and evaluation systems that are initially focused on the implementation and performance of projects, but which can progress to evaluation of outcomes and impact as implementation proceeds. Where the costs of overcoming the methodological and practical challenges of outcome and impact evaluation are prohibitive, or when human resources are inadequate, full and rigorous impact evaluation may need to be applied selectively to those projects that are most significant because of their scale or innovation, or because they are representative of other similar interventions.

A results-based approach is particularly important if a project is 'process-oriented' and designed with an open-ended strategy, general directions being indicated but detailed work plans and resource provision not specified in advance. This may also apply to many sector level interventions. Clearly, it may not be possible to initially develop a full logical framework analysis of inputs, activities and outputs for the purposes of planning, although if useful this can be developed as a management tool during implementation for project or programme components, once these are agreed by project partners and take shape 'on the ground'.

For all projects, a focus on results-based management also puts pressure on the project manager and other members of the task team to change or adapt the project if it is not demonstrating that it can achieve the desired outcomes; looking ahead at achievements, rather than inwardly and narrowly at processes.

These observations apply to many rural development projects, especially those involving substantial investments in community-level organisations and institutions, and supporting human resource and other management systems. These are complex projects to implement and require flexible and adaptive implementation and operation if they are to achieve their optimal performance, outcomes and impact.

The selection of indicators for results-based M&E needs to be based on the logic of the project design (as outlined above) and the generation of management information must be linked to the phasing of the project. Having the right information at the right time, in the right place and in the right form is the key to successful responsive and adaptive management, and to informed and supportive project partners and wider stakeholders.

Monitoring progress towards higher level development objectives requires that information be derived from all levels in the logic model of the project, at different time frames, and for different stakeholder needs. This is a management function and project managers must take responsibility for knowing how well the project is being implemented and whether leading indicators suggest that continued implementation will generate the expected outcomes and impact or whether corrective action is needed. Managers should also ensure that reliable evidence of impact can ultimately be produced to demonstrate accountability and to feedback into the planning of further interventions.

Supervising organisations must similarly make effective use of the information generated to facilitate flexibility in project management, allowing timely corrective

adjustments to be made to implementation, and continually seek to improve the development effectiveness of programme and policy-level interventions. This will require mechanisms to be institutionalised that feedback the lessons from monitoring and evaluation into planning and supervision processes.

2.7 Contemporary evaluation challenges and responses

Although there is emphasis in international development on accountability and the ability to demonstrate results, there is also emphasis on enhancement of the processes of development, with investments made that seek to improve governance, institutional development and learning, capacity development, and participation and empowerment. This and the challenges of outcome and impact evaluation discussed above are leading to a renewed emphasis on understanding the processes through which development interventions work.

'**Outcome mapping'** is an approach that focuses on change processes and their outcomes. It defines the limits of a project's or programme's influence, promotes strategies that fit the situation and recognises the importance of the actions and contributions of all the stakeholders involved. M&E focuses on monitoring and reporting the changes in behaviour of the actors involved in or directly influenced by the project, with project performance assessed in terms of its contribution in making those changes. Outcome mapping is particularly relevant to projects where success depends on behavioural or social change with, for example, data on the behaviour of farmers complementing that on physical parameters such as crop yield or forest status. Outcome mapping still requires that clear project objectives have been set, for example, through the use of problem and objective trees, logical framework analysis and stakeholder consultation. Given a clear logical design and strategic direction, the approach can be used to chart the activities of project staff and partners and progress towards the anticipated results. Data collection tools thus take the form of journals and other record keeping, whilst data collection methods veer towards case studies and direct participant observation.

2.7.1 The logical framework sequence including pathways between different elements
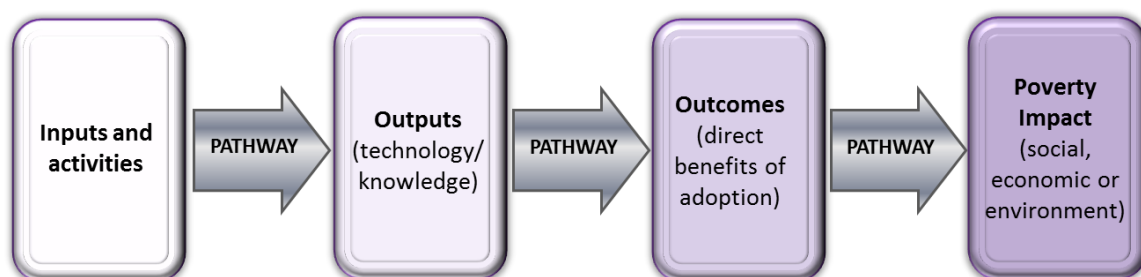
Source: Turrall and Pasteur (2006) p. 4.

Similarly, 'pathway analysis' has emerged as a response to recognition that a focus only on the elements of the Logframe (inputs, activities, outputs, outcomes) can mean that some of the intervening processes are not adequately taken into account. In agriculture and natural resource management, for example, the relationships between these elements are reliant on processes or pathways that facilitate the adoption and adaptation of research outputs or other project products and services. Pathway analysis enables project management to take greater account of the wide range of factors or processes that may facilitate or impede a planned outcome or impact. The focus is upon mapping and monitoring the process of moving from one stage to another (2.7.1).

Although the recent literature generally fails to acknowledge it, the antecedents of both 'outcome mapping' and 'pathway analysis' lie in the use of leading indicators and the concept of beneficiary contact monitoring. They also lie in the application of a healthy dose of common sense in project M&E, and recognition that the capacity of project management is key. Good managers understand the processes they are seeking to implement and the people and organisations they are working with. They engage with, support and influence their partners in the project, and they continually collect and interpret information on how well they are performing their job.

Section Summary

- The section started by exploring what is an M&E system, and the key components of it. It went on to look at the experience of M&E systems and the 'room for improvement'.

- Key design principles based on use of the logical framework as a structure for M&E were then explored, identifying the types of indicators which can be used to measure change at all levels.

- The difficulty involved in assessing indicators of outcomes and impacts was discussed, particularly in terms of attribution and measurement, and the importance of leading indicators was emphasised.

- The concepts of Results-Based monitoring and evaluation were critically assessed in the context of the varying requirements of public sector management of policy implementation and programmes, and of project management agencies, and similarly, in relation to 'process' and 'blueprint' oriented project design and implementation.

- Throughout the section, the importance of a management perspective to project monitoring and evaluation was emphasised, and that from use of leading indicators through beneficiary contact monitoring to outcome mapping and pathway analysis an understanding of process is as important as the ability to measure results.

Section 2 Self Assessment Questions

Question 3

Allocate the following to the correct cells to complete the table.

(a) effectiveness and efficiency

(b) implementation monitoring

(c) relevance and impact

(d) results monitoring

Project logic	Types of indicator	*Focus of M&E*	Evaluation criteria
Goal	Impact		
Purpose	Outcome		
Outputs	Output		
Activities	Process		
Inputs	Input		

Question 4

Place the following phrases in their correct place in the table below. Then choose two of the arrows to indicate the direction of 'degree of control' and 'challenge of M&E' in the diagram.

(a) what is within the direct control of

(b) what the project is expected to contribute to

(c) what the project can be expected to achieve and be accountable

				Degree of control	Challenge of M&E
Logic					
Goal					
Purpose				Decreasing control	Increasing difficulty
Outputs					
Activities					
Inputs					

Question 5

True or false?

(a) A results-based management approach is particularly applicable for programme and policy interventions at sector level which adopt a flexible approach to implementation, and for process oriented projects for which 'inputs', 'activities' and 'outputs' may not be fully specified in advance.

(b) At project level it is never harmful if a focus on results leads to neglect of core management information systems that cover project inputs, activities and outputs.

(c) The use of leading indicators of outcomes and impact is an essential part of good management practice by project managers.

3.0 COMPONENTS OF MONITORING AND EVALUATION SYSTEMS

Section Overview

This section provides guidance on how to plan and implement a project M&E system. It reviews the main steps and approaches required and concludes with a discussion of how to create a learning environment for project implementation.

Section Learning Outcomes

By the end of this section, students should be able to:

- plan monitoring and evaluation for a development project
- understand the key elements of a learning environment

3.1 Planning and implementing a project monitoring and evaluation system

Setting up a project M&E system involves nine steps (3.1.1). These need to be considered in the planning stage and then fulfilled at project start-up and throughout project implementation.

3.1.1 Steps in planning a project M&E system

(1) Assess the existing readiness and capacity for monitoring and evaluation

(2) Establish the purpose and scope of M&E

(3) Identify and agree with stakeholders the project's outcomes and development goal(s)

(4) Select key indicators and an evaluation framework

(5) Set baselines and plan data collection and analysis

(6) Select results targets

(7) Plan monitoring, data analysis, communication and reporting

(8) Plan the form and timing of critical reflection and interim evaluations

(9) Plan for the necessary conditions and capacities

Source: unit author

Key points for each of these nine steps are outlined below.

(1) Assess the existing readiness and capacity for monitoring and evaluation

- Review current capacity within the organisation and its partners which will be responsible for project implementation, covering: technical skills, managerial skills, existence and quality of data systems, available technology and existing budgetary provision.

- Identify any barriers to M&E of the project such as a lack of political will, expertise or experience.

- What other organisations such as universities, private consultants or government agencies have the capacity to provide technical assistance and/or training?

(2) Establish the purpose and scope

- Why is M&E needed and how comprehensive should the system be?

- What are national requirements with regard to M&E?

- In particular, what should be the scope and degree of rigour of the evaluation of final project impact?

- Should the M&E process be participatory? In planning and implementing project M&E it is important to recognise the potential benefits of stakeholder participation. There can be benefits from this at all stages of the project cycle including monitoring and evaluation.

(3) Identify and agree with main stakeholders the project's outcomes and development objective(s)

- Setting a development goal and the project purpose or expected outcomes is essential in building a M&E system. In project design the specification of outputs, activities and inputs follows from this, and the expectation that achievement of outcomes will contribute to the higher level development goal(s) provides the justification for the project.

- In M&E design, indicators, baselines and targets (see 3.1.2, below), are similarly derived from the setting of goals and outcomes.

(4) Select key indicators and an evaluation framework

- Indicators are the qualitative or quantitative variables that measure project performance and achievements.

- Indicators should be developed for all levels of project logic (see 3.1.2), ie indicators are needed to monitor progress with respect to inputs, activities, outputs, outcomes and impact, to feedback on areas of success and where improvement is required.

Each indicator initially selected for inclusion in the M&E programme needs to be carefully scrutinised and tested before acceptance. Criteria against which indicators can be tested to ensure that they are suitable for inclusion are presented in 3.1.2, below.

3.1.2 Criteria for selection of indicators

Criteria	Description
Relevant	Indicators must be representative of the most important aspects of implementation and of the outcomes and impacts intended.
Clear	Indicators must be unambiguous and clearly defined in the project's context, and in a manner understood and agreed by all stakeholders. Any adjectives used to describe the qualities of an indicator need to be precisely defined. For example: − what is meant by '**improved service delivery**?' − an indicator may be '**the area of degraded land**' but what criteria will be used to classify such land? − for households what is included in '**farm income**' and what in '**non-farm income**?'
Specific	Indicators should measure specific changes, and be specific to a timeframe, location and target or other stakeholder group.
Measurable	There must be practical ways to measure the indicator, either in quantitative or qualitative terms, that are within the capability of the monitoring organisation. It must be possible to collect, process and analyse data in time and within budget.
Consistent	The values of the indicators should be reliable and comparable over time when collected using the same methods. This is more likely when indicators are measured in a standardised way and with sound sampling procedures.
Sensitive	Indicators should be sensitive to the expected changes. It is especially important that leading indicators are capable of revealing short-term movements. Indicators that require a long time series of values are practically useless for implementation decisions.
Attributable	Based on an established or probable relationship expected to cause the intended change. In moving from inputs and outputs to outcomes and impacts attribution must typically rely less on direct observation of cause and effect and more on statistical evidence of change and its probable cause.

Source: unit author

- The evaluation framework sets out the methods to be used to address the question of whether change observed through monitoring indicators can be attributed to the project interventions. The depth and rigour of impact evaluation required for a specific project given available resources needs to be carefully considered. A range of approaches are possible, but all require careful planning in conjunction with the selection of indicators if data omissions and weaknesses are to be avoided, and valid and reliable results produced. Assuming use of an experimental or quasi-experimental evaluation design, determination of which population units will receive the intervention and which will not, and establishing baseline information for all units are two reasons for detailed planning of impact evaluation in advance.

(5) Set baselines and plan data collection and analysis

- The baseline is the first measurement of an indicator, which sets the pre-project condition against which change can be tracked and evaluated. A single point in time or current value may not be representative and it may be better to use an average, for example, for the three previous years if such data are available. Baseline data must be gathered for the key indicators and this may require implementation of a baseline survey unless existing data sources are adequate.

- Subsequent data gathering and repeat surveys for the implementation period of the project and beyond should then be planned. Data collection may be continuous or periodic depending on the nature and purpose of an indicator. A wide range of data collection methods are applicable. The analytical approaches that will be required to match the needs of managers for information and of the evaluation framework must also be considered. In projects concerned with land use changes, use of modern technologies such as remote sensing should be considered.

- Ideally there should be sufficient capacity and resources to allow *ad hoc* special studies or investigations to be carried out to address specific problems or issues revealed by the on-going evaluation of monitoring data. These will be one-off, focused investigations of the issue at hand.

(6) Select results targets

- Following definition of outcomes, indicators and baselines, target setting is a key step in building a results-based approach. A target is a specification of the quantity, quality, timing and location to be realised for a key indicator by a given date. Starting from the baseline level for an indicator the desired improvement is defined taking account of planned resource provision and activities, to arrive at a performance target for that indicator. Most targets are set annually, but some could be set quarterly or for longer periods. Targets do not have to be single numerical values and sometimes a range of achievement may be more appropriate. Targets should also be kept under review and revised flexibly as necessary to take account of changing resource availability or other factors beyond the control of project management, but not to disguise poor project performance.

- It is important to be realistic, taking account of what is feasible and being sensitive to the political issues associated with targets that are publicly announced. As outcomes are typically longer term it is usually necessary to establish targets as short-term objectives on the path to achievement of an outcome. For project management, targets for 'leading indicators' are particularly useful. Interim targets over shorter time periods for which inputs can be better known or estimated, and set with reference to desired outcomes and impact, are also important for process-orientated interventions for which work plans and resource provision are not fully planned in detail in advance.

(7) Plan monitoring, data analysis, communication, and reporting

- 'Implementation monitoring' tracking the inputs, activities and outputs in annual or multiyear work plans, and 'results monitoring' tracking achievement of outcomes and impact, are both needed. The demands for information at each level of management need to be established, responsibilities allocated, and plans made for:

    – what data to be collected and when;

    – how data are collected and analysed;

    – who collects and analyses data;

    – who reports information, and in what form, to whom and when?

- An assessment of the flow of information and degree of detail needed by each level of management will help to clarify the indicators to be measured. The agency managing the project will require different types of information for its own internal management, compared to the reporting requirements of higher levels of government and development agencies.

(8) Plan the form and timing of critical reflection and interim evaluations

- For managers evaluation should be a continuously available mode of analysis utilised whenever evaluation results can be useful. Scheduling of events such as management team meetings can, however, be useful to ensure that analysis of progress and critical reflection takes place. Similarly, periodic project review workshops to facilitate analysis and discussion with project partners and other stakeholders may be necessary. Supervision requirements of governments and funding agencies may require periodic and formalised evaluations to take place. The data needs and analysis requirements for mid-term, terminal and *ex post* evaluations should be considered, and planning for these linked to the planning of monitoring and choice of evaluation framework. A timetable of formal evaluation reports should be set out.

- An indication also needs to be given at the design stage about feedback mechanisms for evaluation results beyond donor formalities such as mid-term and completion reviews. This is linked both to the development of accountability within the project, sector and higher levels of government, and the need to provide information to support decision-making. For example, flows of information may need to be timed to fit into national budget planning

activities, and should inform and influence identification and appraisal of any similar future projects or programmes.

(9) Plan for the necessary conditions and capacities

- It is necessary to plan the organisational structure for M&E including whether a M&E unit specific to the project is needed. Appropriate organisational structures for M&E should be discussed with partners and other stakeholders. Each partner's responsibilities and information requirements should be considered. Planning should cover: staffing levels and types, responsibilities and internal linkages, incentives and training needs, relationships with partners and stakeholders, horizontal and vertical lines of communication and authority, physical resource needs and budget.

- Monitoring and ongoing evaluation should normally be the responsibility of the project managers. Impact evaluation may often require the expertise and capacity of external specialists.

3.2 The components of a project monitoring and evaluation system

A sound project M&E system requires six main components which together help to ensure that M&E is relevant to the project, within the capacity of the project management organisation, and is used to good effect. Each is considered briefly below.

(1) Clear statements of measurable objectives for the project and its components.

Projects are designed to contribute to long-term sectoral development goals, but at the level of project purpose their outcomes should be quite specific and complete. Thus, for example, an irrigation project may be designed to further the sectoral goals of increased agricultural productivity, farm incomes and rural employment, but have a project purpose of providing an increased and more reliable irrigation supply through rehabilitation or modernisation of an irrigation system. Objectives at the level of project purpose should be specific to the project interventions, realistic in the timeframe for their implementation and measurable for evaluation.

(2) A structured set of indicators covering: inputs, process, outputs, outcomes, impact, and exogenous factors.

Indicators provide the qualitative and quantitative detail necessary to monitor and evaluate progress and achievements at all levels of the project hierarchy. The ability to define an indicator, and agree with partners and stakeholders a target and the timing for its achievement, is a demonstration that project objectives are clearly stated, and are understood and supported.

The logical framework approach provides an effective structure for planning M&E by defining a hierarchy of objectives for which indicators are required (3.2.1). Classifying project objectives according to their level highlights that management will need to develop systems to provide information (data collection systems) at all levels, from basic accounting through to statistics of project impact. Ultimately constructing good indicators will be an iterative process.

3.2.1 A logical structure for project monitoring and evaluation indicators

Logic	Indicators	Nature of the indicators	
Goal	Impact	Long-term statistical evidence	Exogenous indicators
Purpose	Outcomes	Social and economic surveys of project effects and outcomes. Plus leading indicators giving management advance warnings from beneficiary perceptions, responses to the project and other measures of performance.	
Outputs	Output	Management observation, records, and internal reporting.	
Activities	Process	Task management of processes. Financial accounts. Management records of progress. Procurement processes.	
Inputs	Input	Financial accounts. Management records of inventories and usage.	

Source: unit author

Input indicators are quantified and time-bound statements of the resources financed by the project, and are usually monitored by routine accounting and management records. They are mainly used by managers closest to implementation, and are consulted frequently (daily or weekly). They are often left out of discussions of project monitoring, though they are part of essential management information. An accounting system is needed to track expenditures and provide data on costs for analysis of the cost effectiveness and efficiency of project processes and the production of outputs.

Process indicators monitor the activities completed during implementation, and are often specified as milestones or completion of sub-contracted tasks, as set out in time-scaled work schedules. One of the best process indicators is often to closely monitor the project's procurement processes. Every output depends on the procurement of goods, works or services and the process has well defined steps that can be used to monitor progress by each package of activities.

Output indicators monitor the production of goods and delivery of services by the project. They are often evaluated and reported with the use of performance measures based on cost or operational ratios. For example: kilometres of all weather highway completed by a given date; percentage of farmers attending a crop demonstration site before fertiliser top-dressing; number of teachers trained in textbook use; cost per kilometre of road construction; crop yield per hectare; ratio of textbooks to pupils; time taken to process a credit application; number of demonstrations managed per extension worker; steps in the process of establishing water-users' associations.

The indicators for inputs, activities and outputs, and the systems used for data collection, recording and reporting are sometimes collectively referred to as the project physical and financial monitoring system, or management information system (MIS). The core of an M&E system and an essential part of good management practice, it can also be referred to as 'implementation monitoring'.

Outcome indicators are specific to a project's purpose and the logical chain of cause and effect that underlies its design. Often achievement of outcomes will depend at least in part on the actions of beneficiaries in responding to project outputs, and indicators will depend on data collected from beneficiaries, eg change in crop yields or cropping pattern, and investment by farmers in land management improvements. It will usually be important for project management to try to gain early indications of project performance in achieving outcomes through the use of leading indicators of outcomes. These may often be obtained by surveying beneficiaries' perceptions of project outputs and services, eg perceptions of improved reliability of irrigation supply, proportion of farmers who have tried a new variety of seed and intend to use it again; percentage of women satisfied with the maternity health care they receive. Such leading indicators have the twin advantages of consultation with primary stakeholders and advance warning of poor project performance.

Impact indicators usually refer to medium or long-term developmental change to which the project is expected to contribute. Dealing with the effects of project outcomes on beneficiaries, measures of change often involve statistics concerning economic or social welfare, collected either from existing regional or sectoral statistics or through relatively demanding surveys of beneficiaries. For example: (health) incidence of low birth weight, percentage of women who are moderately or severely anaemic; (education) continuation rates from primary to secondary education by sex, proportion of girls completing secondary education; (forestry) percentage increase in household income through sales of wood and non-wood products.

Exogenous indicators are those that cover factors outside the control of the project but which might affect its outcome, including risks (parameters identified during project design that might compromise project benefits) and the performance of the sector in which the project operates. Use of logical framework analysis for project design will guide the identification of exogenous indicators to match the key assumptions made about necessary external conditions at each level of the logical hierarchy. This need to monitor both the project and its wider environment calls for additional data collection capacity and places an additional burden on a project's M&E programme. This may be best met through use of existing data sources or assignment of the responsibility to another agency. Pragmatic judgment is required in the careful selection of indicators.

An example of a grain storage project in Myanmar demonstrates the importance of monitoring risk indicators. During project implementation, policy decisions about currency exchange rates and direct access by privately owned rice mills to overseas buyers adversely affected the profitability of private mills. Management would have been alerted to the deteriorating situation had these indicators of the enabling environment been carefully monitored. Instead, a narrow focus on input and process indicators missed the fundamental change in the assumptions behind the project.

The relative importance of indicators is likely to change during the implementation of a project, with more emphasis on input and process indicators at first, shifting to outputs and impact later on. The focus thus moves from implementation to results monitoring as implementation progresses.

(3) Data collection mechanisms capable of recording progress over time, including baselines and a means to compare progress and achievements against targets.

Within project M&E systems there will be a need to collect information of the baseline situation and for measurement of change over time for the indicators selected. It is vital to think about the sources of data, the reliability of that information and the costs and responsibilities.

Data sources for indicators can be primary or secondary. Primary data are collected directly by the project team or agency concerned, whilst secondary data have been collected by other organisations for purposes not specific to the project concerned.

Use of secondary rather than primary data has both advantages and disadvantages. On the positive side its use can be more cost-effective, and for many project situations it may simply be too costly to collect detailed primary data when this would require a large and costly household survey, or alternative data collection method of comparable cost. On the negative side, secondary data may have limitations if the purpose for which it was collected does not match well with the purpose intended for project M&E. The validity and reliability of the data must be considered, trying to identify any sources of bias and inaccuracy that may have arisen during its collection.

Potential problems with secondary data can arise in a number of ways. For example:

- incomplete coverage of the specific project area
- inability to disaggregate the data to match the boundaries of the project area or sub-areas
- inability to disaggregate the data to match the project affected population or sub-groups
- inconsistencies in data collection in surveys implemented in different areas, by different teams or in different time periods (eg interviewing of household members in one survey and only household heads in another, or use of crop cut measurements for yield in one survey and farmer estimates in another)
- inaccuracies arising from inappropriate choice of measurement and collection methods or inadequate training and supervision of data collection staff

Problems such as these may, when severe, invalidate any comparison intended to reveal and measure change in project outcomes and impact. To address such issues M&E plans should explain and justify the proposed approach and ensure consistency in methods. The complexity of the statistics and the problems of attributing causality may mean that it is often more cost effective and appropriate to use leading indicators such as delivery of services and beneficiary response as proxies, and at least as a complementary if not sole source of evidence, rather than to attempt to evaluate project impact using only secondary data sources.

Overall, a data collection system used for project M&E should be assessed in terms of **reliability**, **validity**, and **timeliness**. Reliability is the extent to which the data collection system is stable and consistent across time and space. In other words, measurement of the indicators is conducted in the same way on each occasion. Validity is achieved when indicators measure as directly and accurately as possible the changes of interest and relevance to project management. Timeliness consists of three elements: **regularity** in the frequency of data collection; **currency** (how recently data have been collected and how this matches important seasonal events or implementation 'milestones'); and **availability** (provision of information at the right time to support management decisions).

Data collection will incur costs of staff time and other resources, whilst excessive collection of unnecessary data will slow down processes of analysis and reporting, and may lead to a failure to communicate clear messages. Thus it is important to collect only the data that will be used effectively to improve management and decision-making.

It is important to think about the following aspects when planning data collection.

- **What** – the data to be collected, in what form, with what degree of aggregation or consolidation, and for what purpose.
- **When** – the frequency of data collection and reporting.
- **Who** – the responsible persons, their responsibilities and capacities.
- **How** - methods and procedures for data collection, checking, validation and storage, and for analysis and reporting.
- **Where** – locations for data collection and processing, and the destinations for reported information.

Project monitoring and evaluation will often make use of a wide range of methods for gathering, analysing, storing and presenting data. There is no single answer as to which method is best, as this will depend on an organisation's resource availability, access to the sources of data, purpose for the data, and time constraints. Often methods for primary data collection will need to be combined. Structured and formal methods for data collection will tend to be more accurate and reliable, but also more costly and time consuming. For data that are needed frequently and on a routine basis to inform management decision-making, it may be preferable to adopt less structured and less costly collection strategies. Rigorous approaches to impact evaluation that address the problem of attribution will generally require a more formal and structured approach, and hence may need to be applied selectively.

Before decisions are made on the data collection and management strategies to employ it is important to consult with the users of the information. What are their needs and priorities for the information they require to improve their decision-making and the overall process of project implementation? What are their perspectives on the trade-offs that may need to be made?

Data collection plans should not be permanently fixed from the commencement of the project. As project management responds to changing circumstances and adopts an adaptive approach to implementation, so will information needs change. There needs to be sufficient adaptability and flexibility in the M&E system to identify new indicators, data sources, collection methods and ways of reporting as required.

Indicators for inputs, processes and outputs will generally come from project management records originating from field sites. The quality of record keeping in the field sets the standard for all other use of data and merits careful planning and attention. It is important that the data collection is systematic and that data are collected on time for all specified periods. The seasonal nature of rural economic activities imposes particular requirements and constraints upon this. M&E designers should together with managers determine what information will be useful to managers at field, intermediate and senior levels, and how and why it will be useful. Together they should also assess the capacity of existing record-keeping and reporting procedures to generate the information that will be needed.

To measure outcomes and impact will typically require the collection of data from formal sample surveys, used in combination where appropriate with methods of participatory rural appraisal (PRA) or rapid rural appraisal (RRA). There must be adequate capacity to do this for baseline data collection and repeat surveys that will compile a continuous or periodic time series of data for key indicators. Where possible, it may be better to add project-specific regular surveys on to existing national or area surveys than to create a new data collection facility. Participatory methods can engage local people as participants within the monitoring and evaluation, and hence project management, process.

Routine monitoring and evaluation, particularly of leading indicators of outcomes, may reveal problems during implementation. An example would be a disappointing response rate among primary beneficiaries such as a low rate of credit uptake to finance farm improvements. Such situations may call for *ad hoc* diagnostic studies to determine the cause of the problem and identify possible solutions. Such studies may call for staff research skills and training beyond those needed for regular collection of data, and thus may need to involve managers themselves or be subcontracted to a university or consultants.

Whatever data collection methods are selected the plans for the monitoring and evaluation of a project should explain and justify the proposed approach and ensure consistency in methods.

Key principles for the most relevant and commonly used data collection methods for project monitoring and evaluation are briefly reviewed below.

Bio-physical measurements

Measurements of physical change over time, for example, crop yield, soil erosion, watertable depth and water pollution. Such measures may require recording instruments installed on-site, or brought in at the required frequency, operated by project staff or external experts. Selected methods need to be adapted to local conditions, skills and resources, and it may be necessary to seek a compromise between local capacities and technological appropriateness and the achievable level of scientific accuracy. Use of remote sensing techniques may offer an alternative to, or may supplement, on-site measurements. Whatever methods are adopted, the data need to be recorded in standard forms to facilitate easy and consistent analysis, and the making of comparisons over time and space.

Sampling methods

For both bio-physical and socioeconomic indicators, sampling will usually be needed given resource constraints and the size of the 'system' or 'population' to be monitored. The following will be needed to achieve a representative sample and valid and reliable results for the project area, system or target population.

- Clarification and accurate listing of the sampling frame: a listing of the sampling units that make up the population to be studied. For example, all farming households cultivating land within the project area, or sites for monitoring watertable depth.

- Selection of an appropriate sample size: based on available budget and resources, the number of sub-groups analysed, the time available, the variation within the population for the key variable(s) to be monitored, and the desired level of accuracy and statistical confidence.

- Selection of the sampling method. A random sample is often chosen for quantitative data and particularly for socioeconomic indicators. Non-random sampling is more often associated with qualitative data collection and analysis, and involves a focused and deliberate sampling from the population, creating the risk of sample selection bias. Purposive sampling might be used for some bio-physical measurements so as to address particular aspects of project performance, or to ensure coverage of key locations or other sources of concern.

- Stratification of a population before selection of a random sample from each stratum can help to improve the statistical efficiency of sampling, and hence the extent to which the selected sample is representative of the population.

- In practice, because of the difficulty of compiling a comprehensive sampling frame and/or to improve survey logistics by concentrating the points from which data is collected, it is common to use a multi-stage sample procedure. In contrast to stratification this reduces sampling efficiency and thus the potential accuracy of the sample estimates obtained. It may be necessary to compensate for this effect by increasing the sample size.

When an accurate and comprehensive sampling frame is available, selection of a small random sample is a straightforward task. However, in many other situations an experienced sampling specialist may be needed to determine the appropriate sampling frame, sample size and sample selection strategy. This is most likely to be the case for socioeconomic data and for indicators of project component outcomes and project impacts; in other words for 'results monitoring' and for project impact evaluation.

Formal surveys

A typical formal survey involves taking a range of measurements or observations from a relatively large sample. Surveys are commonly used at the start and end of a project, to gather baseline information and compare outcomes to targets. A survey can also be carried out as part of a mid-term review, to monitor progress and adapt project implementation as needed.

A standardised form may be used for recording physical measurements or estimates based on observation whilst, for socioeconomic data, the survey instrument will usually be a structured questionnaire used to record the data provided by selected respondents who are individually interviewed.

Such socioeconomic surveys are often an important part of 'results monitoring' as they can achieve focused, valid and reliable data collection on topics such as the composition of the target population, attitudes towards the project, and perceptions of change in key variables such as production, incomes, vulnerability, or empowerment. However, it will also often be important to supplement the quantitative results of such surveys with in-depth qualitative information that can be used to help explain the changes that have been recorded and to establish the causes of these changes.

Formal surveys can have the disadvantages that they are highly extractive (rather than participatory), costly, time consuming to implement and process, and with a tendency to collect too much data.

Semi-structured interviews

This data collection technique is commonly used in informal surveys and typically involves a relatively small and non-random sample. It is used to gain information from an individual or a small group, using a series of broad questions to guide the conversations, but allowing for new questions to arise as a result of the discussion. Such interviews can be used to develop in-depth understanding of context, processes and issues, assess unintended impacts, and gather opinions about the relevance and quality of project services. Qualitative interviewing of this type can provide understanding of the perspectives, attitudes, and behaviour patterns of the target population. It is thus often appropriate for gathering initial data for leading indicators of project outcomes and impact. It can also be used to generate hypotheses and propositions that are then tested on a wider population using a structured survey. Also, it is flexible enough to allow the interviewer to pursue unanticipated lines of inquiry and to probe into issues in depth. Finally, there is a greater likelihood of getting input from senior officials or other key informants who may hold sensitive information with this method.

An M&E specialist should normally select the sample to be interviewed according to the purpose of the investigation. The interview checklist should be pre-tested before use and enumerators who conduct the interviews will need to be well trained and experienced. Typically they will need to have good knowledge of the local area and population so as to be able to interact naturally and effectively with the respondents. It is desirable for two trained team members to conduct each interview, the interviewer and an observer who will record the information provided by the respondent.

As this method of data collection is less structured and open-ended it can be difficult and time-consuming to analyse what is collected and to synthesise clear results.

Key informant interviews

Key informants can be an important source of information for project M&E. Interviews may be face-to-face or by telephone, and questioning is generally semi-structured and open-ended but can make use of structured close-ended questionnaires.

Key informants will be a small and purposively selected sample, chosen because of their particular knowledge and position. The selection of informants should adequately represent possibly diverse viewpoints and concerns, and should be sensitive to gender or other sources of bias. Triangulation of information from different sources is important as a means for validation of information commonly held to be true. Village chiefs, teachers, local officials, and higher-level officials are examples of key informants relevant to rural projects. However, some informants may have agendas that are hidden and views of less powerful groups may be neglected.

Focus group interviews

Discussion with selected groups that are familiar with pertinent issues is another technique that can be used to explore issues and processes, and to clarify details and gather opinions, before designing a formal and structured survey. Focus groups are particularly useful for assessing opinions of change and the causes of change, and the quality of project services, and for identifying areas that need improvement. They can also help to identify hierarchical influences within the community if the group is heterogeneous. The main limitations of this method are that it can be expensive and time consuming, and care must be taken in seeking to generalise the findings for the project population or area as a whole.

Community meetings

Community meetings take the form of public meetings with a larger group. When used for the purpose of gathering project M&E information, they should be based on an interview guide or checklist and facilitated by an interdisciplinary team rather than a single interviewer. Attendance at the meeting should be representative of the population of interest. Meetings should be held at a time of the day and place which is convenient for the community and does not clash with work or other social commitments. One of the most difficult tasks for facilitators is to restrain élite members of the community from dominating the meeting and monopolising the discussion. Facilitators should

encourage different people to participate, and opinions on certain subtopics should be verified by polling the attendees when this is possible.

Rapid Rural Appraisal (RRA)

RRA can be described as a systematic but semi-structured research activity carried out by a multidisciplinary team over a relatively short period of time. It can involve a range of informal data collection techniques such as semi-structured interviews, transect walks, mapping, and wealth and matrix ranking. It can be used as part of the project M&E system, either at appraisal to gather baseline information and help improve project design, or over the course of the project to assess and evaluate progress. However, data collected are prone to bias in interpretation and are not statistically representative.

Participatory Rural Appraisal (PRA)

PRA uses a similar array of data collection methods to RRA but places greater emphasis on the participation of local people in identifying the issues to be investigated and in the collection and analysis of data. Such approaches should be integral to participatory approaches to project management and implementation.

Case study

In the context of project M&E, a case study documents the sequence of events over time related to a person, household, location, or organisation, and facilitates in-depth understanding of the processes and human and other factors behind observed changes. The need for a case study can arise, for example, from a more general formal survey in which a particular issue emerges as needing more in-depth investigation.

The M&E specialist should specify the purpose and information needs of the case study, then decide how individuals, households, or organisations will be selected for the study, and how data will be obtained. The case study findings can draw on a variety of evidence from documents, interviews, and direct observations. Questionnaires or checklists may be used to guide the information collection. Discussions and observations are typically repeated over time to assess processes of change and achieve an up-to-date picture as conditions change. Good case studies are difficult to do and can require high level and specialised research skills. They are also time-consuming and findings are subject to the limitation that they may not be generalisable for the whole population or project area.

Direct observation

This method involves structured observation of an activity, behaviour, relationship, phenomenon, network, or process in the field. It can be used to understand the context in which M&E data are collected, and help explain M&E results. Phenomena and processes can be studied in their natural setting and a holistic understanding gained. For example, regular observation of farmer meetings could reveal how priorities are set and decisions made, whilst observation in the field could show how labour is utilised.

Such activity should be well planned by project management and M&E staff, who should agree a clear conceptual framework, as well as guidelines for what needs to be observed and the information required. It is then necessary to choose and train the appropriate group of observers who may be community members, project staff or knowledgeable outsiders. Information can be recorded in logs or diaries, discussed with stakeholders and used for M&E analysis.

In general, direct observation should always be used in conjunction with other M&E methods as the quality and usefulness of data is highly dependent on the observer's observational skills and findings can be open to interpretation.

Written documents analysis and review of programme records

This method involves reviewing project documents and records such as administrative databases, training materials, correspondence and routine progress reports. It can be very useful in identifying issues to investigate further and provide evidence of action, change, and impact, to support respondents' perceptions. The M&E specialist should prioritise those project records that are most likely to provide useful information in relation to key indicators and to the phases of implementation and results monitoring. The quality of data stored in the project records needs to be assessed, and as far as possible its format and storage managed to facilitate review and analysis in a cost-effective and efficient manner.

> **(4) Where applicable, building on data collection with an evaluation framework and methodology capable of establishing causation (attribution).**

As part of the growing emphasis on impacts and results, more attention than ever is now being given to rigorous impact evaluations that seek to discover how effective particular types of intervention or policy are at achieving their goals – for example, the effectiveness of free school meals in raising school attendance, or the impact of microfinance programmes on rural poverty rates. Driven by a desire for a better understanding of what does and what does not work in development, a small number of projects are even intended from the outset to serve as experiments to test the effectiveness of a particular development tool. Many of these involve **randomised control trials (RCTs)**, in which project beneficiaries are randomly selected so that the outcomes for this group can be subsequently compared with those for a control group that did not benefit from the project, much in the way medical treatments are tested.

There are many different ways of trying to analyse the impact of an intervention. The choice will depend upon whether the need for such an analysis was fully recognised at the project design stage (so as to allow RCT, for example), upon the type of intervention being investigated, and the sorts of questions that need answering (Rogers 2009). We do not have the scope to examine the different techniques in this module, however, you should be aware that, whilst RCT is the most publicised one, and some would argue, the most rigorous technique, it is not the only one.

As a continuously available mode of analysis for project managers ongoing evaluation can be used to address the following key questions for rural development projects.

- Is the response of the targeted populations as anticipated and satisfactory?

- What are the effects of the project on agricultural and other rural products?

- Are there any unanticipated effects, positive or negative, for the project or in relation to its wider environment?

- Can the causes of all observed changes be discerned and established with evidence?

- Does the logic of the intervention model of the project remain valid (ie is it the right design)?

- Are any *ad hoc* special or diagnostic studies needed to help answer any of these questions?

Such ongoing evaluation feeds into the periodic and more formalised evaluations also typically required by governments and donors. For these the focus is whether changes have occurred and what has been the cause. Thus the evaluation tries to determine what portion of the observed and monitored impacts the project caused, and what might have been the result of other events or conditions. The aim is thus attribution of documented change. This type of evaluation is challenging, especially as it is required after the end of the project implementation period, when outcomes and impact will have had time to fully emerge. The longer the time between the project's implementation and the attempt to attribute change, the more likely it is that other factors will also have had a significant influence. While it may be possible to attribute outputs and some outcomes to specific interventions, longer-term impacts pose greater attribution challenges.

The evaluation framework lays out the analytical approach that will be used to address this problem, usually by testing observed change against a counterfactual (ie the situation that would have happened had the project not taken place). Identifying the counterfactual is difficult but there are strategies for doing so which are the core of evaluation design.

To determine the counterfactual, it is necessary to net out the effect of the interventions from other factors, through the use of **control** or **comparison** groups (those who do not participate in a program or receive benefits) which are subsequently compared with the treatment group (individuals who do receive the intervention). Control groups (used in RCT) are selected randomly from the same population as the programme or project participants, whereas a comparison group is simply another group that does not receive the programme under investigation.

Because no method is perfect and the project design often constrains choices, the evaluator must carefully explore the methodological options and their combinations in designing the study, with the aim of producing the most robust results possible. Methods to establish and estimate the counterfactual fall into two broad categories: experimental design (randomised), and quasi-experimental designs (non-randomised).

Experimental designs (randomisation)

These are considered the most robust of the evaluation methodologies and require a randomised selection of the target population as part of the project design. A random selection into treatment and control groups is made within a defined area and population. In this case there should then be no difference between the two groups besides the fact that the treatment group have access to or are influenced by the project or programme. This method is unlikely to be appropriate for most rural development projects as it will not be possible nor desirable to divide the potential beneficiary population into treatment and control groups. An additional criticism of randomised control trials is that an excessive focus on obtaining empirical evidence about whether something worked neglects mechanisms, processes and context, all of which help to explain 'why' it worked and give insights into whether or not it would work in a different environment or context (Deaton 2010).

Non-experimental or quasi-experimental designs

These techniques generate comparison groups that resemble the treatment group, at least in observed characteristics, through use of econometric methods. Their main benefits are that they can draw on existing data sources and can be performed after a project has been implemented. Their principal disadvantages are that the reliability of the results is often reduced as the methodology is less robust statistically and the methods required can be statistically complex.

Qualitative methods

Qualitative and participatory techniques can also be used to assess impact. These techniques often provide critical insights into beneficiaries' perspectives, the value of programs to beneficiaries, the processes that may have affected outcomes and a deeper interpretation of results observed using quantitative analysis. Because measuring the counterfactual is at the core of impact analysis techniques, qualitative designs have generally been used in conjunction with other evaluation techniques.

The benefits of qualitative assessments are that they are flexible, can be specifically tailored to the needs of the evaluation, can be carried out quickly, and can greatly enhance the findings of an impact evaluation through providing a better understanding of stakeholders' perceptions and priorities, and of the conditions and processes that may have affected program impact. Among the main drawbacks are the subjectivity involved in data collection, the lack of a comparison group, and the lack of statistical robustness given typically small sample sizes. The validity and reliability of qualitative data are also highly dependent on the methodological skill, sensitivity, and training of the evaluator.

Integrating quantitative and qualitative methods

Integrating quantitative and qualitative evaluations can often be the best approach to meet a project's information needs. In combining the two approaches, qualitative methods can be used to inform the key impact evaluation questions, improve the questionnaire or the stratification of the quantitative sample, and analyse the social,

economic, and political context within which a project takes place. Quantitative methods can be used to inform qualitative data collection strategies, to inform on the extent to which the results observed in the qualitative work can be generalised to a larger population and statistical analysis can be used to control for household characteristics and the socioeconomic conditions of different study areas, thereby eliminating alternative explanations of the observed outcomes.

Outcome mapping and pathway analysis can be complementary to a results-based approach, contributing the means to understand stakeholder engagement, participation and learning processes, and whether and how local capacity, organisations and institutions have been strengthened and empowered.

Recognising firstly that development goals may equally be about improvements in governance, institutions, local capacity and empowerment, as changes in productivity, incomes and distribution, and secondly that attribution of causation *per se* is almost never truly possible, evaluators are increasingly applying a wider range of standards or criteria in their work. The formal methods briefly described above aim to determine 'probabilistic causation' (ie correlation) through quantitative analysis, but increasingly the assertion of probable cause is also supported by qualitative evidence from case studies or other informal methods. Increasingly mixed-methods are adopted to reduce uncertainty and to generate 'reasonable confidence' as a substitute for reliance on statistical significance alone. Loss in statistical rigour being accepted as outweighed by gain in understanding of how projects work, which parts work best and why they worked in a given context. The emphasis in contemporary evaluation is thus at least as much on understanding and improving as on measuring and proving.

(5) Clear mechanisms for reporting and use of M&E results in decision-making.

There are a range of possible users for the results of monitoring and evaluation of development projects. These include primary stakeholders, the project management organisation, government agencies, other implementing partners, and donors. Clear feedback mechanisms are important if the purposes of M&E are to be achieved. Providing the right information in the right place and right form to be used by the right person in decision-making is the ultimate aim.

A good flow of information is also closely linked to the development of accountability within the project, sector, government, and donor. In many countries, information on projects and programmes is poor and difficult to access, and the mechanisms for feedback are weak or nonexistent. The highest payoffs to evaluation arise at the policy and programme level, but project-level evaluation offers an easier and less sensitive starting point in many instances. Information from monitoring and evaluation can be used to demonstrate accountability and to promote knowledge transfers and adaptive learning in government agencies and other organisations.

The uses of the information and the feedback mechanisms need to be structured and scheduled according to the needs of managers and other partners and stakeholders. For example:

- Project management will need to monitor expenditure and progress against schedules, weekly and at least monthly.

- Outputs are unlikely to be measurable at less than three-monthly intervals, and some may need much longer.

- Consultations with beneficiaries, or surveys of their satisfaction with project services, should be timed to supply information to use in planning project activities.

- The time period for reporting may vary with the level of management: for example, monthly at district level, quarterly at regional or state level.

- Some flows of information need to be timed to fit into national budget planning activities.

- Annual funding may depend on the results from previous work.

- Periodic mid-term and terminal reviews provide milestones by which information has to be ready.

- Processes of project identification, preparation and appraisal should show evidence of having made use of the lessons of evaluations of similar projects or programmes.

From the start of the project, a communication strategy needs to be developed that will address the following questions:

- Who will receive what information?

- In what format?

- When?

- Who will prepare the information?

- Who will deliver the information?

Information should be reported concisely, be relevant to the user and be timed to improve key decision-making events. Four means of communication may be used and will reinforce each other: detailed written information (reports), written executive summaries, and oral and visual presentations.

(6) Sustainable organisational arrangements for data collection, management, analysis and reporting.

In terms of organisational arrangements there is no single correct way to build a project M&E system. Projects vary in their characteristics and requirements, and countries and organisations are at different stages of development with respect to good public management practices in general, and M&E in particular. It is also important to recognise that M&E systems are continuous works in progress that must be flexible and adaptable to changing needs and circumstances.

Logical framework analysis indicates that project management will need to develop systems to provide information at all levels, from basic operational inventories and accounting through to generation of statistics about outcomes and impact. Building on

the concept of a structured set of indicators, 3.2.2 shows the typical nature and location of responsibility for M&E components at each level.

The right hand column of 3.2.2 should be regarded only as an illustrative guide to be adapted as necessary. Certainly inputs, activities and their outputs are within the control of project management and can be monitored and evaluated through internal record-keeping and progress reporting, analysis of this information, and management review. Generally, management will want to integrate monitoring with other systems such as financial accounting and computerised project management, and development of such comprehensive management information systems should be supported in the project design.

In contrast, the achievement of project outcomes normally depends on how project beneficiaries respond to the goods and services delivered by the project. Compiling evidence for leading indicators of their response and the benefits they derive requires consultation, research and data collection skills that may be beyond the capacity of the project management organisation, but if so, must be carried out in close partnership with it. Then because outcome and impact evaluation will only be measurable towards the end of implementation, or in later years, and because it also requires higher levels of research and analytical skills and objectivity, it may often be better done by a separate agency, independent from implementation.

3.2.2 Organisation of project monitoring and evaluation

Objectives	Indicators	M&E components	Responsibility for M&E
Goal	Impact	Long term statistical evidence of project impact Exogenous indicators for risk factors and unanticipated wider environmental and social impacts	National or sectoral agencies and/or independent specialists
Purpose	Outcomes	Socioeconomic surveys M&E of leading indicators Diagnostic studies	Project management and/or independent specialists
Outputs	Output	MIS for physical and financial monitoring	Project staff
Activities	Process		
Inputs	Input		

Source: unit author

However, it must be emphasised that monitoring and evaluation is too important to be left only to independent specialists. Subject to the distinctions outlined above, it should generally be an integral part of all project and programme planners' and managers' duties. Monitoring is a tool of good management and the responsible unit should ideally be located within or close to project management. Thus, the resources, training and technical assistance for the unit should be specified in the project implementation plan. Where independent external expertise is needed, it should be procured through partnership in the case of national or sectoral agencies, or contracted on a consultancy basis supervised by project management in the case of other agencies.

An administrative unit for project level M&E that is separate from project management may only be justified in agencies with a weak management history and very limited capacity, or for projects with multiple components implemented by multiple agencies. In the latter case, the M&E unit should still be well integrated into the overall co-ordinating arrangements for the project or programme.

Ultimately, the aim should be that project level M&E is well integrated with the planning and management of all policies and interventions by the relevant government departments. Ideally, the use of information generated by project level M&E should become 'institutionalised', so that there is no disconnection between project implementation and the overall approaches and strategy of public sector management. This may require capacity building within the government agencies concerned.

3.3   Participatory project monitoring and evaluation

It has been recognised that there is an increased need to engage in direct dialogue with stakeholders involved in development projects. There has been a significant increase in use of participatory appraisal and planning approaches, and in establishment of participatory processes for management of infrastructure and natural resources. One critical dimension of this engagement is to involve stakeholders in the monitoring and evaluation of project activities, outputs and outcomes.

Participatory monitoring and evaluation is a process of collaborative problem-solving through the generation and use of knowledge, and through corrective action based on shared decision-making involving all stakeholders. Its key principles are:

- local people are active participants – not just sources of information

- stakeholders evaluate, outsiders facilitate

- a focus on building stakeholder capacity for analysis and problem-solving

- a process that builds commitment to implementing any recommended corrective actions

Participation in M&E is often incorrectly understood to mean that local people simply have the role of collecting information, and that outsiders still determine the selection of indicators, analytical frameworks and reporting methods. In contrast, participatory monitoring and evaluation should be considered a different process to conventional M&E. In this process project stakeholders are fully involved in designing the monitoring system and in collecting, analysing, compiling and sharing the information.

It can also be the case that participatory monitoring and evaluation is viewed as using only qualitative methods and that it produces unreliable data. In contrast, true participation requires that project stakeholders are involved in negotiating what needs to be assessed and measured, and with what level of rigor, validity and reliability, and then in selection of the appropriate methods. As with conventional, or non-participatory, M&E, analytical rigor and the best quality of information will often be achieved through the use of a combination of data collection and analytical methods.

3.4   Learning and M&E systems

'Learning' and 'lesson learning' have become common parlance in development. So why is this and what exactly do we mean by 'learning'?

> ✍ For a moment, think about what 'learning' means to you (you can reflect on how you have learnt during this module).

Learning has been described as

'a continuous dynamic process of investigation where the key elements are experience, knowledge, access and relevance. It requires a culture of inquiry and investigation, rather than one of response and reporting'

Source: UNDP (2002) p. 77.

Models of experiential learning typically comprise four dimensions of learning: having an experience; reflecting on that experience; conceptualising from the experience; and then testing out new ideas/concepts which lead to a new experience. Focusing upon these four elements of experiential learning has been helpful in many arenas in facilitating processes that help individuals, organisations or communities to respond to change and improve performance (Woodhill 2006).

Different agencies and organisations apply different theories in practice. Approaches such as 'learning by doing', 'reflective practice' and 'lesson learning' have been adopted by various agencies. 3.4.1, below, provides some insight from one organisation – CARE – about its approach to 'reflective practice'.

3.4.1 CARE and reflective practice

'Self-reflection is much like the process of orienteering, where an individual uses both map and compass to navigate through unfamiliar territory. The ultimate goal is to stay on course and find your destination. Reflective practice is the art of continual self-reflection, which enables us to routinely assess whether we are on course to achieve our goals. It is a practice that we often do in our personal lives (for example, as one plots her/his course of education leading to a career path) but less often in our professions'.

'Perhaps the most important part … is the reflection on collected data. Having asked a question that begs an answer, and designed a plan for collecting that information, staff need to reflect on their experiences and ask such questions as:

−   What were the anticipated effects?

−   Were there some unanticipated effects?

−   What have we learned from this?

−   What might we have to relearn or unlearn in our work?

−   What are our next steps?

−   Should we stop doing this because it doesn't work as well as we had planned?

−   Continue doing this because it is getting results we find desirable?

−   Start doing something else that may be more likely to succeed?'

Source: Caldwell (2002) p. 109.

Many manuals and guidelines for project planning and for monitoring and evaluation focus upon identifying 'best' practice and the project cycle is predicate on making effective use of the lessons learned as outputs from projects and programmes. However, it can be argued that in general the lessons learnt are of poor quality, and that more attention needs to be placed upon understanding the knowledge and learning processes so as to maximise the opportunity for, and the quality of, new knowledge. 3.4.2 explores this idea by setting out common weaknesses of lessons learnt from evaluation of development projects and programmes.

3.4.2 Weakness of 'lessons learned'

The lesson learned does not have a generalised principle that can be applied in other situations. It is simply a description of an observation, or a recommendation that lacks justification.

The lesson has not been related to the assumption or hypotheses on which the intervention has been based and so lacks a meaningful context

The lesson is an untested or inadequately justified assumption or hypothesis about what might happen if something is done differently. In other words it would be foolish to rely on the lesson without it first being tested

The lesson is either too general or too specific for it to be useful.

The lesson has not been related to existing knowledge, hence it is unclear whether it represents a repetition of existing understanding or offers a fresh insight.

Source: Woodhill (2006) p. 4.

> ✍ Think about your own experience, and organisations in which you have learnt successfully. What were the main characteristics of the organisation's culture that facilitated learning?

To promote improved learning we can identify some of the key characteristics that an organisation should have (IFAD 2002).

- Individuals know that their ideas and suggestions are valued.

- Mistakes and failures are considered important by everyone and are not regarded as shameful.

- All the key groups involved in project and programme implementation communicate openly and regularly.

- Project implementers, including primary stakeholders, regularly and informally discuss project progress, relationships and how to improve actions.

- Managers listen carefully to others and consciously seek solutions together.

- During regular meetings and workshops, time is set aside for discussing mistakes and learning lessons.

- The question, 'why is this happening' appears often in discussions.

Small changes can be carried out to improve a learning environment as well as more fundamental changes. For example, appropriate management of a team is vital to creating the right incentives for learning. There are always opportunities for management to improve their skills, but it is fundamental that they have the appropriate attitude to M&E and learning, ie that M&E is important and a learning experience. It is also important that managers have a willingness to create an appropriate learning environment, with good team dynamics and openness to feedback and dialogue.

It is fundamental to be able to admit and learn from mistakes. Although this is common wisdom, many projects are keen to show that they are successful (particularly so that they can secure further funding) and therefore refrain from admitting problems. Mistakes can provide a useful learning opportunity, asking questions of – why did this occur as it did? How could it be done differently next time? Often this requires openness from a funding agency towards learning from the process as well.

Critical to learning is putting the right incentives in place for individuals and groups to learn. Often a lot of learning takes place informally, and it is important to recognise and build on that. Critical to this is the notion that M&E and learning are taking place for the benefit of the project's internal learning and final outcome and impact rather than purely for the funding agency. This brings us back to the importance of a management perspective for monitoring and evaluation, seeing M&E as an essential part of good management and not just a formality for the purposes of reporting to a higher level of authority.

Section Summary

Understanding and designing project monitoring and evaluation systems can be informed by the concepts and method of logical framework analysis. This provides the means to structure indicators and the organisation of all monitoring and evaluation activities. The steps involved in planning and implementation of a project M&E system are relatively straightforward, but the challenges arise in determination of the right balance of approaches and methods to be used. The approaches for data collection, evaluation and reporting that are selected must be well tailored to a project's characteristics and to local conditions and capacities. It is important to understand monitoring and evaluation as an essential part of good management, and one that requires acceptance of the notion of learning and of the creation of a learning environment.

Section 3 Self Assessment Questions

Question 6

Input indicators are:

    (a) quantified and time-bound statements of resources employed

    (b) assessments of activities carried out

    (c) always included within management information

    (d) not necessary to be monitored

Question 7

Baseline information should be collected:

    (a) only when it is felt that there is a need for it

    (b) in order to be able to measure the change from before to after an intervention

    (c) when indicators are being collected for evaluation purposes

    (d) at the end of a project

Question 8

List seven criteria for the selection of indicators for use in project monitoring and evaluation.

Question 9

Allocate the following phrases to complete the table below.

(a) Diagnostic studies

(b) Exogenous indicators for risk factors and unanticipated wider environmental and social impacts

(c) Long-term statistical evidence of project impact

(d) M&E of leading indicators

(e) MIS for physical and financial monitoring

(f) National or sectoral agencies and /or independent specialists

(g) Project management and/or independent specialists

(h) Project staff

(i) Socioeconomic surveys

Organisation of project monitoring and evaluation

Objectives	Indicators	M&E components	Responsibility for M&E
Goal	**Impact**		
Purpose	**Outcomes**		
Outputs	**Output**		
Activities	**Process**		
Inputs	**Input**		

Question 10

True or false?

(a) Results-based monitoring and evaluation has emerged in response to the increasing need for greater accountability, transparency, efficiency and evidence of outcomes and impacts.

(b) Results-based monitoring and evaluation differs from previous approaches in that there is greater emphasis on inputs and activities rather than outcomes and impacts.

(c) Results-based M&E is particularly relevant to policy and programme implementation and to projects that are process oriented.

Question 11

What are the four dimensions of experiential learning?

UNIT SUMMARY

- This unit has introduced you to project monitoring and evaluation. This is a large subject in its own right and we have not been able to cover all of its different facets in detail.

- We have seen that monitoring and evaluation are distinct though related activities. Monitoring is a regular, ongoing activity which provides information for managers so that they can ensure that project implementation is on-track. Evaluation asks whether the project is achieving its aims, how well the project is being, or has been, implemented and whether there are any unforeseen effects of the project. The results of evaluation may feed back into the design and implementation of the evaluated project and/or the design of future projects. Evaluation may be ongoing in which case it is likely to be carried out by project management, terminal or *ex post*.

- The Logframe provides a useful conceptual framework for the design of M&E. It makes clear the project logic or hypothesis: if certain conditions hold, a particular set of inputs will produce outputs, which in turn lead to direct effects, which can produce wider poverty reducing impact. The Logframe provides a basis for definition of indicators of achievement at each of these levels.

- Results-based monitoring is responding to a call for greater transparency, accountability and efficiency in project management. It focuses M&E on outcomes and objectives rather than inputs and outputs. It can be applied at the project, programme and policy levels, but implementation monitoring should not be neglected for projects.

- Learning is paramount to ensuring that M&E is effective and of maximum benefit. There are a number of different tools which can facilitate greater learning within the M&E process, and it is crucial to create the right culture and learning environment for learning to take place.

UNIT SELF ASSESSMENT QUESTIONS

Question 1

What are four main key reasons for conducting project M&E?

Question 2

In your own words, state the difference between 'monitoring' and evaluation'.

Question 3

From what you have learnt from the unit, what are the key 'tips' that you would share with somebody just drawing up a plan for project monitoring and evaluation.

KEY TERMS AND CONCEPTS

counterfactual	the situation that would have existed over time without the changes introduced by the intervention
evaluation	the periodic assessment of the design, implementation, outcomes and impact of a development intervention; it should assess the relevance and achievement of objectives, implementation performance in terms of effectiveness and efficiency, and the nature, distribution and sustainability of impacts
implementation monitoring	monitoring of the operation and performance of a project, ie monitoring of inputs, activities, and outputs as defined in logical framework analysis
monitoring	the continuous collection of data on specified indicators to assess for a development intervention (project, programme or policy), its implementation in relation to activity schedules and expenditure of allocated funds, and its progress and achievements in relation to its objectives
participatory rural appraisal	an approach that uses a similar array of data collection methods to RRA but places greater emphasis on the participation of local people in identifying the issues to be investigated and in the collection and analysis of data
pathway analysis	use of monitoring data to evaluate the processes or pathways that facilitate or impede a planned outcome or impact; the focus is upon evaluating the process of moving from one level to another in the logical framework analysis of the project
rapid rural appraisal	a systematic but semi-structured research activity carried out by a multidisciplinary team over a relatively short period of time; it can involve a range of informal data collection techniques such as semi-structured interviews, transect walks, mapping, and wealth and matrix ranking
results monitoring	monitoring of the outcomes and impacts of a project, ie monitoring of project purpose and goal as defined in logical framework analysis