MODULE 3.1

Methods of Preparing Verifiable Environmental Impact Statements (EIS)

M. Ghimire and B. Upreti

Objectives

- To describe an environmental assessment process for watershed programmes with emphasis on how to conduct assessment and prepare an EIS or an assessment report with a participatory approach
- To outline the steps for environmental assessment where local people have an opportunity to participate from the planning stage to its implementation and monitoring
- To consider the role of local people in developing and implementing the EIS to manage and utilise their watershed resources on a sustainable basis and to highlight the benefits of preparing an EIA through a participatory approach

Definitions

The environmental impact statement (EIS) is a document written in a format prescribed by law or terms of reference (TOR). It contains a summary of the environmental inventory and the findings of the environmental assessment and is presented to decision-makers. It may also be opened to the public.

The EIS is also called an environmental statement, impact statement or environmental impact assessment. The environmental impact assessment (EIA) is to identify, predict, interpret and communicate information about the environmental impact of an action. Information and findings of the EIA are put into the EIS report. As in many other reports, the EIS report is prepared in two stages as a draft statement and final statement. The draft statements after review by the competent authority and the public, as applicable, are made final.

Why is EIA needed?

Watersheds experience increasing environmental degradation because of development activities. Such degradation is a major concern for the people both in the mountains and the plains. Mountain people experience the problems of increased soil loss and landslides while the people living in the plains are affected by deposition of unproductive soil on productive farmland. The source of the problem, by and large, is human activity in the watersheds.

Preparation of the EIS for a (watershed) development project largely facilitates the concerned organization to design actions holistically. A good EIS is prepared through a participatory process. People's participation has contributed to selecting and implementing programmes with intensive interaction among stakeholders. To this end, preparation and implementation of the EIS contributes to resource management and improves the quality of life of local people living in the watersheds. In this process, all the stakeholders are actively involved: the stakeholders' concerns are adequately accommodated, and the stakeholders implement the EIS. In sum, an EIS is prepared to ensure that watershed management activities address environmental concerns adequately and that the local people are fully involved in the management.

The EIS must integrate environment and development; but this integration is not that simple. A sectoral outlook that attempts to accomplish the targets generally guides the development process. However, the environment is a multi-disciplinary and multi-sectoral subject. Significant environmental effects of development actions are both direct and indirect.

What are the important dimensions of EIA?

A systematic procedure for the EIA should be introduced into the project cycle before implementation (Figure 1).

The EIA deals with methodologies and techniques of planning, environmental analysis and management of project proposals. The EIA provides the relevant

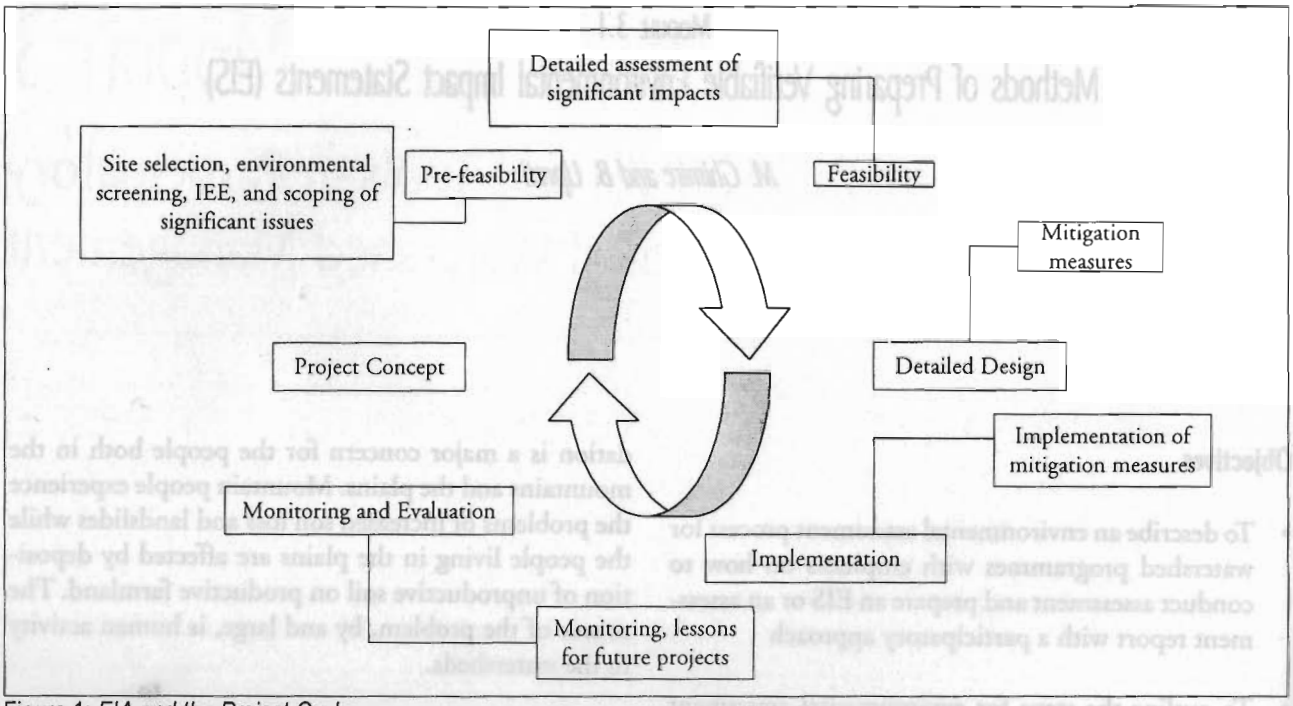

Figure 1: *EIA and the Project Cycle*

stakeholders with details about assessing and mitigating the environmental impacts of actions proposed. The EIA (and the EIS) influences the decision-making process at various levels. It is used to

- identify likely impacts of the proposed action on the environment,
- analyse, predict and evaluate the significance of the impacts and present options for decision-makers,
- provide corrective and preventive measures to each adverse impact,
- provide measures to augment beneficial impacts,
- recommend a monitoring and evaluation system including indicators, methods and responsible agencies during project implementation,
- provide information on the framework of environmental auditing, and
- recommend whether the proposed action should be implemented and in what form.

Types and topics of assessment reports

Different types of impact analyses are carried out at different levels. At the project level, detailed impact analysis is done through an EIA; at the regional level, a regional environmental assessment (REA) is carried out to assess cumulative impacts; and at the programme and policy levels, a strategic environmental assessment (SEA) is done as a new generation of the EIA.

The environmental analysis contains a description of the environmental impacts of the proposed action. The EIS should also contain a list of, primarily, negative impacts that cannot be avoided during the project implementation. It should recommend whether the project should be implemented even if the impacts are unavoidable.

The EIS should focus on the possible alternatives and the likely environmental impacts of each alternative. It should also focus on short-term needs and enhancement of long-term productivity. Adequate attention should be given to future options if there is a possibility of removal of resources.

If these issues are addressed, then the EIS will be considered as reasonably pragmatic.

Environmental Impact Analysis: Process and Decision-Making

The proponent or the approving agency should screen the proposal to understand the level of environmental assessment required. The screening activity helps divide the actions proposed into the following categories

- project clearly requiring an EIA,

- project not requiring an EIA, and
- need for an EIA is not clear.

In Nepal, for example, according to the Environment Protection Rules 1997, an initial environmental examination is required for a watershed management plan. However, there could be many more sectoral projects implemented in, and/or passed through, the watershed area. These projects should also undergo screening for impact assessment. If it is unclear, it is appropriate to screen the project as in Figure 2.

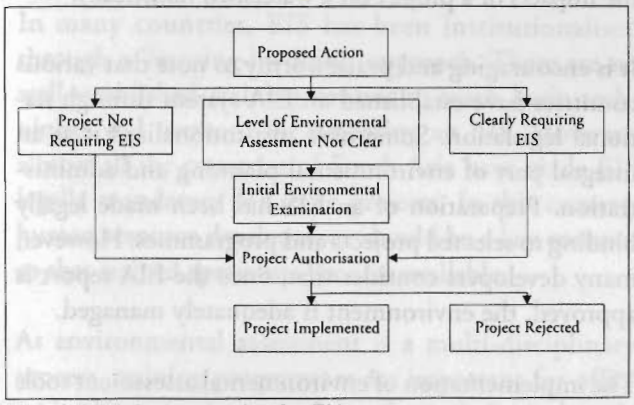

Figure 2: *Project screening for EIA*

The second step of the environmental assessment is to appreciate the scope of the study: often called scoping. This step helps identify issues and areas to be covered by the study. A plan for public involvement is made, relevant information collected, and a public notice for the attention of people likely to be affected by the proposed action is issued. Scoping identifies major issues of public concern, evaluates the seriousness of issues raised, sets a priority on the issues, and develops a strategy for addressing the priority issues. The scoping report leads to the development of the terms of reference (TOR) to guide the preparation of the EIA or the EIS. The EIA should also contain a framework for environmental audit. The detailed process of EIA report preparation is given in Figure 3.

The environmental assessment exercise requires a multidisciplinary team of experts. As set out in the TOR, various impacts—biophysical and socioeconomic—should be identified. The impacts should be rated as direct, indirect or cumulative, and as of a reversible or irreversible nature. Various methods, such as checklists, matrices, networks, overlays, etc, can be employed. Mathematical models (cause-effect relationship), statistical models (data-hypothesis relationship), geographic models (possible effect of project on resources), field experiments, and expert judgement are also used to assess the impacts and prepare the EIS (IUCN 1997).

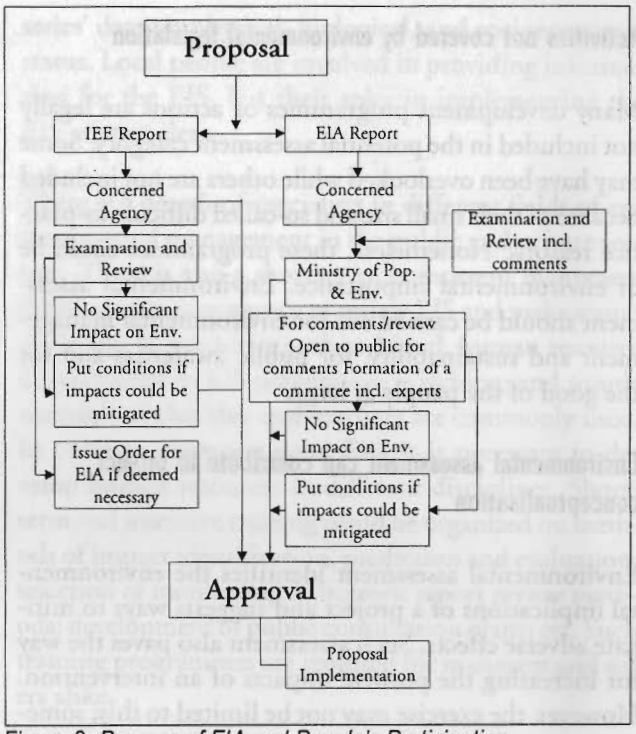

Figure 3: *Process of EIA and People's Participation*

During the assessment process, local people are directly or indirectly involved in furnishing information to the reporting team. Once the report is prepared it should be made public to encourage people's advice, suggestions and comments.

Nepalese Legislation

In Nepal, the Environment Protection Act 1996 (EPR) and Environment Protection Rules 1997 (EPR) require a scoping report by the proponent for all proposals as mentioned in the legislation (HMG 1997). The proponent is required to issue a 30-day public notice regarding the nature of the proposed action for a particular area. The people may submit their concerns or issues to be included in the terms of reference and addressed during the study. All such issues should be well documented in the scoping report.

The legislation also has provision for penalties. A maximum penalty of NRs 100,000 (approx. US$ 1,500; US$ 1 = NRs 67.35, Dec 1998) may be imposed on anyone who implements a project requiring environmental assessment without approval of its environmental report. In this case, the Designated Officer may also issue an order to stop the project activity immediately. The legislation has also a provision for Environmental Inspectors to inspect and report on proposal implementation.

Activities not covered by environmental legislation

Many development programmes or actions are legally not included in the potential assessment category. Some may have been overlooked while others are not included because of their small size and so-called difficult-in-practice reasons. Nonetheless, these programmes could be of environmental importance. Environmental assessment should be carried out for environmental management and sustainability, for public awareness and for the good of the people at large.

Environmental assessment can contribute to project conceptualisation

Environmental assessment identifies the environmental implications of a project and suggests ways to mitigate adverse effects. Such assessment also paves the way for increasing the positive impacts of an intervention. However, the exercise may not be limited to this; sometimes it creates a situation that allows for the development of a new project concept. An example in Nepal is presented in Box 1.

Main lessons

A number of countries prepare EIS prior to the approval of proposed actions in order to inform decision-makers and the public on likely environmental impacts. Environmental assessment studies help in the preparation of EIS. Generally, they overlook the impacts of macro-level policy, plans and programmes. An assessment of cumulative impacts is usually outside the scope of the project-level EIAs; these EIAs focus on project-specific impacts. However, a higher level of environmental assessment, such as an EIS, opens opportunities for integration of environmental aspects in development proposals, assesses cumulative impacts, focusses on maintaining a chosen level of environmental quality, and creates a framework for measuring impacts and benefits of environmental improvement activities (IUCN 1997). It is important to see the impacts of a project on a watershed holistically.

It is encouraging and praiseworthy to note that various countries have established an EIA system through national legislation. Some have institutionalised it as an integral part of environmental planning and administration. Preparation of an EIS has been made legally binding to selected projects and programmes. However, many developers consider that, once the EIA report is approved, the environment is adequately managed.

The implementation of environmental assessment tools has been limited due to the weak institutional capacity for enforcement. This includes inadequately trained human resources, a lack of information dissemination and database systems, and a lack of procedures and criteria for reviewing assessment reports and for integrating rec-

Box 1

EIA study that changed the project concept

In the mid-1980s, a scheme was designed to irrigate about 5,300 ha of the northern part of Tandi and Bhandara, Chitwan District, in the central Terai. The southern part of the project area had a well-established farmer-managed irrigation scheme. The plan was to divert water from the East Rapti River. This river runs through the Royal Chitwan National Park located south of the proposed site. The National Park was established in 1973 and is home to a number of protected wild animals. In 1984 it was included in the UNESCO World Heritage List. The river provides an aquatic habitat for 44 species of fish and is a perennial water source for grassland mammals.

The highest average discharge rate of the Rapti River was estimated to be 180 m^3/sec in August during the monsoon with a dry-season average flow of 17.4 m^3/sec and a mean annual flow of 62 m^3/sec. The project was designed to provide a 400m–long diversion weir across the Rapti River to divert a maximum flow of 14.3 m^3/sec. An under sluice, guide banks and a 3.7m–wide fish ladder was proposed for construction. Similarly a self-flushing de-sander, 21.9 km of canal networks and 24.6 km of drainage networks were also designed to protect the river bank and distribute the water.

After the project design was completed, the National Park authority and NGOs raised the question of environmental impact. The proponent then conducted an EIA study. The study identified, predicted and evaluated the likely environmental impacts of the diversion of water for irrigation during the dry season. The project was likely to affect flora and fauna including rare and endangered animals, income generation from eco-tourism in the park, and cause possible contamination downstream from chemical fertilizers and pesticides.

The EIA study concluded that the project should not be implemented as envisaged and that the farmer-managed irrigation scheme should be strengthened. The study further concluded that the recharge of the river downstream should be monitored for at least two years. The EIA changed the project concept and reformulated the project.

ommendations into project design and contract documents. Also, mechanisms for public consultation and for monitoring and evaluation are grossly inadequate. The responsibilities of non-governmental and private organizations, affected people, business communities, academicians, professionals, and politicians should be counted on to strengthen this system. Other ingredients such as education, research, professional development, etc are equally important for preparing an EIS and implementing it more effectively.

Future directions

In many countries, EIS has been institutionalised through a 'learning-by-doing' approach. There are no well-established training centres to teach basic techniques and methods for preparing an EIS. However, almost all the countries of South Asia have made EIS legally mandatory for some projects. In this context, human resource development should be a key concern so that trained specialists become available.

As environmental assessment is a multi-disciplinary process, training programmes are important for officers in the approving agencies and people from the private and public sectors. Since environmental management is a rapidly growing area, the people concerned must be exposed to recent research and development on environmental assessment. Furthermore, education, training and extension programmes for local people are important if the assessment is to be realistic, implementable, far reaching, and effective.

Conclusion and recommendations

Watershed management activities are generally environment-friendly. The impacts of other sectoral projects and programmes implemented in the watershed areas are generally overlooked in such activities. The watershed area should be considered as a development unit, and an EIS should be prepared with people's participation prior to the implementation of any development programmes. This process will provide a basis for identifying the cumulative impacts of programmes and ensuring intersectoral co-ordination during programme implementation. This will also help to assign the responsibilities of each development partner involved in watershed management.

Preparation of an EIS is a legal requirement in many countries. EIA reports are generally prepared at project level, and cumulative impacts of the proposed action are, in most cases, overlooked. EIA reports are prepared on a value-judgement basis because of the lack of time-series' data on physical, biological, and socioeconomic status. Local people are involved in providing information for the EIS, but their roles in implementing the EIS are not clear.

There is a dearth of specialists in different fields of environmental management in the public and private sectors. There is also a shortage of competent manpower in the government agency to review EIS and make sound decisions. In countries such as Nepal, human resource development in EIS preparation is lacking, and simple methods of checklist and matrices are commonly used. In order to prepare a good EIS, it is necessary to develop human resources in different disciplines. Short-term and intensive training could be organized on methods of impact identification, prediction and evaluation; selection of monitoring indicators; report review methods; development of public consultation plans; etc. Such training programmes are required for managers and users alike.

Environmental effects of small but collectively significant programmes are generally not assessed. Such assessments should be made for environmental and sustainability reasons, if not for legal obligations. Simple guidelines for conducting such studies are needed. Mass awareness about environmental effects of development programmes on watersheds is needed.

A myth prevails that the environment is managed once the EIS is prepared. There are weak or no institutionalised monitoring and evaluation systems, and use of monitored information in programme design and future planning is also lacking.

The EIS provides a basis for linking different development programmes within a watershed area. The statement helps to manage the resources and deal with the environmental impacts of development. The EIS should be integrated into watershed development planning not only in its preparation but also in its implementation and evaluation. A good EIS report ensures local people's participation and the involvement of all stakeholders.

References and further reading (not necessarily cited in the text)

Canter, L.W., 1977. *Environmental Impact Assessment.* New York, USA: McGraw-Hill Book Company.

HMG, 1993. *National Environmental Impact Assessment Guidelines.* Nepal Gazette. Kathmandu, Nepal: Govt. Press.

HMG, 1997. *Environmental Protection Rules*. Nepal Gazette # 47 (Additional 15). Kathmandu, Nepal: Govt. Press.

IUCN, 1997. *Strategic Plan for Strengthening EIA in South Asia (draft)*. Kathmandu, Nepal: IUCN.