

Project Appraisal and Impact Analysis

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© Centre for Financial and Management Studies
SOAS, University of London

First published 2004, revised 2007, fully revised and updated 2009, revised 2010, 2011, 2012, 2013, 2014

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Project Appraisal and Impact Analysis

Module Introduction and Overview

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1 Introduction

This module has been designed around the core areas of project planning, investment appraisal, social cost-benefit analysis, project risk, distributional effects and impact assessment.

It covers both private and public sector investment and appraisal techniques, but has an emphasis on development projects, which are wholly or partially funded from the public sector.

The techniques of project financial and economic analysis and impact assessment are becoming increasingly important as methods for choosing between projects where resources, both financial and human, are limited. The use of recognised assessment techniques for project proposals has become mandatory as part of the selection and justification process for projects funded by the international financial institutions such as the World Bank, the International Finance Corporation, the African, Asian and Inter-American Development Banks as well as regional banks and other donor agencies. However, while financial and economic issues relating to resource allocation for projects, development programmes and policies are all important, policy makers and development banks and institutions are increasingly concerned with other issues – including the environmental, social, gender, health, poverty and welfare impacts of projects.

2 The Module Structure

Unit 1

The first unit of the module gives an overview on project appraisal and evaluation, an activity often referred to as *project assessment*. The project cycle considers the logical sequence of events from project identification through to *ex post* monitoring and evaluation, once the project has been financed and is set up and running. Programmes and projects affect different interest groups (stakeholders); these are considered in stakeholder analysis. Logical framework analysis provides a structure whereby the targets of a project/ development programme are set; it also provides indicators, whereby project progress and achievements may be assessed.

Unit 2

Unit 2 considers the *investment appraisal* techniques that are used in the private sector. Investment is defined as real capital formation such as the production or maintenance of machinery or housing construction; these types of investment will produce a stream of goods and services for future consumption. Investment involves the sacrifice of current consumption and the production of investment goods, which are used to produce goods or services, and it includes the accumulation of inventories. Investment appraisal is the evaluation of prospective costs and revenues generated by an investment in a capital project over its expected life. Such appraisal includes the assessment of risks (although this is covered separately in Unit 5) and

uses a number of different techniques for deciding whether to commit resources to the project. These techniques include discounted cash flow (DCF) and the calculation of net present value (NPV) internal rate of return (IRR).

Unit 3

Unit 3 develops the theoretical and applied background to social cost-benefit analysis. The basic tool of social cost-benefit analysis considers the direct costs and benefits of a project but also the wider costs and benefits at the level of the national or regional economy of a country. Social cost-benefit analysis is used mainly for projects where there is public sector investment and where there are wider development aims over and above those of generating revenues and profits, which are the main concern of the private sector.

Unit 4

Unit 4 is about the main valuation techniques of Revealed Preference and Contingent Valuation for the measurement of project impacts that either lack a market price or which can be used to calculate shadow prices and the unit analyses the strengths and weaknesses of these valuation techniques. It also covers cost-effectiveness analysis in situations where project benefits are not measurable and assesses the most appropriate project evaluation techniques for different economic sectors. It provides a critical review of the advantages and limitations of social cost-benefit analysis.

Unit 5

Unit 5 deals with the issues of risk and uncertainty and presents some of the methods of dealing with this aspect of project appraisal. It covers the different *types* of risk and uncertainty implicit in projects, and some of the techniques for dealing with risk and uncertainty and their strengths and weaknesses. Risks may include physical (climate, weather, earthquakes and other natural disasters), financial, monetary (foreign exchange movements), planning and security risks. As well as risk, to which a probability of occurrence may be assigned, there is another element in project appraisal – *uncertainty*, to which a probability cannot be assigned.

Unit 6

Unit 6 considers some of the important issues associated with the impacts of projects on the distribution of income in country and how SCBA may be used to take these distributional issues into account. When appraisals are being carried out in the context of poverty reduction strategies, the impact on distribution is crucial.

Unit 7

Unit 7 is concerned with the Environmental and Social Impacts Assessment (ESIA) of projects. Many governments, project financiers and project developers require Environmental Impact Assessment (EIA) or ESIA as part of the *ex ante* project appraisal process.

Unit 8

Unit 8 is about the tools that are used to support Environmental and Social Impacts Assessment (ESIA), ways of improving the effectiveness of ESIA and other techniques, besides ESIA, that are used to appraise the environmental and social implications of projects.

Unit 1 Project Appraisal and Evaluation – An Introduction

- 1.1 Project Appraisal and Evaluation – an Overview
- 1.2 What is a Project?
- 1.3 The Project Cycle
- 1.4 Project Planning Techniques
- 1.5 Project Quality Factors and Basic Needs
- 1.6 The Measurement of Project Performance
- 1.7 Summary and Conclusions

Unit 2 Investment Appraisal Techniques

- 2.1 Introduction
 - 2.2 Cash Flow Analysis
 - 2.3 Private Sector Appraisal Techniques
 - 2.4 An Introduction to Spreadsheet Modelling
 - 2.5 Mutually Exclusive Projects and Other Issues
 - 2.6 Summary and Conclusions
- Exercise: Mills Electronics Ltd.

Unit 3 Social Cost-Benefit Analysis

- 3.1 Introduction
- 3.2 Basic Steps in Social Cost-Benefit Analysis
- 3.4 The Social Discount Rate
- 3.5 Applications of Cost-Benefit Analysis
- 3.6 Summary and Conclusions

Unit 4 Valuation Techniques, Applications in Various Sectors and Case Studies

- 4.1 Introduction
- 4.2 Revealed Preference (Indirect) Methods
- 4.3 Contingent Valuation (CV) Methods
- 4.4 Cost-Effectiveness Analysis (CEA)
- 4.5 Sector Analysis and Case Studies
- 4.6 The Limitations of Social Cost-Benefit Analysis
- 4.7 Summary and Review

Unit 5 Risk and Uncertainty Analysis in Project Appraisal

- 5.1 Introduction
- 5.2 Risk and Uncertainty
- 5.3 Techniques for Risk Analysis
- 5.4 Uncertainty
- 5.5 Risk and Large Projects
- 5.6 Spreadsheet Modelling and Risk Analysis
- 5.7 Summary and Conclusions

Unit 6 Distributional Issues and Social Cost-Benefit Analysis

- 6.1 Introduction
- 6.2 Measurement of Income Distribution
- 6.3 Theoretical Basis for Welfare or Distributional Weighting
- 6.4 Regional Weights
- 6.5 Multi-Criteria Analysis
- 6.6 Summary and Conclusions

Unit 7 Environmental and Social Impact Assessment (ESIA)

- 7.1 Introduction
- 7.2 Laying the Foundation
- 7.3 Impact Assessment, Reporting and Decision-Making
- 7.4 Impact Mitigation/Enhancement and Monitoring
- 7.5 Summary and Conclusions

Unit 8 Impact Assessment – Additional Tools and Techniques

- 8.1 Introduction
- 8.2 ESIA Tools
- 8.3 Improving the Effectiveness of ESIA
- 8.4 Thematically-Focused Forms of Impact Assessment
- 8.5 'Specialised' Assessment Techniques
- 8.6 Widening the Scope of Impact Assessment
- 8.7 Emerging Forms of Assessment
- 8.8 Summary and Conclusions

3 The Module Authors

Units 1-6 are based on material originally written by Colin Barnes, which has been extensively re-written by Tony Allen. Colin Barnes is a development economist with Masters Degrees in agricultural and development economics from the Universities of Reading and East Anglia. He has a PhD from the University of Manchester, and has published articles and given conference papers on these topics. He has taught and given seminars at the University of Wales, the University of Manchester, University of Cambridge, University of Dar es Salaam, Leicester Business School and the Open University. He is an associate fellow in economics at Leeds University Business School.

Tony Allen has recently retired from the University of Westminster in London where he was a Principal Lecturer and Subject Leader in Economics, teaching on both undergraduate and postgraduate courses. A graduate of the Universities of Hull and London, he taught at Westminster (formerly the Polytechnic of Central London) for 33 years. His research interests lie in applied microeconomics, particularly the economics of regulation, transactions costs and boundaries of the organisation, and the economics of education. He has been a member of the Associate Faculty of Henley Management College since 1986, contributing to their MBA programmes, and a Visiting Lecturer in Economics at the Middlesex University Business

School, both in the UK. He has been a tutor at the Centre for Financial and Management Studies since 2003 and an external examiner in economics at Brunel and the University of Hertfordshire.

Units 7 and 8 are written by Theo Hacking, who is a Senior Research Associate at the University of Cambridge. He has spent most of his career working in industry and as a consultant in the fields of environmental management, sustainable development and corporate social responsibility. He has specialised in social and environmental impact assessment and has a particular interest in enhancing the effectiveness of impact assessment as a tool for sustainable development. Dr Hacking has a PhD from the University of Cambridge, and his thesis explores the 'Sustainability Assessment' of mining projects. His initial degrees were BSc Eng (Civil) and MSc Eng (Environmental) from the University of the Witwatersrand. He is an active member of the International Association for Impact Assessment.

4 Study Materials

Two textbooks will be supplied to you for this module, one for Units 1-6:

Boardman A, D Greenberg, A Vining and D Weimer (2014) *Cost-Benefit Analysis – Concepts and Practice*, New International Fourth Edition, Harlow: Pearson.

and another, which is used for Units 7 and 8:

Glasson J, R Therivel and A Chadwick (2012) *Introduction to Environmental Impact Assessment*, Fourth Edition, London and New York: Routledge.

In addition, you will receive a Module Reader, with articles and examples. You will be guided through all of this reading as you work through the module.

5 Studying the Module

As you work through the module materials, there are various exercises that are designed to consolidate your knowledge and skills. We recommend that you do the exercises, most of which take half an hour or less, before you look at any model answers that are given in the unit.

At certain points we will ask you to reflect on various aspects of the policy process where you work. It will be valuable for you and your fellow students to share these reflections on the VLE. Short notes setting out the issue and the approach will enrich your and your fellow students' experience of the module.

Please feel free to raise queries with your tutor and with your fellow students, if there are things that are not clear to you. Do this as soon as you find a problem, because waiting will hold you up as you work through the module.

We hope that you will find the module instructive, useful and occasionally challenging.

6 Assessment

Your performance on each module is assessed through two written assignments and one examination. The assignments are written after week four and eight of the module session and the examination is written at a local examination centre in October.

The assignment questions contain fairly detailed guidance about what is required. All assignment answers are limited to 2,500 words and are marked using marking guidelines. When you receive your grade it is accompanied by comments on your paper, including advice about how you might improve, and any clarifications about matters you may not have understood. These comments are designed to help you master the subject and to improve your skills as you progress through your programme.

The written examinations are 'unseen' (you will only see the paper in the exam centre) and written by hand, over a three hour period. We advise that you practice writing exams in these conditions as part of your examination preparation, as it is not something you would normally do.

You are not allowed to take in books or notes to the exam room. This means that you need to revise thoroughly in preparation for each exam. This is especially important if you have completed the module in the early part of the year, or in a previous year.

Preparing for Assignments and Exams

There is good advice on preparing for assignments and exams and writing them in Sections 8.2 and 8.3 of *Studying at a Distance* by Talbot. We recommend that you follow this advice.

The examinations you will sit are designed to evaluate your knowledge and skills in the subjects you have studied: they are not designed to trick you. If you have studied the module thoroughly, you will pass the exam.

Understanding assessment questions

Examination and assignment questions are set to test different knowledge and skills. Sometimes a question will contain more than one part, each part testing a different aspect of your skills and knowledge. You need to spot the key words to know what is being asked of you. Here we categorise the types of things that are asked for in assignments and exams, and the words used. All the examples are from the centre for Financial and Management Studies examination papers and assignment questions.

Definitions

Some questions mainly require you to show that you have learned some concepts, by setting out their precise meaning. Such questions are likely to be preliminary and be supplemented by more analytical questions. Generally 'Pass marks' are awarded if the answer only contains definitions. They will contain words such as:

- Describe
- Define
- Examine
- Distinguish between

- Compare
- Contrast
- Write notes on
- Outline
- What is meant by
- List

Reasoning

Other questions are designed to test your reasoning, by explaining cause and effect. Convincing explanations generally carry additional marks to basic definitions. They will include words such as:

- Interpret
- Explain
- What conditions influence
- What are the consequences of
- What are the implications of

Judgment

Others ask you to make a judgment, perhaps of a policy or of a course of action. They will include words like:

- Evaluate
- Critically examine
- Assess
- Do you agree that
- To what extent does

Calculation

Sometimes, you are asked to make a calculation, using a specified technique, where the question begins:

- Use indifference curve analysis to
- Using any economic model you know
- Calculate the standard deviation
- Test whether

It is most likely that questions that ask you to make a calculation will also ask for an application of the result, or an interpretation.

Advice

Other questions ask you to provide advice in a particular situation. This applies to law questions and to policy papers where advice is asked in relation to a policy problem. Your advice should be based on relevant law, principles, evidence of what actions are likely to be effective.

- Advise
- Provide advice on
- Explain how you would advise

Critique

In many cases the question will include the word 'critically'. This means that you are expected to look at the question from at least two points of view, offering a critique of each view and your judgment. You are expected to be critical of what you have read.

The questions may begin

- Critically analyse
- Critically consider
- Critically assess
- Critically discuss the argument that

Examine by argument

Questions that begin with 'discuss' are similar – they ask you to examine by argument, to debate and give reasons for and against a variety of options, for example

- Discuss the advantages and disadvantages of
 - Discuss this statement
 - Discuss the view that
 - Discuss the arguments and debates concerning
-

The grading scheme

Details of the general definitions of what is expected in order to obtain a particular grade are shown below. Remember: examiners will take account of the fact that examination conditions are less conducive to polished work than the conditions in which you write your assignments. These criteria are used in grading all assignments and examinations. Note that as the criteria of each grade rises, it accumulates the elements of the grade below. Assignments awarded better marks will therefore have become comprehensive in both their depth of core skills and advanced skills.

70% and above: Distinction As for the (60-69%) below plus:

- shows clear evidence of wide and relevant reading and an engagement with the conceptual issues
- develops a sophisticated and intelligent argument
- shows a rigorous use and a sophisticated understanding of relevant source materials, balancing appropriately between factual detail and key theoretical issues. Materials are evaluated directly and their assumptions and arguments challenged and/or appraised
- shows original thinking and a willingness to take risks

60-69%: Merit As for the (50-59%) below plus:

- shows strong evidence of critical insight and critical thinking
- shows a detailed understanding of the major factual and/or theoretical issues and directly engages with the relevant literature on the topic
- develops a focussed and clear argument and articulates clearly and convincingly a sustained train of logical thought
- shows clear evidence of planning and appropriate choice of sources and methodology

50-59%: Pass below Merit (50% = pass mark)

- shows a reasonable understanding of the major factual and/or theoretical issues involved
- shows evidence of planning and selection from appropriate sources,
- demonstrates some knowledge of the literature
- the text shows, in places, examples of a clear train of thought or argument
- the text is introduced and concludes appropriately

45-49%: Marginal Failure

- shows some awareness and understanding of the factual or theoretical issues, but with little development
- misunderstandings are evident
- shows some evidence of planning, although irrelevant/unrelated material or arguments are included

0-44%: Clear Failure

- fails to answer the question or to develop an argument that relates to the question set
- does not engage with the relevant literature or demonstrate a knowledge of the key issues
- contains clear conceptual or factual errors or misunderstandings

[approved by Faculty Learning and Teaching Committee November 2006]

Specimen exam papers

Your final examination will be very similar to the Specimen Exam Paper that you received in your module materials. It will have the same structure and style and the range of question will be comparable.

The Centre for Financial and Management Studies does not provide past papers or model answers to papers. Our modules are continuously updated and past papers will not be a reliable guide to current and future examinations. The specimen exam paper is designed to be relevant to reflect the exam that will be set on the current edition of the module.

Further information

The VLE will have documentation and information on each year's examination registration and administration process. If you still have questions, both academics and administrators are available to answer queries.

The Regulations are also available at www.cefims.ac.uk/regulations.shtml setting out the rules by which exams are governed.

UNIVERSITY OF LONDON

Centre for Financial and Management Studies

MSc Examination

Postgraduate Diploma Examination

for External Students

91DFMC207

91DFMC307

FINANCE

PUBLIC POLICY & MANAGEMENT

PUBLIC FINANCIAL MANAGEMENT

Project Appraisal & Impact Analysis

Specimen Examination

This is a specimen examination paper designed to show you the type of examination you will have at the end of this module. The number of questions and the structure of the examination will be the same, but the wording and requirements of each question will be different.

The examination must be completed in **THREE** hours. Answer **THREE** questions.

The examiners give equal weight to each question; therefore, you are advised to distribute your time approximately equally between three questions.

You should, where possible, illustrate your answers with references and/or practical examples from the module and from your own experience.

| |
|--|
| <p>DO NOT REMOVE THIS PAPER FROM THE EXAMINATION ROOM. IT MUST BE ATTACHED TO YOUR ANSWER BOOK AT THE END OF THE EXAMINATION.</p> |
|--|

Answer THREE questions.

1. The World Bank is considering lending US\$300 million for improving water supply in Shanghai, China. Local sources of finance will contribute an additional US\$100 million. There are a number of different project options:
 - a) Concentrate on water supply to higher income and high technology areas where the most dynamic economic development is taking place Project Cost US\$150 million.
 - b) Concentrate on water supply to lower income households where there are water shortages: Project Cost US\$300 million.
 - c) Place emphasis on water supply for industry where water shortages are threatening to act as a bottleneck on production: Project Cost US\$170 million.

Discuss and illustrate with figures how you would choose the optimum solution, which may be one of the options or a combination of elements of more than one.

2. International financial institutions such as the World Bank, Asian and African Development Bank commonly use Social Cost Benefit Analysis technique for project appraisal. Discuss the strengths and weaknesses of the technique using practical examples from case studies or your own experience.
3. Explain how the approaches to project appraisal differ between commercial projects in the private sector (eg a milk and cheese processing plant) and a public sector project (eg the construction of a dam for water supply and electricity production). Consider in particular the differences between financial and economic analysis of a project.
4. Describe project cycle analysis and management. Using a specific example, evaluate the extent to which this process leads to the identification and implementation of viable projects.
5. Discuss the main features of environmental impact analysis and the extent to which it needs to be complemented by other impact analysis — economic, social and health impact assessment. Suggest ways in which different impact analyses may be integrated in both *ex ante* and *ex post* appraisal.
6. The development of a highway project through a forested area of Cameroon in Africa is seen as a way of opening up the country; improving the movement of labour goods and services; and, contributing to national economic growth. Assess the possible risks associated with such a project and how these would be approached through quantitative and qualitative analysis and describe the techniques that you might use for risk assessment.

7. The Ministry of Health in a government wants to sign a loan with the World Bank for US\$100 million for investment in the health care sector. There are various options for the project:
- a) Investment in a new urban hospital in the capital an urban area, which is relatively wealthy compared to rural areas of the country, but where the population is increasing by 5% per annum through in-migration.
 - b) The construction of three smaller rural hospitals in each of three poorer rural regions of the country.
 - c) Total investment to be directed to an extensive system of rural clinics in all the rural provinces of the country.

Each of these options brings different levels of benefits. Which welfare and income distribution criteria would you apply to each of these options to choose an optimal project in terms of addressing poverty and targeting the poorest income groups?

8. Social Impact Assessment in large-scale infrastructure projects may conflict with the project economic analysis.

Discuss this statement with reference to *ONE* of the following:

- a) a large oil and gas pipeline project;
OR
- b) a multipurpose dam project;
OR
- c) a reforestation project in an area of subsistence agriculture and semi-subsistence agriculture.

[END OF EXAMINATION]

7 Glossary

There are a number of technical terms and specialised concepts introduced in this module. The following glossary includes the main ones as a reference guide during your study of the module.

Definitions

Benefit-cost Ratio The ratio of discounted benefits to discounted costs

Biophysical The non-human environment, including living organisms (plants and animals) and non-living matter (eg water and air)

Cash flow The flow of money to and from a company, enterprise or project

Consumer Surplus The additional benefit received over and above the amount actually paid by consumers

Consumption rate of interest The same as the Social Rate of Discount (see below)

Contingent Valuation A process of asking people how much they would be willing to pay for a good or service or how much they are willing to accept to give it up

Cost-effectiveness analysis (CEA) Analysis which compares the costs of alternative ways of producing the same or similar outputs

Cost of illness Uses the value of treatment costs of those who fall ill as a result of, say, poor air quality, as the value of the costs of that pollution

Critical Path Analysis The analysis and sequencing of each task in a process to calculate the optimum sequence for completion

Cultural/Heritage Impact Assessment Assessment of impacts on anything that may have aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value

Cumulative Effects Assessment Assessment of impacts due to numerous separate developments, which might be insignificant on their own, but which can interact or combine to cause significant impacts

Defensive expenditures and replacement costs DE is the monetary amount that people would be prepared to spend on, say their environment, to prevent its degradation, and RC represents the cost of restoring that environment to its original state after it has been damaged

Diminishing marginal utility The more that someone consumes of a particular good, the less value or utility an extra Unit of that good will have

Discount rate The annual percentage rate at which the present value of a unit of value is assumed to reduce with time

Discounted cash flow (DCF) A method of appraising investments based on the idea that the value of a specific sum of money depends precisely on when it is received, the value reducing with time

Depreciation The loss of value of capital goods due to wear and tear, ageing or technical obsolescence

Economic efficiency The present value of a project's social benefits less the present value of its social costs

Economic Impact Assessment Assessment of the impacts of a project on the wider economy, which can be direct, indirect, induced or fiscal

Engagement Process of interacting with stakeholders to produce better decisions/outcomes. The level of engagement may increase in level, as follows: inform, consult, involve, collaborate, empower

Equator Principles Initiative of financial institutions whereby the signatories commit to assessing potential investments in accordance with the International Finance Corporation's Performance Standards on Social and Environmental Sustainability (www.equator-principles.com)

Evaluation An assessment of the efficiency, effectiveness, impact, sustainability and relevance of a project in the context of stated objectives

Ex ante appraisal Appraisal carried out before a project is started, based on prediction and extrapolation

Ex post evaluation An evaluation of a completed project

Externalities Also known as spill-over effects and intangible effects – the impacts of a project on third parties or society in general not captured by markets and therefore market prices

Financial analysis The type of investment appraisal carried out by profit seeking businesses – it involves the evaluation of the prospective costs and revenues generated by an investment in a capital project over its expected life, excluding non-monetary items and externalities

Gini Coefficient A coefficient based on the Lorenz curve showing the degree of inequality in a frequency distribution such as personal incomes. If the frequency distribution is equal, the Lorenz curve coincides with the 45° line

Health Impact Assessment A combination of procedures, methods and tools by which a policy, programme or project may be judged as to its potential effects on the health of a population, and the distribution of those effects within the population (World Health Organisation)

Hedonic pricing Hedonic pricing is a method of establishing an economic value for environmental factors such as pollution and environmental degradation; the method uses a surrogate measure such as the impact of pollution on property and land prices, and it assumes that there is specific data on land and property prices which can be assessed against pollution – this is a technique used for calculating revealed preferences (RP)

Human Capital The technique attempts to measure earnings of individuals to value the impacts of such events as education, health-care, risks of accidents and death – a technique used for calculating revealed preferences (RP)

Impact Any change (beneficial or adverse) in the environment (social or biophysical) as a result of human activity

Impact Analysis A detailed accounting of the environmental, health and social impacts of a project

Infrastructure projects Infrastructure projects are normally concerned with the provision of roads, airports, ports, sewage and water systems, railways, telecommunication and other public utilities such as schools, hospitals and clinics; such projects are basic to economic development and improvements in infrastructure may also be used to attract industry and investment to a particular country and or region

- Integrated Assessment** Forms of impacts assessment that aim to align/combine a number of established assessment techniques (eg Economic Impact Assessment + Social Impact Assessment), and/or to compare/explore interrelationships between themes (eg biophysical and social)
- Internal rate of return (IRR)** The discount rate that produces a NPV of zero
- Investment appraisal** The evaluation of the prospective costs and revenues generated by an investment in a capital project over its expected life
- Kaldor-Hicks Compensation Test** A project or policy should be adopted only if those who gain could fully compensate those who lose and still be better off
- Life-Cycle Assessment** Compilation and evaluation of the inputs, outputs and the potential environmental impacts of a product system throughout its life cycle
- Logical Framework Analysis** A methodology for planning, managing and evaluating programmes and projects, involving stakeholder analysis, problem analysis, analysis of objectives and strategies, preparation of the log-frame matrix and activity and resource schedules
- Lorenz curve** A graphical representation showing the degree of inequality of a frequency distribution in which the cumulative percentages of a population are plotted against the cumulative percentage of the variable under study (eg incomes, employment)
- Marginal utility of income** The extra satisfaction gained by a consumer from a small increment in income
- Mitigation** Measures to prevent/eliminate, reduce/minimise, remediate/repair or compensate adverse impacts
- Monte Carlo method** Method for estimating probabilities – it involves the construction of a model and the simulation of the outcome of an activity a large number of times
- Net Present Value (NPV)** The difference between the discounted present value of future benefits and the discounted present value of future costs
- Opportunity cost of capital** The next best alternative return available for the funds in the capital markets
- Opportunity cost** The value of the most valuable of alternative uses
- Pareto efficiency** A position in which it is not possible to make at least one person better off without making anyone worse off. Also known as allocative efficiency
- Pay Back** The period over which the cumulative net revenue from an investment project equals the original investment
- Present value** The discounted value of a financial sum arising at some future period
- Primary stakeholders** Those directly affected by a project
- Private costs and benefits** The costs incurred and the benefits received by those producers and consumers immediately involved in a project
- Private Rate of Return (PRR)** The rate of return to an individual or business of some activity or investment – only includes the costs incurred by that individual or business (private costs) and the benefits to that individual or business (private benefits)
- Production-function methods** These methods measure the impact of, for example, pollution, on production and output, and use the market prices of that production/output to value these impacts

Problem Tree A diagrammatic representation of a negative or potentially negative situation showing a cause and effect relationship

Programme A programme includes a number of related but distinct projects

Project A series of activities with set objectives to produce a specific outcome within a limited time frame

Project Cycle The project cycle follows the life of the project from the initial idea through to its completion

Public goods Goods that are both non-rivalrous in consumption and no one can be prevented from consuming them (non-excludable)

Quality adjusted life years (QALYs) Morbid life years are adjusted by subjective measures of quality where a fully functional year of life is given a weight of 1 and dysfunctional years are counted as fractions

Rate of return Net profit after depreciation as a percentage of average capital employed in the business – the rate of return calculation may be made using profit before or after tax

Relevant cash flows The cash costs and revenues incurred as a result of an investment

Return on Capital Employed (ROCE) Ratio of accounting profit generated by an investment project to the required capital outlay, expressed as a percentage

Revealed Preference (RP) The value of non-market impacts of a project are inferred from observable behaviour in markets for related goods and, in particular, purchases made in actual markets

Risk A future event or outcome to which some measure of probability can be attached

Risk analysis The determination of the probability of different outcomes for a project

Secondary stakeholders Those indirectly affected by a project's benefits

Sensitivity analysis The identification of important areas of uncertainty to test key assumptions in a systematic way in order to determine the factors that are most likely to affect project success and to identify possible measures that could be taken to improve the chances of success (eg discount rate used, project life, year in full project revenue is achieved)

Shadow price The opportunity cost to society of participating in some form of economic activity – it is applied where actual prices cannot be charged or where prices do not reflect the true scarcity value of a good

Significance The significance of impacts is typically determined by considering their magnitude/severity, extent, duration and probability – opposite ends of the spectrum are:

- highly significant impacts: Impacts that are diverse, irreversible and/or unprecedented
- low significance/insignificant impacts: Impacts that are generally site-specific, largely reversible, and – in relation to adverse impacts – readily addressed by mitigation

Social Anything relating to humans and their interactions, including economic, cultural, human rights, health and safety concerns

Social Cost-Benefit analysis (SCBA) Analysis of future cost and benefit streams from a project, including items for which the market does not provide a satisfactory measure of economic value

Social costs and benefits The total costs and benefits of a project including both the private costs and benefits and the spillovers (externalities) on third parties and society in general

Social rate of discount An adjusted discount rate in which the discount rate may be adjusted to take account of time preference: the importance of the project to future generations

Social Rate of Return (SRR) The rate of return to society as a whole of some activity or investment. Includes the social costs to society (private costs plus externalities) and the social benefits to society (private benefits and external benefits)

Social Welfare The total wellbeing of a community

Social Welfare Function An expression of society's taste for different economic states

Stakeholders The people, groups or institutions likely to affect or be affected by or have an interest in a project

Stakeholder Analysis Consultation with stakeholders on their priorities for incorporation in a project or ex-post analysis of the actual impacts of a project on stakeholders

Straight-line depreciation Where the residual (scrap value) of an asset is deducted from the original cost and the balance is divided equally by the number of years of estimated life

Strategic Environmental Assessment A systematic, on-going process for evaluating, at the earliest possible stage of publicly accountable decision-making, the environmental quality, and consequences, of alternative visions and development intentions incorporated in policy, planning or programme initiatives, ensuring full integration of relevant biophysical, economic, social and political considerations

Sustainability Assessment Assessment processes that aim to determine whether or not an initiative will contribute to sustainable development

Switching value (decision pivot point) The percentage change in a project variable (investment costs, revenue etc) required to change the NPV to zero by interpolation

SWOT Analysis A technique for identifying the Strengths, Weaknesses, Opportunities and Threats of a situation

Total Economic Value (TVA) The total economic value of the natural environment is the sum of the use and non-use values of that natural environment

Travel Cost Method (TCM) The value of an environmental location is the time and cost that people take to travel to that location plus the admission charge if there is such a charge

Triple bottom-line Term used in the business literature to refer to companies expanding their traditional focus on the financial 'bottom-line' to also take into account (biophysical) environmental and social performance, ie people, planet and profit

Uncertainty A future event or outcome to which no probability of its occurrence can be attached

Vulnerable individuals or groups People who are differentially or disproportionately sensitive to change (or in need of change), since they are underrepresented, disadvantaged or lacking in power/influence/capacity

Weighted Average Cost of Capital (WACC) Investment projects may be financed by debt and/or equity in the private sector – the respective costs of both types of finance

are weighted by the proportions used to finance a particular project in order to calculate that project's cost of capital

Welfare/Distributional Weights The weighting attached to a particular cost or benefit for a particular project beneficiary

Willingness to accept The compensation required to return an individual to his or her original state of economic well-being following some change (possibly hypothetical) in the world

Working capital The cash to fund the stock of goods/inputs that a business needs to hold in order to operate

Willingness to pay The willingness of an individual to pay in order to get a good or services

Project Appraisal and Impact Analysis

Unit 1 Project Appraisal and Evaluation – An Introduction

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Unit Content

This first unit of the module gives an overview on project appraisal and evaluation, an activity often referred to as *project assessment*. The project cycle considers the logical sequence of events from project identification through to *ex post* monitoring and evaluation, once the project has been financed and is set up and running. Programmes and projects affect different interest groups (stakeholders); these are considered in stakeholder analysis. Logical framework analysis provides a structure in which the targets of a project/development programme are set; it also provides indicators, so that project progress and achievements may be assessed.

Learning Outcomes

After reading this unit and its associated readings, you will be aware of and be able to understand, analyse and discuss:

- the reasons for project and programme appraisal and evaluation
- the significance of the project cycle and the different stages and components of the project cycle
- the reasons for undertaking stakeholder analysis
- the importance and limitations of logical framework analysis.



Readings for Unit 1

Reader

European Commission (2005) *Project Cycle Management Guidelines*, Luxembourg: Office for Official Publications of the European Commission, Chapters 4 and 5.

Ahonen P (1999) 'General considerations and user experiences of project cycle management in a small donor-transitional country context', *Impact Assessment and Project Appraisal*, 17, 2, 97–105.

1.1 Project Appraisal and Evaluation – an Overview

Project appraisal and evaluation are often referred to together as *project assessment*. *Project appraisal* is concerned with assessing, in advance, whether a project is worthwhile and therefore if it should be proceeded with. The process of *project evaluation* is concerned with assessing, in a retrospective sense, the performance of a project after it has been implemented and completed.

Such a process of policy assessment occupies a central place in public policy and management. Many of the issues of public policy and management are about resource allocation, the trade-offs between different policy measures and the impacts of those policy measures on the economy and on society. Management in the public sector is subject to budgetary constraints and often to political pressures; project appraisal techniques may help in the decision process and obtain a more efficient allocation of resources.

1.2 What is a Project?

Gittinger (1982) defines a 'project' as

... an investment activity upon which resources – costs – are expended to create capital assets that will produce benefits over an extended period of time and which logically lends itself to planning, financing, and implementing as a Unit. A specific activity, with specific starting point and specific ending point, intended to accomplish a specific objective. The smallest operational element prepared and implemented as a separate entity in a national plan or program. Generally unique in that it is not a segment of an ongoing program, although it may be a 'time slice' – a portion lasting several years – of a long-term programme.

Or, put more succinctly, 'The whole complex of activities for which money will be spent in expectation of returns' (*ibid*).

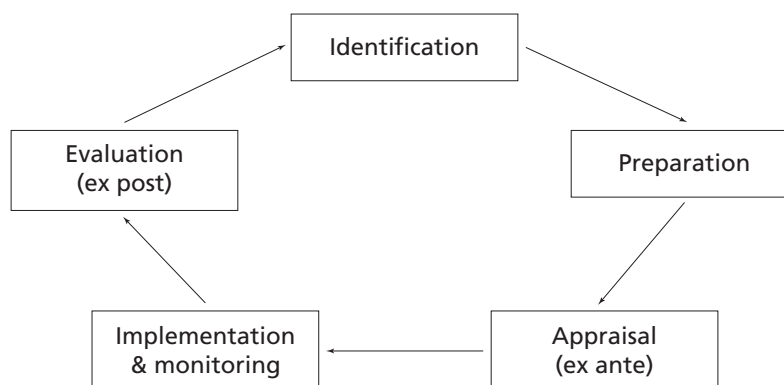
In this sense, each project, such as building a highway, is regarded as a discrete or separate activity. A *programme* may be defined as a group of related projects in a similar area such as a highways programme. Throughout the module when reference is made to projects this may include programmes or policies that are collections of projects and interventions.

1.3 The Project Cycle

The appraisal and evaluation of projects, programmes and policies is best seen in the context of the project cycle, the stages of which are shown in Figure 1.1. The process begins with *project identification* and ends with *project evaluation*. To ensure that projects meet their original objectives, it is usual to set up an evaluation framework, which allows project finance agencies, policy makers and other stakeholders to assess the success of the project through *the monitoring and evaluation process*. The project cycle consists of the following stages:

- project identification
- project preparation
- *ex ante* project appraisal¹
- implementation and monitoring
- *ex post* project evaluation.

Figure 1.1 The Project Cycle



The idea behind the project cycle is that there are a number of sequential processes from the identification of a project through to the completion of the project. It is important that *ex-post* project evaluation is carried out in order to assess the impacts of the project and whether it achieved its original objectives. There are a number of different tools you will learn later in this module which are used at different stages in the project cycle. They include:

- financial and economic analysis (*ex ante* project appraisal) – Units 2, 3 and 4
- impact analysis (monitoring and evaluation and *ex-post* project evaluation) – Units 7 and 8
- risk analysis (project preparation, *ex ante* project appraisal) - Unit 5.

1.3.1 The identification stage

This is the conception stage in a project's life cycle. In the past, the procedure that led national governments and other borrowers to generate proposals for external financing was fairly ad hoc (meaning that proposals were generated in isolation, as and when they were considered necessary, and with no reference to other potential projects). In recent years, major donor agencies (such as the World Bank) place much emphasis on project identification as an important element in the overall success of the project. Defined priority areas within broad development strategies are used to encourage project generation, for instance, or to screen incoming projects.

In-depth knowledge and experience of local conditions can be an important source of suggestions for project formulation, as can occasional field missions and technical surveys aimed at identifying potential projects. Domestically, public sector projects are usually derived from the planning process or from political imperatives of national governments and their

¹ *ex ante* means 'before'; *ex post* means 'after'; the terms are taken from Latin.

agencies, whereas private sector projects usually result from the identification of an opportunity for profit. Factors that complicate project identification in practice are numerous and include such issues as conflicting interests between involved parties (local and regional bodies, sectoral ministries, national governments and external donors) and varying levels of capability in project formulation.

1.3.2 Preparation

Projects that survive the early stage of successful identification need to be prepared and analysed before money is allocated to them. Although this is formally a borrower responsibility, in practice it is common for donor agencies to extend technical and financial assistance to borrowing countries to assist them in the preparation and analysis of projects. A 'project brief' is used to describe the project's objectives, its main issues and the timetable within which its implementation and processing are conceived. The length of time taken for preparation and analysis is not fixed: it will almost certainly be a function of the nature of the project (its size, borrower experience, whether it is a new project or the extension of an existing one, etc). Often it may also involve a feasibility study (or a sequence of them) to establish at an early stage which projects are worth pursuing further. Consideration of alternatives is important at this stage as another 'early signalling' mechanism for deciding worthwhile projects.

Through careful and detailed analysis, projects are likely to be shaped and redefined (sometimes to the point where they do not look anything like their original form) to take them a step closer to the realistic conditions under which they may be implemented. This is required for detailed planning, which should take account of the full range of technical, institutional, social, environmental, commercial, financial and economic aspects of the project that we introduced earlier (see the last section).

1.3.3 Appraisal

This is probably the best-known stage of the cycle, and how to appraise investment projects is at the heart of this module. The purpose of project appraisal is to establish whether a project is worthwhile in the light of its costs in terms of resource commitments and the project's expected benefits. That is, appraisal is an *ex ante assessment* of a project and is the key element in the decision as to whether or not to proceed with a project. This will involve the consideration of alternative projects (the *with* option[s]), or alternatively, by comparison with the status quo (that is, the *do-nothing* option). In practice, this is an intricate and sophisticated process of enquiry, with substantial data requirements. Examination of the viability of the project may require the specialised services of appraisal missions and appointed consultants. Appraisal covers four major aspects of the project: technical, institutional, financial and economic.

Technical aspects

This is mainly concerned with issues related to physical scale, layout, location of facilities, technology used, cost estimates and their relation to engineering or other data on which they are based, proposed procurement

arrangements, procedures for obtaining engineering, architectural or other professional services, the potential impact on the human and physical environment, and a range of other similar concerns related to the technical adequacy and soundness of the project.

For instance, in the technical appraisal of an educational project considerations will have to be given to the curriculum, the number and nature of educational establishments, their physical facilities (classroom, space, laboratories, libraries, and equipment), personnel, skills gaps and training requirements, etc.

Institutional aspects

The objective of many projects is not merely to add to physical assets and capital, but also to create and enlarge human and institutional capabilities to manage and maintain development undertakings.

Institutional appraisal is concerned with a large number of questions which deal with the adequacy or otherwise of such human capability and the institutional framework in which projects are implemented. This is possibly the most challenging aspect of the project's overall success. There may be no shortage of technically well-designed and well-endowed projects (in terms of their 'hard' inputs). However, many projects have limitations at the human and institutional level (the so-called 'soft' inputs). Therefore project appraisal requires careful and sensitive consideration of the institutional dimension and local conditions.

Financial and economic aspects

Since these two aspects of project appraisal constitute a main part of the module, they are only briefly reviewed here. Financial appraisal (investment appraisal) is explained in Unit 2 and is concerned with such questions as the adequacy of funds, the financial viability of the project, the borrower's ability to service debt, procedures for recovering investment and operating costs, etc, and, ultimately, does the project return a profit? This is different from economic appraisal (explained in Units 3 and 4), which addresses the issue of whether a project is worthwhile from the broader point of view of its contribution to aggregate or national economic and social welfare through the use of social cost-benefit analysis as the appraisal technique.

The appraisal process consists of the following steps (all these are covered, as indicated, in subsequent units in this module):

- Identifying and valuing the costs and benefits of each option – see Units 2, 3 and 4.
- If required, adjusting the valued costs and benefits for *distributional impacts* (the effects on different groups in society) – see Unit 6. Adjusting for the timing of the incidence of costs and benefits, by discounting them, to obtain their present values – see Units 2 and 3.
- Adjusting for risk and uncertainty – see Unit 5.
- Consideration of unvalued impacts, using weighting and scoring techniques if appropriate; see Unit 6. These unvalued impacts might also be shown by the use of *impact analysis* – see Units 7 and 8.

Source: adapted from 'The Green Book', HM Treasury (2003)

1.3.4 Implementation and monitoring

A project that is considered to be worthwhile at the appraisal stage qualifies for implementation. In practice, implementation tends to be complicated by many unforeseen problems. Therefore flexibility is required at this stage to enable the successful execution of the project. The process of implementation can be long and drawn out (depending on the nature of the project and the time period over which it spans). It is normal to consider it over three phases:

- investment
- development
- operation.

There is considerable variation in the length of each of these stages between different projects (infrastructure projects tend to have long investment periods, for example). It is probably true to claim that a project is as good as its execution. Thus, implementation of a project is another critical stage in the project's life cycle.

While the project is being carried out, continuous monitoring is required to satisfy those people implementing the project that things are proceeding according to plan. Monitoring typically requires an effective information gathering and management system that can check the progress of the project according to the plans that have been drawn up and the project objectives.

1.3.5 Evaluation

Once the project is completed (and possibly also several times during its implementation), it needs to be evaluated so as to enable analysts (borrowers or lenders) to assess its performance and outcome. Thus, evaluation is an *ex post assessment* of whether the project was worthwhile. It seeks to answer such questions as:

- has the project been successful in attaining its objectives?
- if not, in what respect has it failed?
- how might its design and / or implementation have been improved?


All World Bank-assisted projects are now subjected to an *ex post* audit. It allows a reworking of the estimates of the economic rate of return on the basis of actual implementation costs and updated information on operating costs and expected benefits. Evaluation thus helps to identify elements of strength and weakness, success or failure. The results are valuable in planning future projects and in attempts to avoid repeating or committing 'mistakes'. Thus the results of the evaluation process need to be disseminated. This is why Baum (1982) described the evaluation system as 'a gold mine of information, supplementing and complementing that provided by the broader stream of project supervision reports'.



Reading

Now turn to the Reader and study Chapter 4, pages 16–53, on PCM Operational Guidelines from the European Commission's *Project Cycle Management Guidelines*. You will notice that this manual contains an additional stage, the 'financing decision'.

Although the reading covers project cycle management from the perspective of the EC, you should be able to identify the general characteristics of project cycle management and relate them to the overview provided in this Unit. The reading also describes how the logical Framework Approach is built into project cycle management. This is one of the project planning techniques, which you will examine in the next section.

 As you read this chapter, please be sure to note the following points.

- Consider Figure 4, Chapter 4, 'The Cycle of Operations', and compare it to Figure 1.1 in this unit. Make sure you understand how these two representations of the project cycle relate to each other.
- Make sure you understand and can explain the purpose of each stage of the project cycle, and what is required.
- What are the three key quality attributes used at the various stages? Note how these criteria are applied in different ways at the various stages of the project cycle, and how they are more or less important at different stages. For example, at the implementation stage, which quality attribute is applied?
- You will have noted that the three key quality attributes are whether the project is relevant; feasible; and effective and well-managed (p. 23). At the implementation phase, the effective and well-managed attribute is applied (p. 45).

Chapter 4 of the European Commission's *Project Cycle Management Guidelines* (2005), reprinted in the Reader.

1.4 Project Planning Techniques

This section will introduce various analytic techniques. Although they are cited separately, they are all linked: Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis, Problem Tree and Logical Framework Analysis are all built into the development of the project cycle. This includes the setting of project objectives to meet defined problems and the establishment of an analytical framework. In the appraisal and evaluation of the project cycle, financial and economic analysis and impact analysis have a role to play. Other techniques that may be used in project identification and preparation include methods that are used in operational research. These methods are not considered in this module in great depth but they include network, critical path (CPA) and programme evaluation and review technique (PERT) analysis and linear, non-linear programming and other optimisation techniques.

The project planning and project cycle techniques that are examined in Unit 1 are useful in that they adopt a logical approach from project identification through to project monitoring and evaluation. However, once the project is operational there are other techniques that concentrate on planning and scheduling individual project components or jobs. One of the basic techniques, used on large engineering, production and physical infrastructure projects, is *network analysis* or *critical path analysis* (CPA).

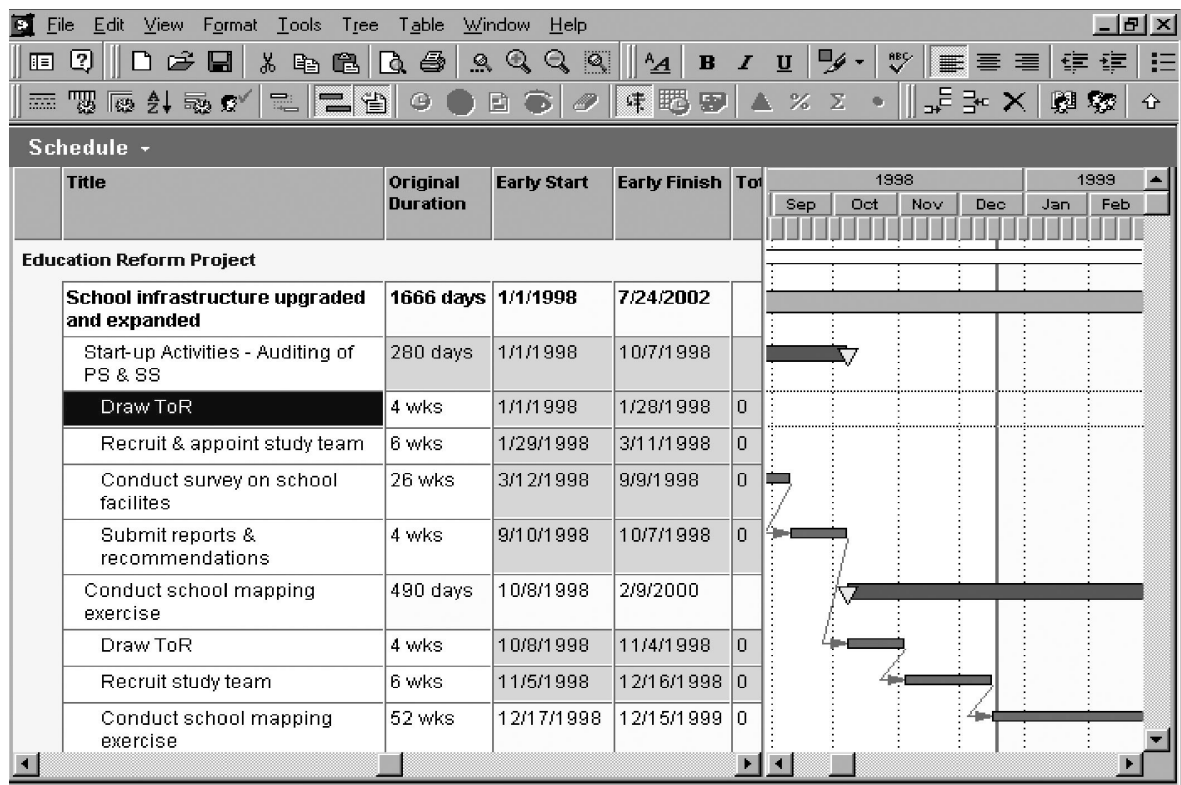
1.4.1 Critical Path Analysis (CPA)

Critical Path Analysis is the organised application of systematic reasoning to planning, scheduling and controlling practical situations where many separate jobs, which make up the whole task, can happen simultaneously, almost simultaneously or in sequence such that it is difficult intuitively to establish the relationship between the separate jobs or project components. CPA identifies three phases:

- *Planning Phase* – this clarifies the objective of the project and the arrangement of project tasks into an order of precedence. Some tasks will be carried out in parallel, others in series.
- *Scheduling Phase* – this develops from the planning phase and converts the plan into a feasible and readily implemented schedule, having analysed the path with reference to the optimum use of available resources such as time, human resources and equipment.
- *Control Phase* – this develops from the scheduling phase and allows actual progress to be monitored and corrections to be made to ensure adherence to the schedule or modified schedule.

Figure 1.2 (below) shows the CPA phases for an education project, using Team Technologies UP software.

Figure 1.2 Example of Team UP Software for Critical Path Analysis



1.4.2 Programme Evaluation and Review Technique (PERT Analysis)

Another component of network analysis is Programme Evaluation and Review Technique (PERT). PERT analysis differs from CPA in that it allows for uncertainty by building into the project scheduling time constraints for each activity, including:

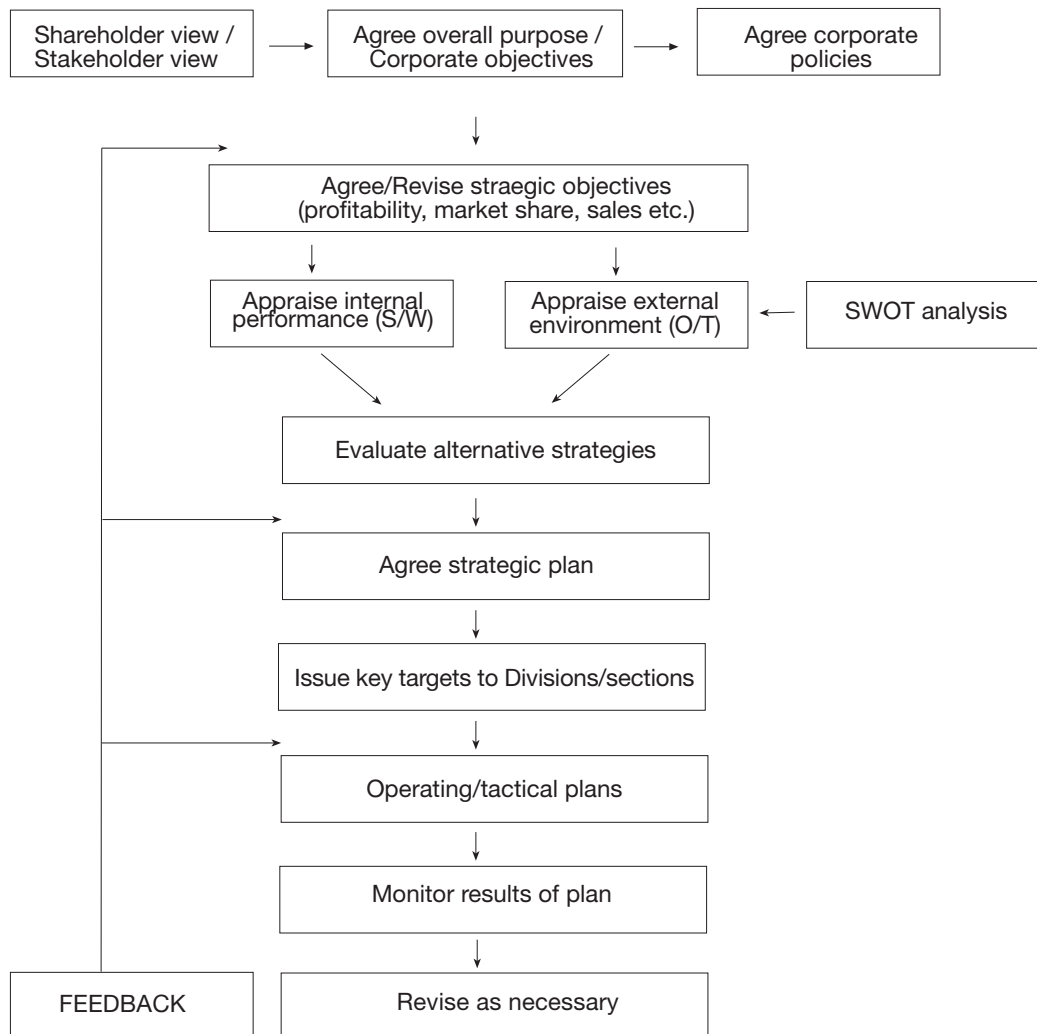
- quickest reasonable time
- most likely time
- worst time.

1.4.3 Strengths, Weaknesses, Opportunities and Threats (SWOT Analysis)

SWOT analysis is a very basic evaluative tool. It is the analysis of an organisation's *strengths and weaknesses* and *the opportunities and threats* that it faces. While strengths and weaknesses tend to concentrate on the internal characteristics of an organisation, opportunities and threats are more orientated at looking at the external resource, financial, economic and competitive environment. SWOT analysis may be used at any point within the project cycle.

SWOT analysis is used in the private sector when considering a company or organisation's competitive position in a particular market. It may also be a useful tool in corporate planning (shown in Figure 1.3).

Figure 1.3 Example of the use of SWOT Analysis in Private Sector Corporate Planning





Example

An international manufacturer of dairy products is considering investing in a dairy plant to manufacture pasteurised milk and cheese products in Kenya. The manufacturer will wish to know the strengths and weaknesses of this plant compared to existing and potential producers in the country, as well as competition from imported products.

The manufacturer will look at a number of factors before deciding to invest in the plant. This will include current milk production within the country, the pricing policy for milk where there is government intervention and, of course, estimated current and projected demand for milk and dairy products. Other issues will include the internal production costs and market price for milk as well as the possibilities for importing powdered milk, which may provide difficult competition for a local production facility. A SWOT analysis by the manufacturer will play an important role in the overall project evaluation.

SWOT analysis may be useful for both public sector and public private sector investment projects. Further examples of its use include:

- a public sector-led investment programme in integrated economic, social and environmental development in a rural region of Cornwall in the UK
- preparation of an action plan for environmental management in a coastal zone of Brazil where there is a need to balance environmental protection with economic and social development, including poverty alleviation; there is a major issue of balancing environmental management with the main sources of income generation – fisheries and natural resources extraction, agriculture, small business development and tourism
- balancing the advantages and disadvantages of investing in centralised health service delivery as opposed to investment in lower cost decentralised healthcare delivery based on rural clinics and preventative medicine.

In each of these projects, SWOT analysis was carried out early in project preparation to assess how a project or development programme should use *strengths* in a project area (natural resource base, skills, stakeholder commitment) and deal with *weaknesses* (poor infrastructure, low skills base, low access to basic services). In the medium to long term, project planners need to take into account *opportunities* (market opportunities such as the demand for project production, the development of a new port or airport) and *threats* (competition from other countries in the same sector or competition from other regions within the same country, technological change, economic shocks such as changes in oil and other world commodity prices).

1.4.4 Problem tree analysis

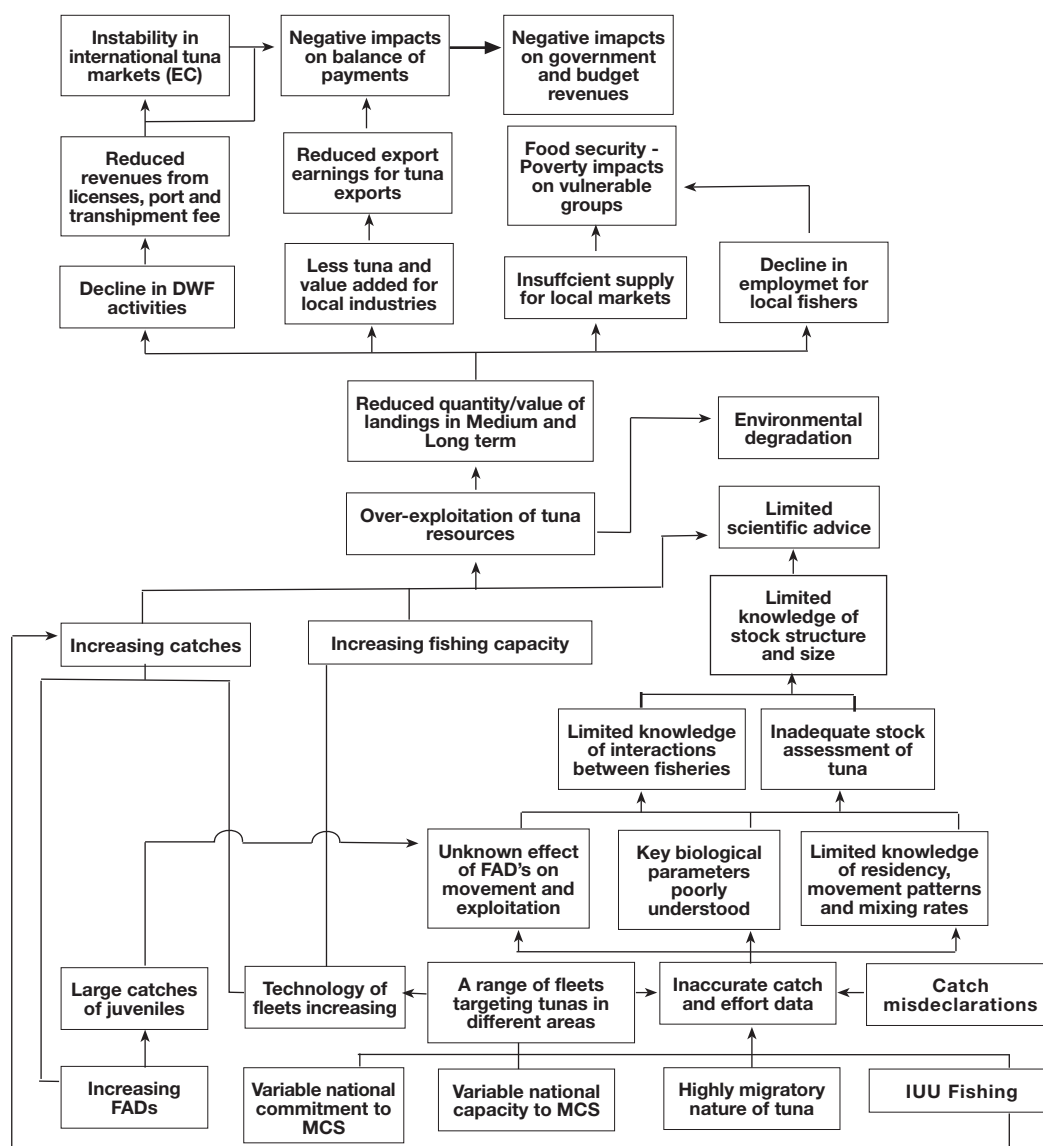
Problem tree analysis is a useful first stage in the development of a project. Problem analysis is a method of mapping out problems, showing their interconnections and predicting how a project might address those problems. The main aim is to establish the cause and effect relationships between problems that exist. It involves *three main steps*:

- precise definition of the framework and subject for analysis

- identification of the major problems faced by target groups and beneficiaries
- visualisation of the problems and their contributory factors in the form of a diagram or *problem tree* (this may be produced in Microsoft Word, Powerpoint, Visio or other proprietary software).

Figure 1.4 gives the example of a problem tree that was developed for a project on tuna tagging in the Western Indian Ocean.

Figure 1.4 Problem Tree for Fish-Tagging Project in the Western Indian Ocean



Abbreviations: DWF – Distant Water Fishing Fleet; MCS – Monitoring, Control and Surveillance; FAD – Fish Aggregation Device; IUU – Illegal, Unregulated and Unreported

Source: Marine Resources Assessment Group, London (2002)

The aim of the project was to tag tuna caught by fishing vessels, to obtain information on the movement, migratory patterns and biology of tuna. This information would allow stakeholders such as governments in coastal states of the Indian Ocean, and organisations such as the Indian Ocean Tuna Commission (IOTC), to make recommendations on tuna exploitation and catches for different species of tuna, to better protect tuna resources. This

problem tree integrates biological, economic and social aspects of tuna resources and their exploitation. From the problem tree you can see how the various problems are related.

1.4.5 Stakeholder analysis

Stakeholders are those people or organisations who are likely to be affected by a project and/or can influence the success or failure of that project. It is increasingly common in public sector and development projects for project planners and analysts involved in project design to undertake a stakeholder analysis. Stakeholder analysis allows project design and policies to take account of the various interests of those who have direct and indirect interests in the project, or upon whom the project may have impacts.

The European Commission defines stakeholder analysis as involving the identification of all stakeholder groups likely to be affected (either positively or negatively) by the proposed project, and the identification and analysis of their interests, problems, potentials, etc. The conclusions of this analysis are then integrated into the project design (European Commission, 2005). Such an analysis may be a participatory process, involving stakeholders and finding their opinions and reactions, or it can be an assessment conducted by a project analyst or planner who attempts to plan for the interests of the various stakeholder groups.

The first step is to *identify* the key stakeholders. It is common in stakeholder analysis to differentiate between *primary* and *secondary* stakeholders although the definitions of what distinguishes the two groups is less clear. The UK Overseas Development Administration (ODA²) in 1995 suggests that primary stakeholders are those affected by the project either in a positive or negative way, and secondary stakeholders are those engaged in an intermediary role in the delivery of project benefits (ODA, 1995). Stakeholders can also be categorised according to function (contributor, implementer, or beneficiary). The ODA (1995) used the *key* stakeholders concept to refer to those stakeholder groups who can influence a project significantly or who are important for the objectives of the project to be met.

The next step is to assess the stakeholders' interests and the potential impacts of the project on these interests. The identification of potential stakeholders can be done using a stakeholder matrix – see Figure 1.5 below.

Figure 1.5 Stakeholder Table

| Stakeholders | Interests | Potential Project Impact[s] +/-? | Relative Priorities of Interest |
|--------------|-----------|----------------------------------|---------------------------------|
| Primary | | | |
| Secondary | | | |

Source: ODA (1995)

² This UK government department has subsequently been renamed the Department for International Development – DFID.

The table lists the various stakeholders and indicates their interests where these are relevant to the project. These interests could include the expectations of stakeholders, the resources they are willing to commit, and any conflicts of interests. It is conventional to show the potential impact(s) as positive, negative or uncertain (?). The indication of relative priority is normally given on a scale of 1 (high priority) to 5 (low priority), and usually relates to the definition of primary and secondary stakeholders.

Clearly, different projects will have different stakeholder groups and different complexities. The issue is the degree to which stakeholder analysis successfully balances all the different interest groups involved in projects. The example described in Table 1.1 shows the potential complexity of stakeholder analysis. It is for a project aimed at encouraging farmers in Pakistan to give up poppy cultivation for heroin production, partly funded by the UK Department for International Development (DfID) in Pakistan.

Table 1.1 Example of stakeholders

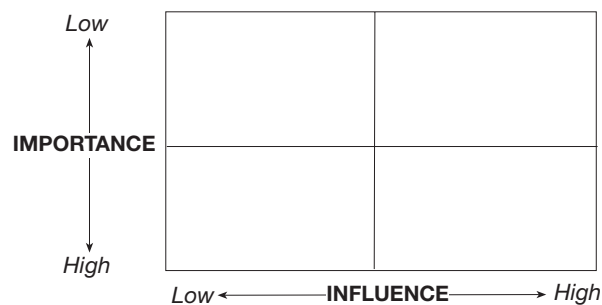
| Stakeholder | +/- | Interest |
|---|------------------|--|
| Local community | + + - | Socio-economic development Increase in non-poppy incomes Loss of poppy income |
| Farmers | + - + | Increase in non-poppy incomes Loss of poppy income New income-generating activities |
| Women | + + - | New income-generating activities Drinking water and sanitation Increased workload |
| Men | + - | Increased development Loss of control over women |
| Traffickers | - + | Loss of business Easier transport |
| Politicians | - + | Loss of influence/ control over development funds Increase in influence |
| Government of Pakistan/ Government of North West Frontier Province. | + + + | Extra funds for drug eradication More jobs Pakistan's compliance with international commitments |
| Line agencies | + + - - | More funds Gain experience Resents interference in spending funds Pressure to participate with communities |
| UNDCP | + - | Achieve policy Worry that development overrides drug control aims |
| DFID and other donors | + + + + | Achieve policy objectives Institutional strengthening Support Pakistan's compliance with international commitments Reduce world supply of opium |

| | | |
|-------------------------------|---|---|
| Special Development Unit | + | Learn from DfID |
| Chief Minister | + | Enforcement |
| | – | To please MLAs |
| Project staff and consultants | + | Keen to attain project objectives |
| | + | Future employment |
| Contractors | + | Increased contracts |
| | – | Opposed to participatory approach |
| Maliks | – | May lose dominance to community organisations |
| Poppy lancers | – | Lose jobs and income |

Source: Department for International Development (2003)

The next step is to assess the importance, power and influence of stakeholders in relation to their ability to influence the outcome of the project or programme. Some stakeholders will possess formal power derived from legal sources, control of resources, leadership authority, possession of knowledge etc, whereas others may have more informal power and influence. The importance and power of the various stakeholder groups can be listed in a table similar to those above or, alternatively by a mapping as shown in Figure 1.6 below. Importance is defined as the degree to which stakeholder groups may gain or lose from the project; influence refers to their ability to affect the success of the project.

Figure 1.6 Importance and Influence of Stakeholder Groups



Source: ODA (1995)

This suggests that stakeholders who are in the bottom right hand quadrant are the key stakeholders since they are affected to a high degree by the project and have a high influence on the outcome of the project. Thus it would be significant for these groups to be considered and involved in the project design and implementation.

If a participatory approach to project design is intended, a logical place to start is an assessment of the degree of participation expected of each group at each stage of the project life. For this a *participation matrix* can be used (see Figure 1.7). The participation matrix gives an indication of the roles of different stakeholders in the development of the project. At each stage of the project it is possible for stakeholders to be informed (provided with information); consulted for information or opinions; to participate actively; to be delegated a subsidiary role; to be controlled (not involved in planning but involved in implementation).

Figure 1.7 Participation Matrix

| | Inform | Consult | Partnership | Delegate | Control |
|---------------------------|--------|---------|-------------|----------|---------|
| Identification | | | | | |
| Planning | | | | | |
| Implementation | | | | | |
| Monitoring and evaluation | | | | | |

Source: ODA (1995)

The appropriate role for each stakeholder group will vary according to the stage reached by the project and according to the nature of the project.

Potts (2002) argues that stakeholder analysis is particularly important for projects where some degree of participation is expected from the beneficiaries in the design and/or the operation of the project. According to Potts, it can be used to gain a better understanding of the interests and needs of the various stakeholder groups affected, as well as to assess their capability to enhance or threaten project implementation. Stakeholder analysis may help to avoid major mistakes up front, by for example, revealing if a project has weak ownership that might threaten its implementation. It may also suggest strategies for overcoming opposition. It may also be useful in displaying the impacts of a project that are non-quantifiable, and also to display the distributive impacts of a project. The drawbacks to stakeholder analysis are that the data underlying the analysis is both subjective and context specific, and determination of support or opposition to a project cannot be calculated simply by adding up the groups supporting or opposing a project. While stakeholder analysis may assist in the process of making a decision as to the acceptability or not of a project, there are no clear guidelines as to how such an analysis can be used in this regard.

1.4.6 Logical Framework Analysis (LFA)

Logical framework analysis or logframe analysis (LFA) is a methodology for establishing a framework for the evaluation of projects and development programmes. It is a methodology for planning, managing and evaluating programmes and projects. LFA involves stakeholder analysis; problem analysis; analysis of project objectives; analysis of strategies; preparation of the log-frame matrix; and activity and resource schedules.

The logframe is the matrix in which the project's intervention logic, assumptions, objectively verifiable indicators and sources of verification are presented. (Intervention logic is considered in detail in the reading at the end of this section). Table 1.2 is an example of a logframe for the Indian Ocean fish-tagging study that you saw in section 1.4.4; Figure 1.4 showed the problem tree analysis.

The logframe's presentation is normally in the form of a table or matrix, which includes on one axis:

- overall objectives
- specific objectives

- results
- actions.

Against each of these headings, measurement of impacts, risks and assumptions are given on the other axis. These normally include the following:

- observable verifiable indicators (OVIs)
- the sources of verification for the indicators.

The observable verifiable indicators are quantitative and qualitative indicators, which may also be used as benchmarks and/or performance indicators for assessing and comparing project performance. The comparison of project performance, however, assumes that the indicators are compatible and that *one is comparing like with like!*

Table 1.2 Example of Logframe Analysis for Fisheries Project in Western Indian Ocean

Feasibility Study for a Proposed Indian Ocean

Tagging Programme IOTC/EDF/01

Contract: Preliminary logical framework analysis

| Narrative Statement | Objective Verifiable Indicators | Verification Sources | Assumptions/Risks |
|---|---|---|--|
| GLOBAL OBJECTIVES | | | |
| Strengthen the Regional Management of Tuna in the Indian Ocean and for the member states of the Indian Ocean Commission | Historical and projected stock trends for tuna and similar species improve; improvement in the catches and size of different species of tuna caught | Stakeholder consultations + FAO Catch and landing data from individual IOC countries | Close collaboration with IOC member states is maintained |
| SPECIFIC OBJECTIVES | | | |
| Improve size, maturity distribution of tuna species caught and landed in the WIO | Overall data on tuna biology indicate improvement in stock status | Tuna statistics and stock estimates | |
| Improvement in stock status of individual tuna species | Data on individual tuna stocks show improvement | | |
| Western Indian Ocean and the member states of the IOC | Revenues for member states from tuna and related resources increased | Maintenance and increase of tuna revenues. Sustainable exploitation | |
| Improvement in the incomes of locally based fishers who target tuna species in the Indian Ocean countries. | Increased revenues for local fishing companies + fishers. Revenues from tuna processing & local value added in IOC member states. | Catch and landing data; throughput into local tuna processing plants. Development of local tuna fishing. | |

| RESULTS | | | |
|--|--|---|---|
| 1. Detailed data on tuna biology, migration, growth patterns obtained | Results of IO and other tagging programmes | Collection of adequate data | Inadequate tag recovery + statistically robust data |
| 2. Additional data on tuna integrated into IOTC database | Tag recovery rates | | |
| 3. Details of interaction between YFT and BET stocks with other stocks | Results of tagging programmes in enhancing stock management | | |
| 4. Details of interaction between tuna stocks of Western Indian Ocean + parts of Indian Ocean | Data showing interaction | Co-ordination between WIOTTP and other programmes | |
| 5. Evidence of occurrence of natural live bait | Results of pilot live bait fishing | Localisation of sources of natural bait | |
| 6. Evidence of the impact of FADs on tuna exploitation and movement | Catch data | Catch data associated with FADs | |
| 7. Risk analysis of YFT and BET stocks in the Western Indian Ocean | Probability of future resource depletion of YFT and BET stocks | Discussion with IOTC | |
| 8. Long term management plan for the sustainable exploitation of tuna fisheries in the WIO. | | | |
| ACTIONS | | | |
| 1. Create and recruit for project management unit (PMU) including project monitoring and evaluation | Check stock assessment data for IO/IOC member states | IOTC, member states | Agreement on project finance and management with EU procedures; suitable personnel identified for the PMU |
| 2. Co-ordinate tagging programme with IOTC, stakeholders in the region and other parts of the Indian Ocean | Agreements and exchange of data on tuna tagging. Detailed tuna tagging plan produced | Other IOTC member states + Maldives | |
| 3. Prepare tender documents for tuna tagging vessel and crew | Timely preparation of tender documents following EU rules | Meeting time targets for tender docs | |
| 4. Select most favourable bid for the tuna tagging programme | Value for money | | Non-identification of appropriate tagging platform |
| 5. Establish gear and equipment needs | Meet project specifications | | |

| | | | |
|--|--|------------------------------------|---|
| 6. Identify sources of live bait (natural and from aquaculture centres) | Catches of live bait in adequate quantities | Reports from cruises on bait catch | Non-identification of adequate sources of live bait |
| 7. Commence tuna tagging at pilot scale | Number, distribution and species tagged | Tagging records | Low tagging rates |
| 8. If 7 is positive, plan more extensive tagging programme | Results positive from the pilot tagging programme | Tagging records | |
| 9. Analyse data for TTP | Analysis and annual reports produced on tuna tagging | Tagging records and analysis | |
| 10. Prepare co-ordinated plan for the future management of YFT and BET stocks based on the results of 9. | Tuna management plans produced. | | Insufficient commitment by IOC and other IO coastal states. Insufficient implementation of MCS in the WIO. |


Intelligent use of the logical framework should ensure that the design of the project is logical. However, it does not ensure that the project is the best one to implement. It also gives no guidance on issues such as income distribution, employment, participation and the environment unless these are specifically addressed in the objectives of the project. The principal value of the logical framework format is that it provides a clear summary of the basic features of a project proposal. However it is only a summary.



Readings

For a more detailed account of Logical Framework Analysis (including Stakeholder Analysis), please now read Chapter 5 of 'Project Cycle Management Guidelines', pages 57–94, which is included in the Reader. In this reading you will consider the advantages of using LFA in project cycle management, and how LFA contributes at the different stages of the cycle. There is a useful summary on pages 92–93, although this will make more sense to you after you have read the whole chapter.

Chapter 5 of the European Commission's *Project Cycle Management Guidelines* (2005), reprinted in the Reader.

 As you read Chapter 5, please also note the following points.

- Make sure you are aware of the problems associated with using LFA (and how these may be avoided).
- Be sure you understand what is meant by an iterative process in the analysis and planning stages of developing a logframe: the logframe should be reviewed as new information becomes available.
- Chapter 5 also includes consideration of problem analysis (covered in section 1.4.4 in Unit 1) and stakeholder analysis (covered in section 1.4.5), and useful examples are provided.
- What might be considered unusual about the example logframe presented in the Unit (Table 1.2)?

- Be clear about the difference between 'project results' and 'contracted outputs' (see p. 75 of the reading), and consider the significance of what is (and what is not) in the control of the contractor(s).
- Intervention logic is examined in section 5.3.2, and there is good analysis on the causality going through activities, assumptions, results, assumptions, purpose, assumptions, and objectives. There are also useful comments on how to interpret and write statements of objectives, purpose and results.
- The reading also provides some good comments on the significance of the assumptions stated in the logframe, and the probability of the assumptions being realised, and how this is part of assessing how risky the project is. This is significant for Unit 5, which concerns risk and uncertainty analysis in project appraisal.
- Make sure you understand what is meant by Objectively Verifiable Indicators (OVI), and what is required for an OVI to be 'SMART'.
- The reading suggests that Activities should be documented separately from the Logframe (p. 71 in section 5.3.1), so that the Logframe is not revised too much.



Reading

Please also read the article by Pertti Ahonen, 'General considerations and user experience of project cycle management in a small donor-transitional country context'. This article examines the experience of using PCM in a bilateral development co-operation context. This short article summarises hypotheses on the applicability of PCM, and, based on the experience in the case study, it considers some of the strengths and limits of PCM. It is also useful to see how the iterative processes within project design and implementation occur in practice, and how the people implementing the project learn and adapt. (Please note there are some typographical errors in the article).

Pertti Ahonen (1999)
'General considerations and user experiences of project cycle management in a small donor-transitional country context', *Impact Assessment and Project Appraisal*, 17, 2, reprinted in the Reader.

1.5 Project Quality Factors and Basic Needs

The Evaluation Office of the European Commission (AidCo, 2002) and other writers have drawn attention to other factors apart from the financial and economic impacts of projects. These factors are particularly relevant to development projects where the issues of project sustainability after initial finance by international financial institutions and/or donors are the keys to the long-term success of the project. The other issue, which is related, is the extent to which projects address the basic needs of the beneficiaries.

1.5.1 Project quality factors

Experience with projects over time has indicated that the long-term success of development projects and the sustainability of project benefits depend on a number of factors, over and above the economic and financial viability of the project.

These factors, summarised in Table 1.3, are particularly relevant to development projects rather than to purely commercial projects.

Table 1.3 Key Quality Factors for the Long-Term Sustainability of Projects

| Quality factor | Description |
|---------------------------------------|---|
| Ownership by beneficiaries | <ul style="list-style-type: none"> • involvement of target groups and beneficiaries in project design • involvement of target groups and beneficiaries in project execution |
| Policy support | <ul style="list-style-type: none"> • quality of the relevant sector policy within a country • commitment of government to continuation of project services after external/donor finance |
| Appropriate technology | <ul style="list-style-type: none"> • whether technologies applied in the project can be maintained in the long run |
| Socio-cultural issues | <ul style="list-style-type: none"> • does the project take account of local cultural norms and attitudes? • do project beneficiary groups have appropriate access to project services and benefits during and after project implementation? |
| Gender equality | <ul style="list-style-type: none"> • how does the project take into account the specific needs and interests of women and men? • is there sustained and equitable access by women and men to services and infrastructure as well as contributing to the reduction of gender inequalities? |
| Environmental protection | <ul style="list-style-type: none"> • the extent to which the project will preserve or damage the environment and therefore support or threaten longer term benefits |
| Institutional and management capacity | <ul style="list-style-type: none"> • the ability and commitment of the project implementation agencies to deliver the project/programme and to continue to provide products and services beyond external finance/donor support |

However, increasingly, commercial projects have to take into account international and national legislation and the pressures of lobbying groups (eg UN agencies, Greenpeace and other development and environmental lobby groups). There have been, for example, particular pressures on mining, oil exploration and dam projects, taking account of the impacts on the environment and local communities (dam projects in Turkey and India; oil exploration projects in Nigeria and other West African countries).

Later in this course you will consider some of the broader issues of project quality when you consider impact assessment, poverty and the political economy of projects, their promoters and financiers.

1.6 The Measurement of Project Performance

The measurement of project or programme performance may be undertaken using quantifiable and non-quantifiable indicators (*performance indicators* or *PIs*). These may be used to compare the project performance with other projects (again, care must be taken to ensure that one is comparing like with like). Performance indicators may be defined during project design and could be taken from the logical framework matrices (observable verifiable

indicators) or they may be defined separately. Some of the financial and economic indicators presented later in Units 2 and 3 produce such performance indicators:

- pay-back period
- return on capital employed
- net present value
- internal rate of return.

PIs are used extensively in project management in the private sector and, increasingly, in the public sector in an attempt to measure performance and improve efficiency. They are applied in many social and economic sectors:

- agricultural production and productivity
- energy production
- manufacturing
- financial services (banking, insurance)
- the health sector
- education
- transport services.

Each sector will require specific performance indicators that are appropriate and relevant to that particular kind of activity. Performance indicators are useful management tools, but it is important that they are developed by management in collaboration with the workforce in order to reduce the possibility of misunderstanding; for example, it is possible for the workforce to consider that indicators may be used to reduce the number of people employed.

Box 1.1 summarises the use of performance indicators.

Box 1.1 Characteristics of Performance Indicators in the Public and Private Sectors

Definition of Performance Indicator = 'Progress towards the achievement of corporate objectives'

Reasons for Performance Indicators

- Cost reduction and more efficient allocation of resources
- Motivation of employees through the use of rewards/incentives
- To maintain organisational competitiveness.

The Main Components of Performance

- Economy – cost reduction without reducing quality
- Efficiency – financial ratio between outputs and inputs
- Effectiveness – the extent to which the objectives have been met.

Three Points for Performance Measurement

- Input Stage – staff, buildings, goods (cost measures)
- Output Stage – service or good that the organisation produces
- Outcome Stage – indirect products of services/production process – such as customer satisfaction, health of community.

However, you should note that performance indicators and other measures of project performance have both strengths and weaknesses, and these are summarised in Box 1.2.

Box 1.2 Strengths and Weaknesses of Performance Indicators in Project Management

Strengths

- Facilitates open discussion of organisation's role, position in the market place easy technique to use
- Indicators readily available from company accounts and financial statements
- Useful supplement to other techniques – for example, financial analysis, cost-benefit and cost effectiveness analysis.

Weaknesses

- Financial measures may be static
 - Manipulation of financial indicators
 - Mechanical interpretation of performance indicators may give the wrong results
 - Subjectivity
 - Data may not be directly comparable
 - Reliability of data source
 - If the management does not have control over what is being measured, there is a problem.
-

Exercise

Take a moment to consider how the performance indicators, as described in Box 1.1, might be used in projects with which you are familiar, and consider the problems that might be associated with applying such indicators.

As you will be able to imagine, there are further issues associated with the application of performance indicators in private and public sector management:

- an overly mechanistic approach to using indicators and other techniques for benchmarking (comparing) project performance against other projects or approaches
- inappropriate indicators
- lack of clarity over who benefits and how
- cost of collecting data and setting up management systems to monitor the data
- subjective nature of some indicators
- the possible omission of other indicators, such as social impacts.

The use of performance indicators or PIs is commonplace within governments. For example, in the United Kingdom PIs are used in the public sector (health, education, research) to assess performance between different institutions (eg universities, municipal authorities, health trusts), and between UK institutions and those in other countries. The World Bank and other international financial institutions use PIs to assess the performance of development projects and programmes. There is a danger that the data and information requirements needed to construct PIs may be expensive and that interpretation may become mechanistic. For example, a company or institution may develop indicators suggesting that performance is satisfactory when there is consumer dissatisfaction or, even worse, where the wrong PIs are collected. An obsession with PIs

may also result in the loss of medium- to long-term strategic vision for the operations of a project or company.

1.7 Summary and Conclusions

The project cycle, stakeholder, problem tree and logical framework analysis are all techniques that aim to ensure the application of a rational planning approach to projects and development programmes. The techniques also aim to set up a framework which allows project managers, policy makers and others involved in project preparation, appraisal, management, monitoring and evaluation to measure (where quantitative indicators are available) or assess (using qualitative indicators) the impacts and success of a project after implementation. While all the techniques presented in this Unit are useful as a framework for evaluation and analysis, you have seen that they should not be applied mechanistically. It is also important that causal relationship and mapping as set out in logical frameworks and problem trees are correctly specified. Establishing direct causal relationships is a particular problem in this respect.

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