A GUIDE TO THE PRACTICE OF ENVIRONMENTAL IMPACT ASSESSMENT IN THE SOUTH PACIFIC REGION

Notes for a course
given by the
South Pacific Regional Environment Programme

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January, 1993

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THE PURPOSE OF THIS BOOKLET

To explain the meaning of **Environmental Impact Assessment (EIA)**, and to explain the contents of an EIA document.

To explain the value and importance of **EIA** in relation to government decisions about development, and

To assist in the development and implementation of effective **EIA** procedures in the South Pacific region.

To provide useful background material and references for conducting and reviewing **EIAs.**

WHAT IS EIA?

Environmental Impact Assessment is a process to determine the effects a development project will have on the natural and human environment.

EIA is a part of project management, like engineering design, economic assessment, and market research. The goal of an EIA is to predict how a development project will effect its environment, and to make recommendations to minimize the negative effects.

(In addition to development projects, *government policies* can also be subject to an EIA. For example, if a government wants to establish tax-free zones to encourage industry, it can undertake an EIA to investigate the environmental and social consequences of the policy.)

Environmental assessment as a management tool:

In developing a proposal for a resort, there has always been:
engineering assessment (will the resort fall down in the first cyclone?)
economic assessment (will I go broke if I build this resort?)
market assessment (will anyone come to the resort if I build it?)

but there has not always been:
environmental assessment (will my resort spoil the beach, lower the water table, or upset the nearest landowners?).

WHY DO EIAs?

Because of international requirements

After decades of experience with projects that produce unwanted environmental and social consequences, most international loan and aid funding organisations now require EIAs for projects which they fund. This includes the World Bank, the Asian Development Bank, British aid, Australian aid, New Zealand aid, EEC aid, and U.S. Aid. Some aid agencies, such as those of China and Korea, still do not require EIAs.

Because EIAs are a good management tool

EIAs can prevent embarrassing development failures, and can save both government and industry a great deal of money. Environmental management is especially important in the South Pacific island countries where there is not a lot of land or resources with which to make mistakes.

In 1985, the Fiji's Housing Authority decided to establish a low income housing area at Davuilevu near Suva. Since statutory bodies are not subject to EIA in Fiji, no attempt was made to determine the environmental effects.

An area of 20 hectares of rainforest was bulldozed and divided into suburban lots. Seven years later, most of the plots are unoccupied, and the area is a wasteland of eroded bare soil. The soil was so seriously disturbed that nothing has grown since. An EIA would have pointed out the lack of wisdom in removing all the forest cover over such a wide area.

To provide a mechanism for consulting people who will be affected

EIAs provide a formalised way of consulting the people who will be affected by a development before it happens. Such consultation helps avoid unwanted social and environmental effects that are not obvious to the developers and to the decision-makers in government.

Because the world is changing too fast

The introduction of new technology, and the opening up of societies to permit participation in the global economy, have brought major changes to the pace and extent of resource development and exploitation in the South Pacific. Natural resources are being used in much greater quantities than previously, with the use of totally different technology, and produce is being exported rather than being used by the local population. One important consequence of this new pace of development is that the previous "trial-and-error" process of human adjustment to the environment is no longer appropriate.

As has been seen in many countries in Europe, North American and Asia, severe environmental problems can be caused in a very short time. The scale

and speed of the developments mean that serious harm can be done before the problem is even recognised. EIAs are a means of predicting and controlling undesirable consequences of rapid development.

Examples of modern technologies effecting the South Pacific environment:

Driftnet fishing techniques;
Tuna fishing using helicopters and catching tuna 'on dolphins';
Night hunting of flying foxes in Western Samoa with shotguns and spotlights;
Using scuba gear for giant clam and trochus collection;
Using spearguns and underwater lights for spearing reef fish at night;
Dynamite fishing;
Clearcut logging.

HISTORY OF EIA

EIA was formally introduced in the USA in 1970 to examine the environmental implications of federally-funded projects. The procedure has spread around the world, in various versions and adaptations.

Originally, EIAs were used to predict the potential environmental changes likely to occur if a proposed project went ahead. The intention was that EIA would be used to alter designs, or sites, to minimise unacceptable changes in the environment.

More recently, EIA has expanded in scope to include the social effects of a development. EIAs now usually have a section on the human environment, and address the question of who will benefit and who will suffer from a development. They usually include evidence of public meetings or other consultative processes, and report on the opinions of the affected people.

And most recently, the scope of EIAs have expanded again, to address the issue of the 1990s: can the project be termed a sustainable development?

EIAs in the United States: A Rough History

In the 1970s, EIAs were often very long and boring documents, several volumes in length, dealing in great detail with every possible effect the development could have on the natural world. An EIA might take two years to finish, cost $1,000,000, and be done by a team of very specialised government scientists who seldom spoke to each other. Often the EIA would be used as a means of doing original research, and then the conclusion of the EIA was only that more research was required before the environmental impacts could be fully understood.

These early EIAs were a painful process for administrators and developers, and everyone did their best to avoid having to go through the EIA process. The complaints were that the process was slow, expensive, had very little to do with what was important to people, and that the result was something that was not useful in helping make a decision about the project. In some states it was actually necessary to introduce regulations limiting the number of pages in an EIA document to make them more readable.

In the 1980s, EIAs started to improve in their speed and readability, and to get a somewhat better name as a management tool. Once they started to include social effects, and include public hearings and public comment, the approval ratings of EIAs increased dramatically. This information was genuinely useful to decision-makers and politicians.

By the late 1980s, EIAs were no longer being done by poorly co-ordinated groups of government scientists: they were being done instead by the developer, and only reviewed by the government. Their speed had increased, and their cost had decreased, dramatically. It is now reasonable to get an EIA done on a small project for $10,000 in 10 days.

In the 1990s the EIA process is well accepted and widely practiced. As the number of EIAs has increased, it has become much easier to scope, conduct, report and obtain a decision.

EIA AND SUSTAINABLE DEVELOPMENT

The term 'sustainable development' has recently become a central concept in the planning process in many national economies around the world.

Sustainable development refers to using resources in such a way that renewable resources (for example fish, forests, etc) have the chance to replenish themselves; and non-renewable resources (for example, minerals) are depleted in a managed way to allow the economic and social system to adjust to the end of the resource.

In the Pacific island nations, traditional societies learned to live in balance with nature through long-term, trial-and-error processes. Pacific island societies have altered the natural environment (for example by clearing land or by importing new species) but they achieved a new settled relationship with their environment. This is the goal of sustainable development.

New rapid pace of modern development has threatened this balance with nature. EIA provides a means of controlling development, and determining if it is sustainable before the development begins.

Sandalwood exploitation and sustainable development:

In the early 1800s, it only took about twenty years for Europeans to completely exploit sandalwood. Sandalwood is now virtually extinct. In modern times, an EIA would be performed, and it would determine the rate at which the sandalwood could be exploited without destroying the resource. So, if it takes 70 years for a sandalwood tree to grow to maturity, an EIA would suggest that one/seventieth of the trees could be removed each year. That way there would always be sandalwood trees, and there would still be a sandalwood industry.

THE CONTENTS OF AN EIA DOCUMENT

EIA documents follow a relatively standard format. The following is a list of the subjects covered and the order in which they are commonly presented:

Engineering Description of the Project

The first section of the EIA should summarise the nature of the project that is being proposed, including the following:

A clear description of the project with enough engineering information for the reader to determine the likely effects on the environment, including main construction techniques,transportation and other logistics which may cause effects away from the project site.

The management structure for the project - who is in charge (the developer), who is the engineering consultant, the names of other consultants.

The projected time scale for the development: what approvals have been obtained, when construction would start, when it would be complete.

A map showing the location of the project and drawings showing what is proposed.

Description of the Existing Environment

This section describes the environment before the impact of the project:

Climate in the area (including incidence of cyclones);
Landuse (agricultural, industrial, not used, etc);
Foreshore description (including information on waves);
Biological information (flora and fauna on the land and the near shore, including especially anything unique or special);
Social information (who owns the land, nearby villages, local customs and type of work, main source of income);
Cultural heritage (any historical or culturally significant features about the proposed site).

Resources Required by the Project

An examination of the resources that will be required, and where they will come from. This section needs to be divided into two sections: the resources required during the construction project, and the resources required during the normal

operation of the development. The resources required for normal operation need to be examined for their `sustainability'.

Effect on other users of the resources

The purpose here is to examine if the resources to be used by the project will deplete resources that other users depend upon. For example, a resort on an atoll might well use too much water from the groundwater lens and cause a shortage of water for everyone. A cement plant might require sand resources that are already in tight demand for existing construction activities.

Sustainablity

This is were the sustainability of the project needs to be discussed. How long can the resources be expected to last? How long can the project be expected to function? If the project is fisheries or forestry related, is the fishing or logging sustainable, or will it exhaust the resource?

Waste Produced by the Project

If a project consumes resources, then it must almost certainly produce waste. The waste will usually lead to water or air pollution, to solid waste disposal, and to generation of noise.

Water pollution:

A summary of the type and quantity of effluent that will be produced, the effluent treatment that will be installed, and where the effluent will go. A discussion of the effect this waste will have on the receiving water quality. This section can be technical. See the section on Conducting EIAs for some more guidance on what to expect in an EIA with regard to water pollution.

Air pollution:

A description of any air pollution that will be produced. Air pollution can be divided into broad categories: smell (fish plants), smoke (coal burning), dust (cement plants), toxic gases (industrial processes), exhaust fumes (diesel generators). Air pollution is not a widespread problem in the South Pacific. The region arguably has the best air quality in the world, but air pollution can be a localised problem. For example, the Lami cement plant near Suva has been the subject of complaints for ten years because of the dust it generates, which settles on nearby houses, cars, gardens, etc. The Suva bus companies generate clouds of diesel smoke that make the roads black with soot at rush hour.

Solid waste:

A summary of the garbage, and other solid or hazardous waste that will be produced. How will it be handled, and where will it go. If it is to go in the municipal tip, how much will it add to the waste disposal problems of the

municipality. In virtually every country in the South Pacific region, solid waste is disposal is a problem. Municipal tips are usually underfunded and overworked. Any development should be appropriately taxed or feed to cover the real costs of disposal of solid waste.

Noise:

Airstrips, roads, sawmills and so on can generate enough noise to disturb the life of towns and villages, scare away wildlife, and so on. This topic should be covered for projects which can be expected to generate significant noise.

Changes in Land Use

Most development projects require a change in land use. This section should describe how much land will be affected by the project, both in its construction phase and in its operational phase. In the South Pacific there is much less crown land than in most other countries, and landowners jealously guard their rights. Often there is a separate mechanism for dealing with land rights, leases, etc. (In Fiji this is done through the Native Lands Trust Board). If this is so, the EIA can be brief in this section. Nevertheless, the EIA should state the land use change that will occur, and the approval steps that have or will be taken to get approval from the landowners.

Changes in Foreshore Uses

Because of the island nature of South Pacific countries, projects often involve construction on the foreshore. Many countries have mechanisms in place to deal with loss of fishing rights. If this is so, then the EIA need only be very brief in this section, but a description of the foreshore changes and the status of the required permit still needs to be included.

Effects on the Natural Environment

An EIA should explain the effects that the development will have on the natural environment: these are often termed the physical and biological effects of the development. The most common biological effect is the loss of plant species or animal habitat that is unusual or special or protected. If only a small part of an animal's habitat or a plant species range is being effected, then this is a small problem. However, if most of the range is being affected, then the effect is major, and a decision will be required to regarding the value of the biological resource: should mitigation of the effects be required (see below), should an alternate site be considered, is the biological effect sufficiently serious to warrant changing or cancelling the development plan.

The EIA for Vatulele resort in Fiji noted that the resort is adjacent to a very unique red prawn breeding cave, and suggested that the proposed resort take special precautions to ensure that the cave not be disturbed by excessive scuba diving visits or other fishing. By following these guidelines, the resort has been able to make the cave into a tourist attraction without disturbing the red prawns.

Effects on the Human Environment

Effects on the human environment are often termed 'social effects'. The study of the social effects of a development is often the weakest portion of environmental assessments. This is unfortunate. It does not make much sense to expend a great deal of energy listing all species in a certain area, and have no consideration of the people that live there. But many EIAs do exactly that. For example, the Vatulele resort EIA in Fiji has a listing of all species on the island and in the foreshore waters, but hardly a mention of the people living on the island. Even though they were one of the last two remaining villages who knew how to make tapa cloth, this was not mentioned in the EIA.

The key question that this section must answer is: who will benefit and by how much; and who will suffer, and by how much? The discrepancies between who benefits and who suffers are where the problems begin.

Discussion of who benefits and who suffers should cover the following points:

- who owns the project?
- who will work on construction?
- who will work at the completed project:
  - local people or outsiders?
  - women or men?
- what effect can the project be expected to have on community health standards?
- will the project change existing social patterns such as:
  - food gathering?
  - access to beaches or reefs?
  - creating dependence instead of independence?
- will the project result in any training?
- will the project give long-term benefits and jobs?
- will compensation be given to people who are adversely affected?
- will the project cause more `urban drift'?

In order to determine the answers to these questions, public consultation will often be necessary.

Consultation

Consultation with landowners, chiefs or District Officers is important to establish the opinion of those in authority on the impacts of the project. However, consultation with leaders is not necessarily sufficient. Other groups such as lease-hold farmers may need to be involved in an EIA if their livelihoods will be affected. Ideally, all groups likely to be effected deserve the right to be informed and offer opinions on the possible effects of the project on their lives. This most definitely includes Non-Governmental Organisations (NGOs).

The World Bank, after decades of ignoring inconsequential people and NGOs, and paying for it later in social catastrophes, now requires EIAs with hard evidence of who in the community, and which NGOs, have been consulted.

Cultural or Heritage Issues

This section should also deal with any cultural or historical values that will be affected by the project. These include destruction of tabu sites, graveyards, traditional areas, etc.

Social Effects of the Bougainville Mine

Although the Bougainville mine generated enormous wealth, providing about 30% of the tax revenue of the government of Papua New Guinea, the distribution of benefits from the mine did not offset the negative effects for many locals. The mine became of focus of discontent, leading eventually to civil war. A skilfully performed social impact assessment, with more careful attention to the flow of benefits from the mine might have prevented this social and economic calamity.

Mitigation, Alternatives, and Compensation

This section of the EIA document deals specifically with how the development will reduce or compensate for its negative effects on the natural or human environment (assuming that there are negative effects).

Mitigation

This section of the EIA specifies any mitigating measures that will be a part of the project to reduce its environmental impact. For example, if a new brewery is proposed which will produce a lot of water pollution, then a waste treatment plant is a mitigating measure that will reduce the pollution.

Some Examples of Mitigation

In British Columbia, Canada, marsh land has been continually used for development, much like mangrove is constantly being used in the South Pacific. With marsh land becoming very scarce, the government now required developers who affect even a very small area of marsh land to create an equivalent or greater amount of marshland elsewhere.

In Western Samoa the Afulilo hydro project has eliminated much of the country's swamp land, so the project included a phase to protect the remaining swampland in park status. Funds were set aside to protect this area so that the remaining habitat will not be lost.

In the Solomon Islands, the proposed Koromindi hydro project will flood some rainforest area, and the road to the hydro site will open up much more rainforest to exploitation. To avoid the loss of too much rainforest, the proposed project includes substantial funds ($670,000) to set up a reserve area in the rainforest above the reservoir.

Alternatives

If there are serious environmental effects that cannot be reduced through mitigating measures, then the alternatives to the project should be explained, and reasons given why the present project has been chosen.

Compensation

Compensation refers to payment for environmental damage. If environmental damage cannot be avoided, then the people affected may be entitled to compensation. For example, compensation for loss of fishing rights is common in the South Pacific.

The government may insist on other forms of compensation, such as:

- public access to a beach in a resort development,
- improved roads for the community,
- electrical power to the public,
- improved local schools and clinics.
- creating protected areas to make up for ecosystem destruction

International Environmental Treaties, Protocols, etc.

As global environmental problems such as ozone depletion, climate change, and acid rain have become evident, it has become common to put brief sections in EIAs discussing the relationship of the project to these problems, and to international obligations that the country has undertaken. In South Pacific EIAs, acid rain and ozone depletion are seldom mentioned, since they are not problems as yet in the region. However, there is frequently a paragraph on climate change, dealing with the issue of sea level rise, which is commonly estimated at about 1 meter over the next 100 years. This section may point out how the development is sited so as to avoid being flooded by sea level rise in the foreseeable future, or it may deal with the contribution of the project to the greenhouse gas build-up that is behind the climate change problem.

Climate Change and EIA: Looking Ahead

It may be necessary for future EIAs to have a section dealing with the project's expected contribution to carbon dioxide in the atmosphere. Projects which add carbon dioxide may be subject to a carbon tax, and those that reduce carbon dioxide may obtain tax credits or subsidies from international funds.

Cost-Benefit Analysis

Sometimes a cost-benefit economic analysis is included in an EIA. The cost-benefit analysis attempts to put a price on the social costs associated with the project, and the social benefits. This technique can be very useful, but it is difficult to work out the economic cost of something like pollution of a river. An EIA officer should beware of the things that have been left out or undervalued in a cost-benefit analysis.

Cost-Benefit Analysis of Reclaiming Mangrove:

In a much quoted analysis of the wisdom of reclaiming mangrove for rice paddies at the Dreketi rice growing area on Vanua Levu, Fiji, Ms. Lal of the East-West Centre estimated the value of a hectare of mangrove at $2900F/year of which $2700 was attributed to the `off-site' fishery, and $200 to the `on-site' forestry values. Since most of the reclaimed land was too saline for effective rice production, Ms. Lal's thesis is that the land was more valuable left as mangrove, than as marginal rice paddies.

Recommendations and Conclusions

Since an EIA is a decision-making document, it needs a final section that clearly states the main recommendations and conclusions, so that a reader can immediately grasp the main issues.

SOME COMMON QUESTIONS ABOUT EIAs

Who Pays?

The most successful arrangement for paying for an EIA is that the developer pays. The developer is told the 'scope' of the EIA which he must prepare by a government official, and then the developer must cover the cost of the EIA. If the developer is a government department, then that department must allocate the funds for the EIA.

How Much Does an EIA Cost?

The minimum that an EIA will cost, if done by consultants, is about $3000 US, no matter how small the project. For very large developments with complex EIA requirements, such as major resorts, fish processing plants, etc, EIAs cost about $100,000 US. So this is the normal range of EIA costs. The average cost for an EIA in Fiji, based on about 25 EIAs done over the last two years, would be about $10,000 US. In rare cases, such as open-pit mines, extensive baseline studies and other unusual requirements might push the cost of an EIA considerably higher. As a portion of development costs, the costs of an EIA are seldom significant, but they are an `upfront' cost that has to be paid for in the planning stages. This can pose problems for the small developer.

Example Costs of EIAs

The following are approximate costs of EIAs conducted in the last two years in 1993 US Dollars.

SavuSavu Marina	$11,000
Vuda Marina	$11,000
Vatuele Resort	$4,000
Tavua Tailing Disposal	$35,000
Valani Resort	$14,000
Forestry Concession	$75,000
Korotoga Highway Bypass	$20,000
Commercial Centre, Niue	$2,000

How long does an EIA take to do?

Again, based on the Fiji experience to date, an average size EIA for a modest project (development of a marina, for example) takes about two months to complete. A larger EIA such as the EIA for the Denarau resort project in Fiji, takes from six months to a year.

Who does the EIA?

The most common method of getting EIAs done is by using consultants. The key reason for using consultants instead of government staff is that the cost, time of delivery, and terms of reference of the EIA can be tightly controlled, and the performance monitored. A list of possible consultants is included at the end of the brochure, but in general each country should nurture its own local expertise.

How is Bias Controlled?

Since most EIAs are done by consultants hired by the proponent, there is an obvious pro-development bias. This raises questions about the reliability and objectivity of the EIA. However, experience shows that as long as the EIA process is kept open for public scrutiny, most studies are carried out in a reasonable manner, and any remaining bias can be dealt with in the review process. In general, consultants fear for their reputation, and will not let developers influence their opinions too severely. Furthermore, most developers have some self-interest in avoiding environmental damage, even if only for liability reasons.

How Often is a Project Cancelled because of EIA Findings?

Internationally it is rare to cancel a project because of an EIA report. Usually bad projects get screened out at the earlier stage when scoping is done, and the proponent is told that the project is unlikely to survive. However, there are examples. More commonly, EIAs result in changes to a proposed development to try to minimise environmental effects. As long as the EIA is done before planning has gone too far, such changes can be very cheap and cost-effective. The later the EIA is done, the more clumsy and ineffective the whole procedure becomes.

An EIA Resulting in Project Cancellation

Emperor Gold Mines in Fiji investigated using a coastal area for tailings disposal to reclaim land for subsequent agricultural use. An Environmental Impact Assessment carried out for the company by consultants established that the environmental controls required to make the tailings safe for agriculture made the project uneconomic, and the proposal was dropped.

THE ROLE OF THE 'ENVIRONMENT UNIT' IN EIA

Most of the island governments of the South Pacific have now established an Environment Unit. This unit is responsible for much of the government activity surrounding the management of EIAs, with the remainder being done by the other government departments who initiate development projects. The role of the Environment Unit in the EIA process is:

to screen projects to decide if they need an EIA,
to scope the EIA,
to review the completed EIA,
to make recommendations to minimise environmental effects, and
to monitor/enforce any environmental requirements resulting from the EIA.

Screening

Screening refers to deciding if a project requires an EIA. Some countries try to legislate when an EIA is required and when it is not. This can lead to problems. For instance, one South Pacific country requires that all proposed hotels larger than 80 rooms must undergo an EIA. This has lead to most hotels having 79 rooms. On the other hand, if the decision as to whether or not an EIA is required is left to a person at the Environment Unit, he will be under a lot of pressure to give waivers. For example, in the Philippines, which has a comprehensive but burdensome EIA procedure, 3853 projects were submitted to the Environmental Management bureau, and only 58 were required to submit EIAs.

The best solution is to require that all projects need EIAs, but to expect only little EIAs for little projects. Of course, routine projects like road maintenance would not require an EIA, neither would routine building applications in areas covered by building and zoning regulations. But all projects larger in scope than these routine items should be subject to an EIA: it is a good management tool.

Scoping

Scoping refers to deciding what should be included in an EIA. Assume that the Public Works Department (PWD) in Vanuatu wants to dredge a small river on Santos to make a safe dock for fishing boats. The Department wants to do the right thing, so the PWD engineer approaches the Environment Unit asking what would be required in an EIA.

The answer to PWDs question about `what is required' is called scoping. The EIA officer must give PWD the list of the main items he wants the EIA to deal with.

Since an EIA officer cannot be an expert on all the possible EIAs he will be required to scope, he has to have some help. First he should pull out a book with a checklist of environmental concerns. The most commonly used book is the Asian Development Bank book on environmental guidelines for its project officers. This checklist is a good starting point.

The next step is to go to the site with the PWD engineer in charge of the project. The EIA officer might spend half a day at the site with the engineer, getting the engineer to explain where the dredging will take place, where the dredge spoil will go, where the docks will be built, and so on. The whole time he should be probing the engineer about why the site was chosen, what were the alternatives, who wants the project and why. This information on reasons and alternative sites will be important if there are problems with the present site.

After getting to know the project, the EIA officer should spend the second half of the day drinking grog. Grog at the closest village to get their opinions. More grog with the local fishermen.

At the end of one day spent in this way, the EIA Officer will have a pretty good idea of the site, the project, and the problems. He can now take his checklist and turn it into a list that is appropriate for the site and the project. And now the EIA has been `scoped'.

Getting into the routine of scoping EIAs ...
Given the size of the Vanuatu economy, the Environment Unit would probably get on the order of one EIA scoping request per month if every project in Vanuatu was referred to them. As time goes on, the Unit will inevitably notice that the same sorts of concerns keep re-occurring, and the whole process will get easier and more routine.

Reviewing

Reviewing refers to checking an EIA to assess its accuracy and completeness, and looking for serious environmental/social effects that require monitoring, mitigation or project alteration. In reviewing an EIA, it should be compared with the requirements made during the scoping process, and with the general outline of an EIA given above. In so doing, the following questions should be asked:

Are there obvious gaps in the coverage of the study now that the EIA is done (did the scoping miss things which should have been included?)
Is there evidence of bias in the report?

Are social impacts included? What evidence is there that affected people were consulted?

Are long term as well as short term effects considered?

Are indirect effects as well as direct effects considered?

Are clear predictions made about possible impacts and their severity?

Does the EIA identify beneficial effects as well as adverse effects?

Are suggestions made for mitigating adverse effects? Are alternative methods, sites, disposal methods included and evaluated?

Is a monitoring programme proposed, and are key indicator variables identified for the monitoring programme?

Can members of the local community understand the information?

Is technical information easily available to those wishing to follow up on specific points?

Is there a clear and concise summary outlining the potential effects, both beneficial and adverse, on the environment?

Once the EIA is received and reviewed, the Environment Unit will need to decide if it is satisfactory, and if the environmental effects are sufficiently controversial to send to a more senior level for a decision. If the project or the impacts are minor, then the Environment Unit can give the go-ahead.

Monitoring

There is little point in having environment impact assessments done if there is no programme to monitor and enforce the actions of developers, so that promises made in the EIA are kept. For instance, if the EIA states that sewage treatment will be installed to reduce waste to particular levels, then a monitoring programme should be required to show that the sewage system works properly. In general, the developer should pay for this monitoring as a part of his project costs.

The answer is not easy. In part, the answer is that EIAs are not perfect, and sometimes the predictions are wrong. However, there are other more blatant examples where the promised construction practices are avoided or ignored. The first line of defence is for the government to monitor the construction phase of the project. This can be done by an Environment Unit officer visiting the site from time to time and asking pointed questions related to the EIA, or it can be done by requiring the developer to fund a monitoring programme. The consultant who is hired to do the monitoring can then report to the Environment Unit any incidents of non-compliance.

Enforcement

When the Tropic Wood Drasa sawmill in Fiji was built, the EIA stated that all of the waste wood would be used in the boiler for making electricity. However, five years after the construction was completed, there is an immense pile of waste wood which is continually on fire, which grows everyday, and which will be a major environmental liability by the time the plant reaches the end of its natural life. How can this kind of non-compliance with the promises of an EIA be dealt with?

If an EIA makes promises as mentioned above, then there needs to be an enforcement mechanism. There is no point in making a statement in an EIA that the developer will provide new school rooms for the neighbouring village if there is no means of enforcement. The most obvious way to ensure that the terms and promises of an EIA are kept is to post an `environmental bond' at the beginning of the project. This money is than kept by the government until all conditions in the EIA have been satisfied. Another method is to withhold the business or operating licence until all conditions have been met.

Pacific Fishing Company (PAFCO) is a tuna cannery owned by the Fiji government in Levuka, Fiji. In 1990, after extensive negotiations, the Australian aid organisation AIDAB agreed to provide $10 million dollars to upgrade the cannery. However, AIDAB insisted that an EIA be completed for the development, paid for by PAFCO, before the project could go ahead. The EIA identified several environmental concerns, including:

an outfall to remove the wastes from the lagoon area to beyond the reef;
reclamation of the quarry;
leaving a strip of park beside the container yard.

These three concerns were dealt with in the project planning. A monitoring programme was established to check if the company maintained its commitments on these and other items. However, no enforcement mechanism was included to deal with non-compliance.

At the present time the construction is complete, but the outfall is floating at the entrance to the reef because of engineering problems; the quarry has not been reclaimed; and the park is a strip of bare land. If an environmental bond had been posted, it would have provided a means to ensure that the environmental work got finished as promised.

THE ROLE OF THE DEVELOPER IN EIA

The developer, or proponent, of a project can be from the private sector, such as a national or multinational company. Or the developer can be a government department as in our example above. Since more than half of the major developments in South Pacific countries are done by government departments (roads, sewage treatment, major government buildings, wharfs, drainage and irrigation, etc), this booklet for government officials needs to consider the role that the developer plays in the process.

At the outset, the developer is responsible for obtaining from the `Environment Unit' the scoping document which outlines the EIA requirements for the project. Usually, the developer will then hire consultants to do the required work for the EIA. At this point the success of the EIA will depend on how well the `terms of reference' for the consultants are written.

Preparing clear and specific terms of reference for consultants is important in obtaining good work at a reasonable price. It is important to remember that the self interest of the consultant is to do as much work as possible at the highest price possible. In order to control this self interest, the usual solution is to put the conduct of the EIA out to bid, if it is a project over about $10,000 US. The bidding process will keep costs down to a minimum. However, for the bidding to be meaningful, the terms of reference have to be clear to all the bidders, so that they are in fact bidding on the same programme of work. (For projects under about $10,000, the bidding process will probably not be worthwhile, and dealing with a reliable consultant on a personal basis is probably preferable.)

The terms of reference need to include the scoping information obtained from the `Environment Unit', since the goal of the EIA is meet these scoping requirements. However, the terms of reference may well need to be more precise than the wording in the scoping document from the Environment Unit. Since the developer is paying for the consultants, he will want to indicate clearly the level of effort that he expects. For example, public consultation can include a very wide spectrum of activity, and the developer will want to specify how much time or effort should go into public consultation.

Some Guidelines on Writing Terms of Reference for EIAs

Provide the consultants with the most detailed and thorough information possible on the proposed development

Clearly indicate the possible alternatives in the development

Specify the areas of environmental impact that should receive the most attention

Indicate possible mitigating effects that could be considered.

Indicate the approximate time or budget for the EIA

If the EIA is relatively large (above about $50,000), a bidders conference may be appropriate. At a bidders conference, the consultants interesting in conducting the EIA can come and ask questions about the terms of reference. Since the EIA is intended to satisfy the Environment Unit, Environment Unit staff can also be invited to the bidders conference, so they can reply directly to some of the questions.

After having chosen a consultant through the bidding process, or otherwise, then a contract for the consultant must be prepared which states clearly the developer's expectations, including:

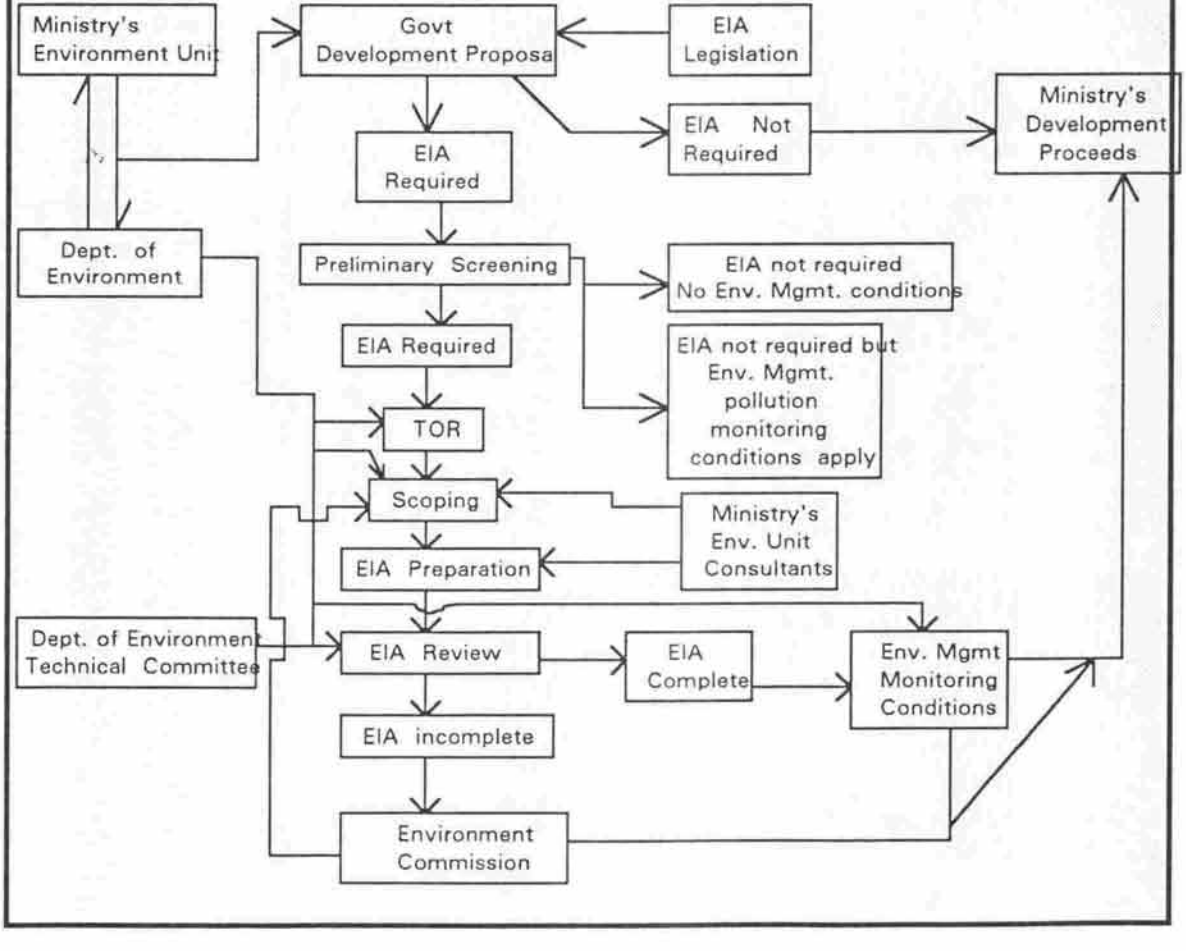
* Terms of reference as discussed above
* Delivery date of the EIA
* Frequency of meetings and progress reports
* Prior approval of changes in consultant's personnel
* Payment terms and schedules
* Number of copies of EIA reports expected
* Liability and insurance understandings
* Confidentiality expectations, if any

ESTABLISHING THE EIA PROCESS

The present situation

Most of the countries in the SPREP region do not have formal EIA procedures. However, much is happening without formal legislation. Fiji and Vanuatu, for example, have only guidelines, but they have been surprisingly effective. In Fiji, over the last two years, approximately 25 EIAs have been done on development projects - mostly resorts and marinas, but also a government irrigation project, a Ports Authority reclamation, a fish cannery expansion, and a proposed mine. In Vanuatu, about nine EIAs have been done. These results compare favourably with the Philippines, where there is comprehensive legislation, but only 58 projects underwent EIA in eight years, out of 3853 projects which were submitted.

An example EIA procedure for Fiji Government and Government associated bodies
Draft Recommendations (1992)



Establishing a formal process

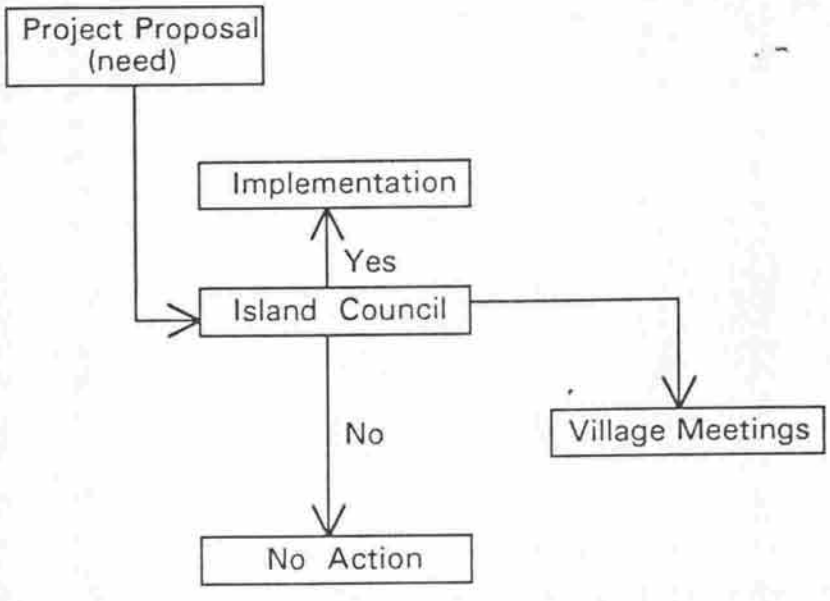
In order to establish a formal EIA process, two levels of administration are required. First, an `Environment Unit' is required to carry out the government functions of screening, scoping, reviewing, and enforcing EIAs. In many countries in the South Pacific, these units already exist with a staff of two to six people. The ` Environment Unit' can be located in a number of different departments (Town and Country Planning, Lands and Natural Resources, National Planning Office, etc). One full-time person should be able to handle the various EIA functions required of the `Environment Unit' for a population of about 500,000. Above this number a second officer would probably be required.

In addition to the Environment Unit, a second more senior body is required with the authority to set policy and make decisions about controversial projects. The senior body will need authority over other departments to require them to adhere to EIA policies. The kind of structure that often used is an inter-departmental Environment Committee, made up of permanent secretaries/ministers from the major departments that affect the environment, such as Public Works, Primary Industries, Health, Tourism, and Energy. This committee would meet perhaps six times a year and deal with setting policy, and with deciding on whether certain major, controversial projects should proceed.

Finally, each government department which impacts on the environment, should designate a middle management person their `environment officer' to ensure that the projects initiated by that department follow EIA procedures, and to act as a focal point for dealings with the `Environment Unit'.

The most important part of establishing an EIA process is to begin. Cabinet should issue guidelines that each development proposal should be accompanied by an EIA. Even the Cook Islands, with the most simple project approval process imaginable (see below) can include EIAs by simply requiring any project that is brought to the Island Council to have an EIA that deals with the environmental and social effects of the project.

An example decision-making process from Cook Islands
(no specific EIA process)



The Island Council members are elected by the people from each village. Normally these Councillors are elders with experience and knowledge of the local natural and cultural resources. They therefore assess projects based on their experience and knowlwedge.

Source: Conservation Service, Cook Islands

EIAs do not have to be elaborate, and do not necessarily require experts. If the project is small and has limited effects, then it does not need much of an EIA - but an EIA should still be required. The simplest rule is that all projects need EIAs: for projects with very limited impacts, a couple of pages of consideration of environmental and social effects is all that is needed.

CONDUCTING AN EIA:

EFFECTS ON THE NATURAL ENVIRONMENT

It is beyond the scope of this booklet to give all the details of how to conduct an EIA. However, some issues recur in many EIAs in the South Pacific. The purpose of this section and the next on social impact assessment is to give some useful information about the commonly recurring issues in the South Pacific.

Effect of Sediment on Coral Reefs

Virtually every EIA in the South Pacific has to make some references to the issue of sediment affecting coral reefs. This is so because almost every project generates suspended sediment, at least during the construction phase, and every South Pacific country is surrounded by coral.

Projects as diverse as ginger farming, mining and reef dredging may result in sediment impacts to coral. There are a number of coral characteristics which make them sensitive to sediment, including:

Corals use their tentacles to feed on plankton. Sediment interferes with feeding, requiring the coral to expend energy clearing the sediment.

Corals are permanently attached and cannot avoid sediment exposure.

The free-floating coral larvae stage will only settle and attach to clean, sediment-free surfaces.

Coral contain symbiotic algae which aid coral growth by photosynthesis. Photosynthesis is reduced in turbid water, since the light reaching the algae is reduced.

Some corals are more sensitive to sediment exposure than others. The coral shape and way it clears sediment determines its sensitivity. For example the plate and cup shaped corals tend to trap sediment and are generally more sensitive than the branching staghorn coral. The coral surface and shape of the individual polyp calices also influence sediment retention.

A high rate of sediment deposition can smother the corals from top down. Lower rates of deposition will lead to smothering from the bottom up. Long term exposure to sediment will kill all or part of the colony. Even if the exposure is not sufficient to kill the coral directly, it will reduce growth rate as energy is diverted to clearing sediment. Sediment exposure has also led to coral

'bleaching' - the loss of symbiotic algae. This has numerous effects, including reduced growth rate and reduced deposition of coral skeleton.

Sedimentation rates in the range of 50 to 100 mg per square centimetre per day will cause reduction in species diversity and percent coral cover.

Sedimentation rates can be measured using tubes approximately 10 cm in diameter and at least four times the diameter long. These tubes are then closed at one end and are either moored in the water column or positioned upright near the bottom. After several days, or weeks, depending on the sedimentation rate, the tubes are retrieved and the sediment filtered, dried and weighed.

Effects of sediment on coral can be quite easily monitored by establishing permanent sites on the reef and measuring the percentage of live cover of coral. The, "Coral Reef Monitoring Handbook" (SPC/UNEP, 1984) is a useful guide.

Mitigation of sedimentation:

Revegetate denuded land quickly.

Schedule soil disruption for the dry season and halt operations during heavy rain.

Use silt screens in open water and dykes on shallow reef flats when dredging near coral

Schedule dredging operations to avoid critical periods of fish and turtle migration and breeding.

Maintain mangrove and seagrass beds because they slow and trap sediments before they reach coral reefs.

Soil Erosion

Soil erosion is a common consequence of construction projects, agriculture and forestry, especially on steep slopes. High islands, with their water courses, steep slopes, and high rainfall are prone to soil erosion, even without the influence of man. However, poor landuse practice is the most common reason for soil erosion.

The erosion of soil leads to a reduced soil productivity and to sedimentation downstream which can lead to navigation and flooding problems. Fish habitat is also destroyed and coral is damaged once the sediment laden water is discharged to the ocean.

The amount of soil lost per year from agricultural areas in Fiji has been measured in the 10 to 170 t/ha/yr range. The higher erosion measurements correspond to a loss of about one centimetre of soil per year and cannot be sustained without loss of productivity: the natural rate of soil formation is much lower than this, probably about 10 t/ha/yr.

Mitigation of soil loss

Farming:

Farm with contour ploughing, and avoid steep slopes especially with crops such as ginger which involve a lot of soil disruption. Employ erosion control practices such as vetiver grass plantings, mulching and terracing.

Logging:

Determine the erosion potential of soils in areas to be logged and map out especially sensitive areas, avoid clear-cutting steep slopes with high erosion potential. Site logging roads to minimise erosion and employ erosion control practices. Plan logging to reduce movements of heavy machinery. Rehabilitate logged site to control runoff.

Construction:

Employ settling ponds or other means to control sediment runoff around construction projects involving earth movement or disturbance. In large project, bulldoze land as needed, not in advance. Revegetate quickly an leave trees standing where possible.

Mangrove Reclamation

Mangroves are a group of tree species which have adapted to live at the boundary of the marine and terrestrial environment. Depending on species they tend to grow at different heights along the tidal zone. The richest mangrove forests are found in estuaries and river deltas.

In Pacific Island countries, the mangrove areas are frequently the only areas which are available for development or use as garbage tips, since land above the high-tide line is usually under traditional ownership and subject to lease arrangements.

The view that mangroves are a wasteland has changed as their ecological role has been understood and the value of traditional mangrove use appreciated. Mangroves have a wide variety of ecological values:

The tangle of mangrove roots provide excellent shelter for juvenile fish species, many of which are food fish when adult. The percentage of commercial fish species associated with mangrove, at some time in their live cycle, range from 60% to 80%.

Mangroves, especially those provided with nutrients from river waters, are very productive and provide organic matter through their leaf litter. The tannin content of the leaves generally makes them inedible directly and the production enters the detrital food chain after bacterial degradation of the leaf.

Mangrove stands will stabilise shorelines once established, and help defend shorelines during storms. Mangroves slow water movement, aiding in sediment deposition and reducing sedimentation of reefs.

Mangroves provide habitat to numerous wildlife species, from birds to molluscs and fish.

Mangroves provide construction materials; fuel; medicines; tannins; food; and dyes.

Mangroves are natural sewage treatment plants, and can be used in conjunction with regular sewage treatment plants to substantially reducing the cost of treatment.

In a 1990 economic analysis by Ms. Lal for her thesis, the economic value of mangrove was determined to be of the order of $2,900F/ha/yr. $2,700 was attributed to "off-site" fisheries and $200 to forestry "on-site". Other valuations have derived figures of $1550F/ha/yr for Puerto Rico, and of $1980F/ha/yr for Moreton Bay, Australia. While these are 'academic' figures, they do indicate the magnitude of sustainable economic benefit provided by intact mangrove

areas. Development projects which promise less 'present value' for mangrove destruction than $2,000 -3,000 F/ha/yr are therefore 'wasting' the mangrove.

In conducting EIAs, it is important to remember that mangroves can also be destroyed by off-site activities. For example, coastal roads which cut off the tidal flow of water to mangrove areas will kill the mangrove. Provision for tidal flushing is essential to maintain mangroves.

Finally, mangrove areas are often eliminated by numerous small reclamations. When mangrove loss is a part of a development, the EIA should state and show clearly the amount of mangrove left in the region or country, and the amount of mangrove that has already been lost to development.

Sewage and Industrial Effluent

An EIA for a development which will discharge waste water directly into the sea or a river or a lake, must look at the effects of the effluent on the 'receiving' water. Will the receiving water be able to absorb the effluent without significant damage to the environment or human health?

The disposal of sewage and industrial effluent is a perennial problem for humanity, both within and beyond the South Pacific region. In EIAs dealing with effluent, it is important to distinguish between 'organic' effluent (sewage, plant and animal waste) and industrial effluent (zinc from galvanising plants, lead from a battery manufacturing facility, etc).

'Organic' Effluent

Organic effluent (sewage, fish wastes, slaughterhouse wastes, food processing wastes) are fertiliser for the aquatic system, and they are not intrinsically harmful. However, addition of too much nutrient, such as has happened in American Samoa from the two canneries which discharge into Pago Pago harbour, can result in a change in the ecosystem, stimulating algal growth at the expense of coral growth. With very severe nutrient enrichment, so much algal growth occurs that the dissolved oxygen in the water gets used up by decaying algae. The result is an ecological catastrophe: virtually everything will die if the oxygen is depleted. For organic effluent, the main concerns that an EIA should address are:

Dilution

Can the receiving waters (stream, river, or bay) cope with the additional nutrient load from the proposed project. The discussion leads inevitably into the amount of dilution that can be expected. In a river or stream, the volume of flow controls the amount of dilution. In a marine discharge, the amount of flushing controls the dilution. The flushing rate of a bay can be worked by determined from the tidal range and the water currents through the passes in the reef. If there is not sufficient dilution to reduce the nutrient loading to near background levels within a few hundred meters of the outfall, then sewage treatment is required to reduce the nutrients and organic loading is required.

Bacterial Contamination

The other factor to be considered with organic wastes is the effect of the waste on the bacterial counts in the river or bay. Organic wastes containing sewage result in increased bacterial counts that can cause the spread of such water-borne diseases as typhoid and cholera. The EIA should discuss the expected effects of the proposed development's effluent on the bacterial levels in the receiving water, and the possible effects of these bacterial levels on other users of the area. If the bacterial levels are likely to be a problem, then they should be reduced by treating the waste or changing the outfall location/design.

Chemical Effluent

The EIA for a proposed development that has industrial chemical waste should describe the average chemical content of the waste, and the average and peak volumes. The environmental impacts of industrial waste can be a complex subject, since there can be many contaminants in an industrial waste, and each may follow a different pathway once released to the environment.

How can a person conducting an EIA sort out the complexities of chemical contaminants? The starting point is to realise that each industry has a characteristic waste, and that there is a great deal of information on water pollution by industry. For example, the World Health Organisation has published a *Compendium of Environmental Guidelines and Standards for Industrial Discharges* (1983). For looking up individual chemical compounds to learn about their environmental fate and effects, there are now several handbooks which summarise all the known environmental information by chemical name. These reference books (see List of References) allow a person doing an EIA to easily get information on the pathways that each chemical will take in the environment, and its approximate toxicity to humans and to various other organisms.

An EIA dealing with chemical wastes should comment on the state of knowledge about the particular industrial effluent that is under consideration, and review the known environmental pathways and hazards. The EIA should explain the proposed effluent treatment method, and discuss how the resulting effluent compares in quality and quantity with national and international standards.

Cyclone/Storm Surge

Much of the population of the South Pacific lives on the coast within a few meters of sea level. Resort development in particular is almost always on the coast adjacent to beaches. Most EIAs have a section dealing with the cyclone and storm surge to ensure that the development is reasonably protected from cyclone effects.

Cyclones tend to start in the region of from 10 to 17 degrees south over water of at least 27 C and move in a southerly direction, losing strength when they reach cooler southern waters. Cyclones are more common in the western South Pacific, with Vanuatu, New Caledonia, and Fiji averaging more cyclones than Tonga and the Cook Islands. Very seldom to cyclones occur north of 10 degrees south.

Tropical cyclones are classed on a scale of mild (1) to catastrophic (5) and the scale is related approximately to storm surge and other physical measurements.

Besides the wind and flooding, the most destructive element of cyclones is the resulting storm surge. Low barometric pressure in the centre of a cyclone results in a rise of sealevel of about 1 cm for every millibar of pressure drop below 990 millibars. In a severe cyclone this results in over 50 cm rise in sealevel. Further increases are caused by the wind stress, and the wave action, with the total increase in water level reaching as high as several meters in the most severe cyclones.

In Fiji, a 30 meter setback and a minimum height above high water is required of all new resort developments along the coast. Siting of emergency facilities in particular should be safe from cyclone effects. When cyclone Kina hit Fiji (1993), the Navua hospital was flooded, losing all their medication and most of their medical equipment.

CYCLONE SCALE	PRESSURE millibar	WIND SPEED knots	SURGE max(m)
1. Mild	>990	40 - 60	0.0 - 1.0
2. Moderate	970-985	70 - 90	1.5 - 2.5
3. Severe	950-965	100 - 120	3.0 - 4.0
4. Very Severe	930-945	130 - 150	4.5 - 5.5
5. Catastrrophic	<925	160 - 180	6.0 - 7.0

CONDUCTING AN EIA:

EFFECTS ON THE HUMAN ENVIRONMENT

Social impact assessment is at least as important as the physical impact assessment we have been studying in the section above. Social impact assessment looks at the effects that the development will have on people, their lives and their livelihoods, and their culture. It attempts to answer the question: *who will benefit, and who will suffer from this development?.*

COMMON SOCIAL CONCERNS IN THE SOUTHPACIFIC

Land use change:
    loss of traditional land
Permanent population changes:
    influx of people of different age, sex, culture, race
    contribution of project to urban drift of rural people
Influx of temporary workers

Health effects/health services
Housing
Improvement/stress upon existing infrastructure

Cultural change/religious beliefs
Family dislocation
Disruption ofdaily patterns of movement
Alteration of social structure:
    creation of economic inequities or a new social class
Creation of economic dependence or independence

Employment opportunities
Chance for training, new skills
Effects on education opportunities for children

General attitudes toward development in the community
Non-government organisations and their attitudes toward the development
Planning and zoning requirements
Structure of local government
Sustainability of the social changes caused by the development

The following steps are involved in studying the social concerns listed above:

* Establish which concerns apply to the development. This is often best achieved through a process of consultation with the potentially affected community.
* Develop a list of information that is required for each concern including social baseline information and project data.
* Develop predictions of the effect that project implementation will have on each relevant concern.
* Develop measures to minimise adverse effects and maximise beneficial effects.
* Through community consultation obtain opinions on the impacts and the proposed mitigating measures.

Data for social impact assessment can come from sources such as project information; census and other demographic data; data on resource use; and information on infrastructure and utilities. However, the most important source of information is community consultation:

Community Consultation

Community consultation is an essential part of social impact assessment. It can play an important role in determining the outcome of a development proposal and in minimising conflict with the community. By taking community concerns into consideration in the early stages of project planning it is possible to address issues by either providing accurate information to the community and/or by implementing appropriate measures to minimise impacts.The main objectives of community consultation are:

* To inform the public fully about the development proposal before it is approved and correct misunderstandings;
* To obtain opinions from the public on the proposed development;
* To use the information from the community to minimise the negative social impacts of the project

Conducting Community Consultations

The first step in a community consultation programmes is to identify who will be affected by the proposal. This is not as easy as it sounds, since a development may affect many people in different ways: the table above will help with this problem.

The next step is to work out how best to consult with these people who will be affected. The aim of community consultation is not just to explain the development: it is also to obtain opinions about the development. The best means of obtaining opinions from people has to be thought out carefully, particularly in traditional communities where the chief's role and has to be considered, and the various other traditional roles understood. There is the problem of language, of the race of the questioner, of the inability of the people concerned to be able to read or to understand maps. A traditional people, who have never travelled or seen development before may need to be taken to see a development so they can understand what will happen when the development begins. Whatever the difficulties, any information flow between the developer and the community is better than no information.

Some ways of consulting with people affected by a development:

Inviting village leaders to see a similar development elsewhere, and to talk to people affected by that development;
Showing videos of similar development elsewhere;
Kava sessions with village men;
Meetings with womens' groups;
Use of the church;
Public meetings.

What advantages are there to public consultation?

From the point of view of the developer, there are numerous examples of the problems that developers get into if public consultation is not carried out. Vandalism, roadblocks, murder and chaos can result if a community feels a development has gone ahead without its approval.

Some examples from the South Pacific are:

Denarau Island tourist development: roadblocks over fishing rights
PAFCO fishing company: lawsuit over fishing rights
Vanuatu logging operation: permits cancelled due to local protests
Vanuatu Malacoula mine: theft of equipment caused company to leave
Bougainville mine: civil war

From the point of view of the public, the advantages of public consultation are clear. The people affected by a development get accurate information, and they get a chance to express their opinions on the development. Although politicians are supposed to safeguard the public interest, we all know that this mechanism

is imperfect. Direct consultation with the people affected is most likely to produce development that is of overall benefit to everyone concerned.

What are the risks of public consultation?

Public consultation carries with it some risks. If a project is not well described or well understood, fears or expectations can be created which lead to more misunderstanding instead of less. The person doing the public consultation needs to understand the local language and culture, and clearly explain the nature of the proposed development. Videos or photographs or drawings may be necessary to clearly explain the project.

CLEARING UP SOME MISCONCEPTIONS ABOUT EIAs

Misconception: EIAs should be perfect

An early fault of EIAs was that they tried to cover every possible eventuality. It is important to appreciate that EIAs are predictions about which there is always an element of uncertainty. Uncertainty can arise because not enough is known about the environmental and social processes involved, or because other factors intervene that were not predicted. EIAs will never be perfect, but then neither will market research, economic assessments, or any other management tool.

Misconception: EIA is a Single Step Process

EIA does not consist of preparing a report and having it approved or rejected. It is an iterative process. As we have seen, the proponent interacts with the Environment Unit at the screening/scoping stage, at the EIA review stage, and at the monitoring/enforcement stage. The overall goal of the process is not to create another hurdle for development: it is to avoid development that results in net harm to people and their environment.

Misconception: EIA is anti-development

The view that EIAs were a block to development by environmentalists began in the USA in the early days of the EIA system, when the courts were being asked by conservationists to rule on the adequacy of EIAs produced by developers. These actions slowed the approval process and stopped a number of proposals. However EIA does not contain any biases against development. EIA is an information- generating activity, governed by the information requirements of the system within which it works. A number of countries use EIA within an avowedly pro-development philosophy. The political decision to develop resources has been made, and EIA is used to minimise environmental disruption. Other countries might question the basic policy direction, but EIA itself can not be faulted.

MAKING EIA WORK

Political commitment

Legislation does not guarantee good EIAs. Instead the process has to rely on the people carrying out EIA to be committed to the spirit and purpose of the process. If the political system within a country does not support EIA, then it quickly loses its potency: proposals begin to side-step the requirement under special arrangements, the Environment Unit is not given sufficient resources to operate the EIA system, and so on. Hence, there is a need for a high level commitment, across many government departments, to conduct effective EIAs.

Involving the community

There is a danger that technically skilled people set themselves up as representatives of the local populations, perhaps believing that the issues involved are too technical for less educated people to cope with. This leads to a technocratic approach to EIA and is not desirable. A fundamental part of the EIA process is the incorporation of social values, as a means of distinguishing socially acceptable changes to the environment from socially (and politically) unacceptable changes. People likely to be affected by a proposal should have the opportunity to express their value judgements, and to have their evaluation of the possible changes considered. Making such judgements on their behalf can only lead to resentment and distrust of the EIA process, and of the whole decision-making process.

Having Enough Qualified Personnel

The management and conduct of EIA requires people with specific skills: understanding of the EIA process, a broad understanding of biophysical and socio-economic systems, and good problem-solving skills. They need to be trained to tackle EIA studies in an effective and efficient manner, in order to produce substantive conclusions about the possible environmental effects of a proposal.

In the average South Pacific country, one or two persons in the Environment Unit should be capable of dealing with the governments role in the EIA process. Another half a dozen are needed in private enterprise, with expertise in differing areas, to be able to act as consultants when the need arises and actually do the EIAs. Another set of about six persons are needed, one in each government department, to handle the proposals undertaken by their department. On average, about 15 people are required to operate an effective EIA process in a South Pacific country.

SPREP is working on behalf of member countries to meet this training need. Initially, key personnel in government agencies are being trained in EIA, and it is anticipated that these people will, in the future, be able to pass their knowledge on to others in their organisation. Further workshops will be held to help develop the practical skills for those actually doing the sampling and analysis. It is important that as may people as possible who deal with resource development issues become familiar with the spirit and purpose of EIA, as soon as possible. It will be a major mechanism for managing our use of the environment into the foreseeable future.

Keeping it Simple

There is no need for the conduct of EIA to be difficult, time-consuming, or expensive. Any EIA is better than no EIA. As time goes on, EIAs can get more sophisticated. The point is to consider the environment, both the natural environment and the human environment, when making decisions. It is really not that hard to do, so lets begin.

EIAs ALREADY DONE IN THE SOUTH PACIFIC

Cook Islands

A Preliminary Environmental Impact Assessment of the Cook Islands Hotel Development, Rarotonga, by Environmental Consultants (Fiji) Ltd., for the South Pacific Regional Environment Programme. 1991. 27 pp.

Fiji

Denarau Island Resort Development Supplementary Environmental Impact Assessment, by Harrison Grierson Consultants Ltd. N.Z., for EIE International Corporation. June 1989. 141 pp.

An Environmental Impact Assessment of the Savusavu Marina, by Environmental Consultants (Fiji) Ltd. for the marina developers, Kilowen (Fiji) Ltd. July 1989. 104pp.

A Report on Environmental Management at the Vatulele Resort, by Environmental Consultants (Fiji) Ltd., for Lagoon Investments Ltd. January 1990. 60 pp.

Tailings Disposal at Tavua, an Assessment of Environmental Impact, by Applied Geology Associates Ltd, and Environmental Consultants (Fiji) Ltd., for Emperor Mines Ltd. January 1990. 66 pp.

Vulani Island Resort Environmental Impact Assessment, by Barrett Fuller and Partners, and Environmental Consultants (Fiji) Ltd., for Cobweb Pty Co Ltd. June 1990. 85 pp.

Environmental Impact of the Bua Irrigation Project, by Institute of Natural Resources, University of South Pacific for Drainage and Irrigation Department Ministry of Primary Industries, October 1990. 106 pp.

Environmental Impact of the Extension of the PAFCO Cannery, by Institute of Natural Resources, University of South Pacific for the Pacific Fishing Company, Levuka. August, 1990. 45 pp.

An Environmental Impact Assessment of the Marina at Vunda Point, by Environmental Consultants (Fiji) Ltd., for Pacific Marine Yacht Consultants, Suva. June, 1991. 85 pp.

Environmental Impact Assessment of a Proposal to Establish an Integrated Sawmill/Chipmill Complex at Drasa, Western Viti Levu, Fiji by Cawthorn Technical Group, Nelson, New Zealand, for Fiji Pine Commission and BP South-West Pacific Ltd. Joint Venture. 188 pp.

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Videos Useful in Teaching EIA

'The Pacific Way'
'EIA Training Video'
'Coastal Environment of the South Pacific'
South Pacific Regional Environment Programme. PO Box 240, Apia, W. Samoa:

'Em i Graun Blong Yumi' (This is our land)
Canadian University Students Overseas. PO Box 158, Port Vila, Vanuatu:

'Thailand for Sale'
'Shrimp Fever'
'Our Planet, Our Health'
'Triangle of Life'
Television Trust for the Environment. Postbox 7, 3700 AA Zeist, Netherlands: (available free of charge for non-commercial use)