

# MODULE 1

## INTRODUCTION

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### 1.1 BACKGROUND

This manual provides advanced training material on natural resource and environmental economics, and policy analysis. It has been prepared to meet the needs of a broad range of users, from policy analysts to academics across a wide spectrum of expertise. The manual has been designed primarily for use in eastern and southern Africa in terms of the case studies and examples, however the theoretical foundations can be applied anywhere.

A healthy environment and well-managed natural resources are critical to sustainable economic and social development in eastern and southern Africa. A high proportion of the regional population live in rural areas and are dependent on natural resources and the environment for basic needs such as food, water and shelter, in addition to earning modest cash incomes.

At a macro-level, most countries rely on the commercial exploitation of biological resources such as forests, fish and soils for a high proportion of national income. Most of the region's natural resources are owned by the State, therefore, formulation and analysis of public policy over natural resources and the environment (so-called "green" issues) is crucial. At the same time, rural-urban migration is increasing in all countries in the region. Many countries are also trying to encourage greater investment in industrial activity as part of a broad economic

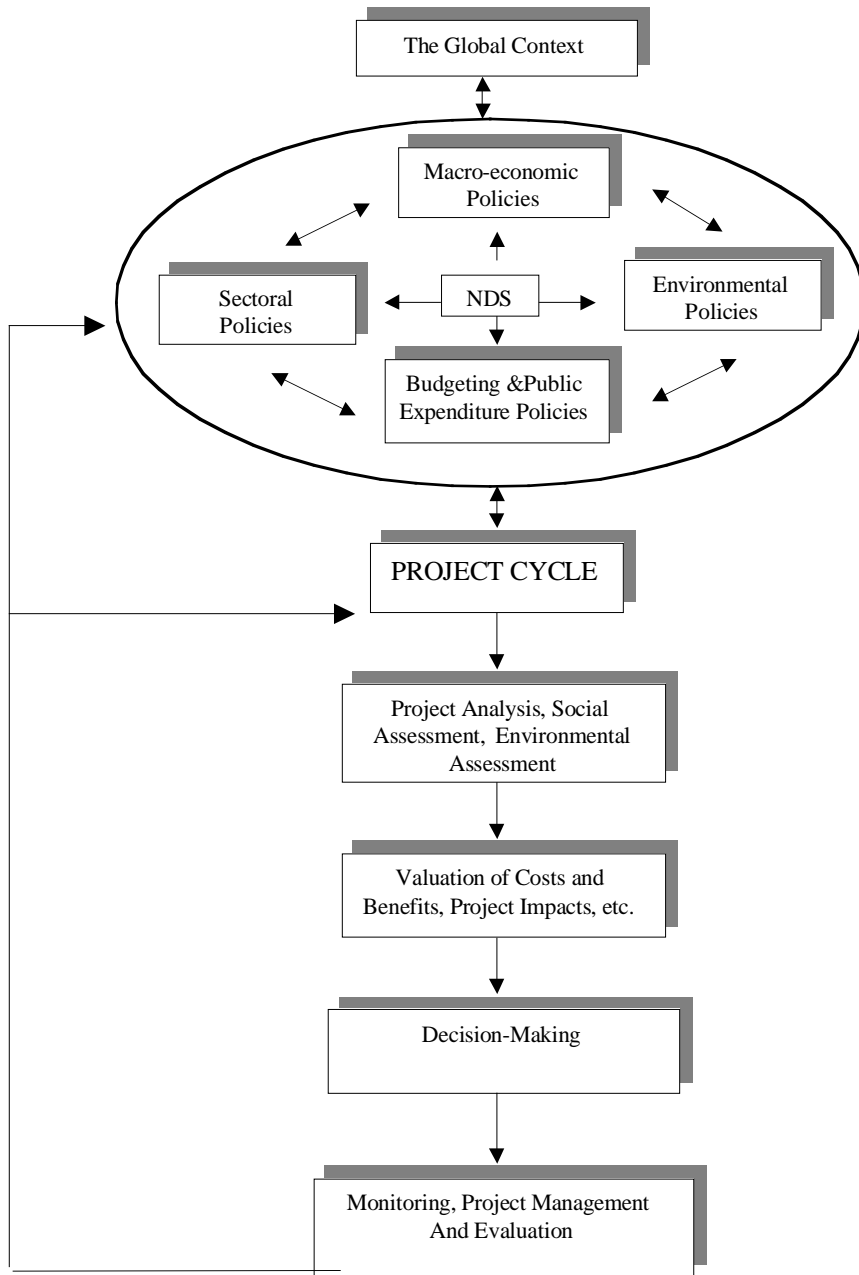
development programme. These changes are placing more urgency on “brown” issues such as air and water pollution. Urban health concerns, ranging from foul air and water, to toxic waste, demand sound policy solutions, often based on economics.

Finally, countries in the region are increasingly becoming part of the global community. Economic reform programmes being implemented by governments are opening up countries to global competition. International economic, sectoral and environmental policy is now an important factor in shaping national policies for economic and social development, and environmental management.

Effective natural resource and environmental policy analysis must therefore account for global, national and local factors and relationships (Figure 1.1). As shown in figure 1.1, a national development strategy (NDS) is shaped by a combination of macro-economic, sectoral and environmental policies, which in themselves are influenced by global policies. For example, most countries in the region have signed and ratified global environmental policy agreements such as Agenda 21 (from the Earth Summit in 1992), which require national commitments to certain actions. The goals and objectives of the “NDS are addressed through institutional frameworks (laws and policies), and programmes/projects funded via the government’s annual budgeting and expenditure process. Sectoral Ministries usually identify, plan and implement specific programmes, comprised of collections of projects.

Project appraisal should encompass economic, social and environmental elements in the decision-making process. Monitoring and evaluation of projects should provide valuable information at the national and sectoral levels to improve the efficiency and effectiveness of future investments of scarce capital.

**Figure 1.1: Global-macro-national-local policy interactions**



## 1.2 STRUCTURE OF THE MANUAL

The manual offers material from three points of view:

- **Economists** who seek to maximise human welfare within the constraints of existing resources and technologies. Economists are becoming more aware of the economic and ecological importance of natural capital such as forests. Valuation of these benefits is fundamental to policy formulation. Therefore, economic analysis is at the core of this manual, but should be recognised as only one source of information for decision-makers.
- **Ecologists** who stress preserving the integrity of ecological subsystems, which are critical for the overall stability of the global ecosystem. Arguments range from the preservation of all ecosystems and reduced economic activity, to maintaining the resiliency and dynamic adaptability of natural life-support systems as economies grow. The ecological accounting units are physical, not monetary, and the prevailing ecological disciplines are biology, geology, chemistry, and the natural sciences. There is a need to value these accounting units where possible.
- **Sociologists** who emphasise people and their patterns of social organisation, which are crucial in devising viable means of attaining sustainable development. Failure to pay sufficient attention to social factors in the development process is seriously jeopardising the effectiveness of various development programs and projects. People must be integrated into policy and project analyses.

Trainers and practitioners can use the manual in any sequence. The material is designed to enrich non-economists yet at the same time, provide sufficient theory to satisfy trained economists. The ten modules in the manual cover the following material:

**Module 2: The Environment and Sustainable Development**

The concept of sustainable development has evolved into a touchstone of policy formulation at global, national and local levels. This module provides detailed material on the economy-environment interface, leading to a theoretical discourse on sustainable development. Various models and conditions for sustainability are reviewed.

**Module 3: Natural Resources and Environmental Degradation in eastern and southern Africa**

This module provides an overview of the state of key natural resources and the environment in the region, using data from the World Resources Institute (1999) and the United Nations Development Programme (1997). Special emphasis is placed on human development and monitoring environmental changes.

**Module 4: Explaining Natural Resource and Environmental Degradation**

The loss of renewable natural resources beyond sustainable limits and general environmental degradation is a serious issue in the region. This module shows how inappropriate economics and policy are contributing to these problems. Two case studies are provided to illustrate the underlying theory.

**Module 5: Natural Resource Economics and Scarcity**

Over the past few decades, a special field of economics has evolved to focus on natural resources. This module provides the basic economic theory surrounding the management of renewable and non-renewable natural resources. Various measures are also reviewed that can help policy-makers understand whether natural resources are becoming scarce, in a physical and economic sense.

**Module 6: Macro-economic Policies, Policy Analysis and the Environment**

Macro-economic policies such as fiscal, monetary and trade, have strong linkages with the environment. Module 4 explains many of these linkages. This module focuses on tools for policy analysis at the macro-level that can help us understand and in some cases quantify the environmental impacts of macro-level policy changes. Three analytical tools are explained and four case studies provided to illustrate examples.

**Module 7: Sectoral Policies, Policy Analysis and the Environment**

National development strategies are usually implemented through sectoral Ministries. This module provides examples of policy analysis and tools that can help formulate more environmentally sustainable policies in the natural resources (green), water (blue) and urban and industrial sectors (brown) sectors. Four case studies illustrate policy analysis for these sectors.

**Module 8: Project Appraisal and the Environment**

Investment projects are often the means of implementing national development strategies. This module provides advanced material on the project cycle, discounting, and methods of appraising projects. Both economic and broader multi-criteria project appraisal methods are reviewed. The decision-making and public participation processes are also examined. The cost-benefit and non-monetary assessment methods can also be applied at the programme and policy levels.

**Module 9: Economic Valuation of Natural Resources and the Environment**

One of the more intractable problems in natural resource and environmental economics is the lack of market values for many goods and services. This module illustrates several valuation methods that can be used to overcome this problem in many policy and project analysis situation. Some of the methods are quite complex and have heavy data requirements, while others are simpler and easier to understand by non-economists. Annexes provide detailed case studies and examples.

**Module 10: Environmental Impact Assessment and Environmental Economics**

Environmental impact assessment (EIA) is the operational end of broader environmental assessment (EA) programmes and policies. Most countries in the region now have EA/EIA policies with various levels of success in implementation. EIA provides a good platform to review the economic, social and environmental impacts of projects and programmes. Strong potential exists to link environmental economics and EIA. This module provides an overview of EIA concepts and tools, plus several case studies of EIA at project, sector and regional levels.

The approach taken in this manual has been “more is better”. It was felt that as much relevant material as possible should be placed in each module. For non-economists, some of the material

may be too advanced, however training courses for this audience can skip over the detailed economic theory and focus on the more practical material, including case studies and examples. Annex 1 on basic macro and microeconomics has been included at the end of the manual to help the non-economists gain more from other modules. Readers with a strong background in economics should be able to tackle all the material in the manual. Mathematics is not entirely absent, but the use of complex calculus to prove economic arguments has been minimised. References are listed in appropriate spots for those economists who wish to pursue the mathematical gymnastics behind the economic theory. More general references are provided at the end of the text to provide useful sources of material for readers who want to learn more about environmental economics and policy.

The material in this manual can easily be applied to courses ranging from one week to one semester, depending on how much detail is needed and the background of the participants. The material could also be used to support distance learning programmes. In this light, Annex 2 at the back of the manual lists useful Internet sites for information on environmental economics, relevant databases, and natural resources. As an example, the WBI now has their entire training kit (from which much of this material was derived) on-line, which can be downloaded free of charge. The list of relevant Internet sites can be updated regularly. Regional organisations and networks may also consider adding environmental economics links to their own web sites.

It is hoped this manual will stimulate professionals from various fields to journey further down the environmental economics road and share this material along the way:

*If you have knowledge, let others light their candles at it.*

(Thomas Fuller 1608-61)

One final note. Some boxes and some tables use a slightly smaller font than the regular text. This was done to fit larger boxes and tables into one page, distinguish these features from the regular text and more importantly, shorten the manual to reduce future paper and copying costs for the user.