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PAPER NO. 67

TOWARD ENVIRONMENTALLY AND SOCIALLY SUSTAINABLE DEVELOPMENT

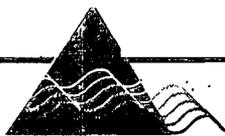
ENVIRONMENTAL MANAGEMENT SERIES

The Evolution of Environmental Assessment in the World Bank: from "Approval" to Results

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January 1999

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January 1999

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Abstract

This paper suggests that the quality of Environmental Assessment (EA) of a project – the “EA Report” – is necessary, but insufficient for successful EA. There are three main constraints to successful EA in developing countries nowadays. *First* is lack of political will to implement environmental safeguards. *Second*, the institutional capacity to implement environmental management is

weak or absent. *Third*, most environmental management priorities lack adequate financial resources for their implementation. We offer the case that the preventive and mitigatory measures, referred to as the EMP, is the most important part of the EA package. It should contain adequate provisions for budget and capacity strengthening before the project can be accepted.

Acknowledgments

Warm appreciation to our EA colleagues, Glen Morgan, Sergio Margulis, Serigne Omar Fye, and especially Tom Walton, for

comments on earlier drafts. Reinoud Post of the Netherlands EIA Commission kindly commented on the draft.

Introduction

The term “environmental impact assessment” (EA) was coined with the idea that the assessment itself of the potential environmental impacts was the goal. The emphasis was on assessment. Once we achieved the then difficult task of predicting an impact, mitigation would follow somehow. How naive we were in the 1970s! Fortunately, EA (defined below) has evolved. And so has the scope of environmental issues taken into account: from smoke pollution, and nature conservation, to environmentally sustainable development (ESD). The assessment of environmental impacts remains a core element, but now we see that it is only a first step. The science of EA has evolved such that assessment of impacts is becoming standard.¹ But once the impact has been assessed, we need to design a set of environmental management – mitigating and monitoring – measures. That step also is progressing and not insuperable. The next two steps are the more difficult; namely, securing (a) the budget and (b) the professionals to implement the mitigation

successfully. The purpose of this paper is to foster agreement that mitigation budget and capacity strengthening are essential pre-conditions for all EAs of projects seeking World Bank support.

This paper makes the case that the three currently weakest links in the whole EA process are first, lack of political will to implement environmental safeguards and make hard choices between short term development and longer term environmental management. The second weak link is securing budget to implement mitigation. The third constraint is ensuring that institutional capacity is strong enough to implement mitigatory measures effectively. In sum, the three major constraints are political support, money and trained people. This builds on the results of all EA reviews in the Bank (World Bank, 1993, 1996, a 1996b, 1997, 1998). Ability to assess impacts and design mitigation are no longer the main constraints.

Box 1

Running Definition of EA

1. Environmental assessment is an integral part of economic development. EA seeks to promote the sustainability of economic development. EA is basket of tools to improve environmental management and decision-making.
2. EA is a process that produces results. The main result is a set of safeguards against adverse impacts, first preventive – by adjustments during design; second by implementation of mitigatory measures; and third by monitoring and adaptive management during construction, operation, and thereafter.
3. Primarily, EA is designed to conserve or improve environmental services. Secondly, EA reduces and compensates for the adverse environmental impacts of a proposed project. EA reduces costs by preventing damage, especially that harming the poor, and by reducing delays.

Endnote

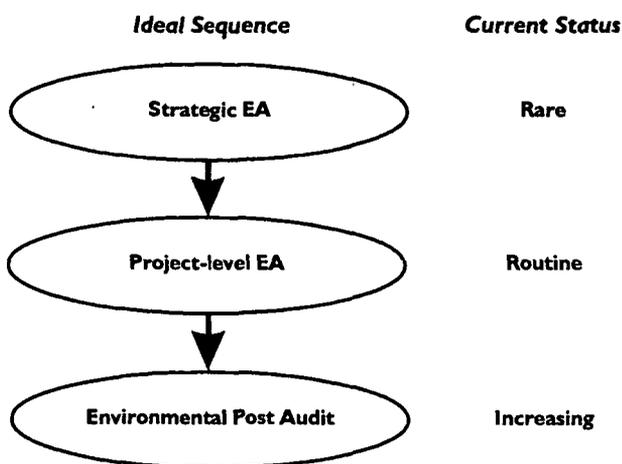
1. As there remains disagreement on which impacts are “significant,” impacts should be ranked in some order of significance. This fosters agreement over the significance threshold. Where simple ranking will not suffice, then valuation of impacts and comparative risk assessment should be fostered (*vide infra*).

1 Persuading the Proponent of the Need for EA

The difficulty of persuading the project proponent of the need for EA used to be one of the first constraints to successful EA. Nowadays, as a rule, EA is becoming mainstreamed, so persuasion should no longer be necessary. Unfortunately, persuading the proponent still needs forceful attention in some cases. International and most national EA standards require EA of all relevant projects from the earliest design phase. If, in residual cases the national legislation does not so require, international standards should be followed if international assistance is to be secured. However, there are no grounds for complacency. The World Bank (1996) found that "...there has been limited progress in achieving ownership for EA work among borrowers," and there are some cases "...which exhibit negligible ownership..."

If the proponent of a major infrastructure project does not see the need for a thorough EA, there are grounds for great concern. Proponents lack of acknowledgement that environmental needs can be significant is often the major barrier to improvement. That means either the proponent is naive and has not experienced projects of this type before, or the proponent has had experience with EA and does not want to repeat it. Either way, as soon as proponent reluctance is detected, a rethink is called for. Ownership is essential in EA if implementation is to succeed. Weak 'buy in' to the EA process suggests the borrower has little ownership and still regards the EA as a product hurdle to overcome in order to secure the loan. In such cases it would be a waste to prepare an EA that will not be implemented.

Figure 1. The Environmental Management Process



Comprehensive national legislation or policies are normally essential for successful EA. Today, if a country lacks an effective national EA policy, that should send a strong signal of systemic weakness, and should raise a red flag in any proposed project in that country. In such a case, linking approval of the project to the adoption of national legislation – as a condition of appraisal for example – would greatly increase the chances of project success, and would accelerate national environmental progress thereafter. If this is the first project that relies upon such legislation, then institution strengthening is that much more urgent. It should be started as soon as possible after project

identification and continue for as long as needed after project preparation. Experience shows that project-specific guidelines and procedures are not as effective as country-level measures.

If implementation of environmental or social mitigation is a provincial rather than a federal matter, that too is cause for concern. A national federal-level policy statement or legislation should normally be considered a prerequisite for major EAs. Experience shows that fostering project-level policies or standards is too weak; provincial-level standards often also are inadequate. Unfortunately, policies have to be top-down from the national level and adopted – modified or not – by provinces, municipalities, and projects. Proponents and contractors may claim that they will comply with all relevant national laws or policies, even when such laws or policies are inadequate. It is the duty of the financier to ensure that laws and policies are adequate at the national level to protect investments and ensure environmental prudence and due diligence.

EA without political commitment is inadequate, risky, and wasteful. Political commitment should be expressed through national legislation, official policies and resource allocation. Political commitment is the most important of the three main constraints to successful EA. Strong political

commitment should automatically translate into provisions for adequate budget and capacity strengthening. Accordingly, it is profoundly unsettling if a project proponent questions the need for an EA. When it comes to the crunch proponents may ‘accept’ to get an EA done if they want international finance. But ‘acceptance’ is not enough. It shows lack of political will, which suggests there will be problems in effective mitigation after the loan has been signed or after the project has been built. Of course, it is fine to remind proponents of the importance of EA, but if they are skeptical, or if it is the first major EA with which they have been involved, then more attention will be needed.

The related case is where an EA is completed, the hurdle for financing is overcome, the project documentation looks good, but thereafter the EA is not taken seriously. The EA is a paper report which languishes unimplemented. This is especially dangerous if the EA concluded that the currently designed project should not go ahead. This point is amplified in ‘Implementation’ (Section 4) of this paper. Implementation is fostered by having specific line items of an implementation budget integrated into the project construction budget. In addition, staff are trained specifically to implement and use the implementation budget. Reporting requirements, milestones and spot checks all support implementation and help ensure that the EA is implemented.

2 Predicting Adverse Impacts

Until recently, prediction of adverse impacts was the bulk of what was known as EA. Before then, environmental impacts or externalities were not predicted and their costs fell across all society, especially on the poor. Internalization of external costs is the fundamental goal of the entire environmental movement, and the proximate goal of EA. Formerly, the details of project design were scrutinized by EA professionals, and the likely environmental impacts or implications of the design were predicted or assessed. That is why the process was called environmental impact assessment. Most of EA effort went to predicting adverse impacts. Once an impact had been predicted, it was assumed that the proponent would automatically desire to prevent it, or the appropriate government agency would address the problem as soon as it was assessed. That was once the cutting edge of EA. Later, by the mid-1980s, the science of EA evolved so that the actual prediction of the impacts was no longer the major problem. What to do about the assessed impacts now is becoming emphasized

A crucial role for EA is to foster inter-sectoral coordination. The EA should promote coordination between different line agencies to prevent or minimize impacts. For example, as soon as the Ministry of Health reads an EA which predicts an increase in malaria due to an irrigation dam proposed for a new region of the country, the Ministry extends or strengthens its malaria control program in that region. The Ministry of Agriculture

should read EAs that predict acid deposition on rice paddies downwind from a new coal-fired thermal plant will depress rice yields.

However, governments are not as affluent they once were, and the scope of governance has been decreasing over the past 30 years. Decentralization proceeds apace, and privatization of large sectors of the economy, formerly the sole purview of the government, is sweeping the world. EA has to keep up with these powerful trends. Intersectoral cooperation between ministries formerly was easier when central governments were strong and almost the only stakeholders. Yet development projects and human populations are increasing. In addition, the private sector is often the project proponent, rather than the government. When these trends were discerned, the EA process started to emphasize mitigatory measures. These became formalized in the mid-1980s in "Mitigation Plans". The emphasis began to shift away from the prediction of impacts, and towards what to do about them.

A new, low cost requirement should be that the impacts should be roughly ranked (Box). Equal weight for major and trivial impacts suggests lack of judgment. If a major impact is omitted and minor ones get much attention, that too is a warning that the process is flawed. The bigger impacts need the most attention; the lesser impacts need less attention.

Induced Impacts: Induced or secondary impacts frequently can exceed direct or

primary impacts. For example, the construction road to Nepal’s Arun hydro would have been by far the biggest impact of this 43 ha. reservoir. Construction camp impact and that of the work force can exceed the impacts of the civil works.

EA Timing

Formerly, the biggest need in the EA process was to assess impacts early on, either during the design process or during engineering feasibility. Even now, in significant cases, the EA begins after the project is already designed, so progress is still essential with regard to the timing of the EA. Where the project is designed and only then is the EA team called in are becoming a rarity. That is success. The EA team now generally starts work simultaneously with the project design team. The design and the EA teams work together for the whole period of project preparation, often two years or more. Many EAs require one year of data as a minimum to accommodate seasonal phenomena, such as animal migrations, and this is often impossible or overlooked. By far the most effective and inexpensive means of environmental improvement are those design changes made for environmental reasons. At the end of the design period, the project has already become much better – with fewer and smaller impacts that need mitigating. Experience shows that this is the way forward for peak effectiveness at lowest cost.

If an EA team is called in when the project is being designed or worse, has already been designed, that should be a red flag to all concerned. While it still may be useful to carry out an EA on an already designed project, much of the opportunity of costless or low cost mitigation may have been foreclosed by then. For example, in the case of the controversial Sardar Sarovar dam on India’s Narmada river, the dam’s foundations had already been constructed before the World Bank was invited to join the project.

Box 2 Internalizing Negative Environmental Externalities

Mitigation plans deal mainly with ‘traditional’ environmental costs and often err in underestimating such costs.

- Resettlement costs almost always exceed initial estimates substantially (World Bank 1994), and in most cases the oustees are not as well off after the project. Does ‘development’ demand that oustees be, promptly but modestly better off immediately after their move? “No worse off” implies stagnation at best.
- Pneumoconiosis, silicosis; ‘black-lung’ disease, SO_x, and NO_x have only fairly recently been included in C/B of coal-thermal projects.
- CO₂ costs are still normally externalized in coal-thermal projects. Following Kyoto’s December 1998 UN Protocol, the World Bank Group is now starting to calculate the GHG implications of all relevant projects. The use of US\$20/tonne of C emitted is becoming the norm (Goodland & El Serafy 1998), although likely to burgeon shortly.
- Minimata disease victims (from industrial mercury effluents discharged to the ocean) took c.25 years to be compensated. Australian Aborigines waited over 40 years to be compensated for damage from UK’s nuclear testing on the Woomera range in the 1950s.
- The benefits of downstream replenishment of soil fertility by annual flooding is still normally excluded from reservoir projects.
- In cases of conflict, WTO/GATT normally protect free trade, rather than internalizing an environmental concern

Source: Daly & Goodland, 1994.

This means that the important measure of moving the dam site upstream had been foreclosed. That is a recipe for controversy and waste.

In addition, we must keep emphasizing that EA is not only an activity of project preparation, although that is where it starts. The focus of EA must now become implementation of the Environmental Management Plan (EMP) which includes (a) mitigatory measures, (b) monitoring program budget, and (c) capacity building.

Box 3**The Need to Rank Environmental Impacts**

In the first draft EA – subsequently rectified – of a recent \$4 bn. oil pipeline project, the Greenhouse Gas (GHG) implications of the construction, bulldozers, trucks, pumps etc. were all carefully calculated. However, the GHG implications of mining 38,000 cu. mts. of oil per day were omitted. This is an example of emphasizing the less important, and not dealing with the significant. It also shows how the EA goalposts keep moving. Until recently, proponents would not dream of calculating how much GHG they would emit, not even from coal-fired projects, although this has been 'best practice' at least in US EPA since 1991 (Montgomery et al. 1991; US EPA 1992). Now, since the December 1997 Kyoto Protocol and since publication of the Bank's OD 10.04, an increasing number of projects calculate GHG emissions. Such calculations inform decision-makers of this external cost, the first step towards the goal of internalization. The valuation of environmental costs and benefits has progressed greatly in recent years. In addition, such calculations used in the 'analysis of alternatives' would tend to promote hydro and other renewables, and to demote coal and other fossil-fuelled alternatives. This should become standard methodology where practicable. Environmental costs and benefits should be included in the overall financial and economic evaluation of projects as a matter of routine.

EA Budget

EA is a normal part of project preparation. This means the budget for the EA team is part of normal project preparation costs. When EA was new and unknown, development institutions tried to help developing countries by securing additional extra 'soft' funds to finance the EA in a 'fostering infant industry' approach. While this may have been appropriate at the time, it has led to a belief in some quarters that the project proponent will be given extra funds for the EA. This should be resisted. As EA is a routine part of normal project preparation, it should be financed from the same budget as the rest of project preparation, engineering feasibility, and

forth. Obtaining soft money for the EA perpetuates the myth that EA is an additional imposition. Soft money for EA represents a subsidy for EA and should cease. EA should be mainstreamed by now.

Fielding Appropriate Disciplines

This is sound analysis. Sound analysis means fielding (a) appropriate disciplines, (b) with enough experience, (c) at the right times, (d) for sufficient duration, and (e) with adequate resources. The Figure below shows the evolution of the design team, based on the example of hydroproject planning. Some decades ago it might have been appropriate to expect a single environmental generalist or 'environmental engineer' to undertake the whole EA. No longer. If a river is involved, an aquatic biologist or fish biologist should now be required (not a fisheries or fish culturist). If resettlement is involved, then an anthropologist or sociologist experienced in resettlement and land use planners will be essential. Biodiversity specialists are needed if wildlands or other habitat may be affected, and so on. Now it is generally accepted that a major infrastructure project will need a minimum of half a dozen specialists on the EA team for a couple of years.

Box 4

Case Example
Burkina Faso – Ouagadougou Water Supply Project

The EA and the engineering feasibility were conducted in parallel. Consultants prepared the EA with the design team. Then Burkinabe Government prepared the follow-on Environmental Management Plan. Cooperation between environmental professionals, engineers, and economists improved the design. In particular the width of the water supply dam's spillway was narrowed. This reduced the inundation area by 25%, decreased involuntary resettlement significantly, and diminished other impacts.

EA scoping can still be done fast and with only a couple of experienced EA professionals. Scoping should specify the disciplines and their duration needed for each, as well as the necessary interaction with all other specialists on the team. For example, “one primatologist will be needed for 6 months in two periods of three months each for the wet and dry season or the breeding or migrating season, beginning at the same time as the engineering feasibility team starts work.”

Continuity of staff is important. Continuity of the mandatory Panel of Environmental and Social Experts also is important. Ideally, the same independent external panelists should work together, once or twice a year for a couple of weeks each time, for five or even ten years, from project identification onwards. Environmental managers working with the scientific EA teams are becoming more important. The management specialist converts the scientific recommendations into operational programs and ensures they are implementable.

Agreeing on Each Measure in the EMP

The Environmental Management Plan (EMP) is the single most important part of the EA. The package of mitigatory measures normally placed after the EA itself has now been integrated into this comprehensive Environmental Management Plan. The EMP budgets for three priorities: (a) mitigation, (b) monitoring, and (c) capacity strengthening. The EA findings – the identification of impacts – must be followed by the more important next step, namely the design of mitigatory measures for each impact, designed as a safeguard against negative social and environmental impacts. Each mitigatory measure must be accompanied by an analysis of its associated costs and benefits. Some mitigations save money to the proponent. The EMP contains a budget for its own implementation. Cost estimates are

needed for each mitigatory measure. Financing has to be commensurate with need. It is the EMP that should be carefully referred to in the legal contracts and budget. Loan covenants should always – and usually do – specify, as a minimum, that the EMP shall be implemented on an agreed schedule, by an agreed budget, by agreed on disciplines. Difficulties arise where EMP implementation costs are from counterpart budgets which materialize late or not at all. The Bank is loath to resort to remedies on a project because of environmental non-performance.

It is becoming common to separate the assessment of impacts from mitigation. One recent project had one set of volumes for the EA *sensu stricto*, and another set of EMP volumes several months later. This is becoming counter-productive and inefficient..... In fact one can propose the contrary case to consider the EMP as the main document and for relegating the prediction of impacts to an annex to be consulted only for readers wanting details of why a mitigatory measure is necessary. An intermediate solution would be to insert the mitigatory measures after each ranked impact prediction.

“There is nothing more difficult to predict than the future.” Even the best designed projects cannot plan for each adjustment which is made during project implementation. In that sense, the EMP’s package of safeguard mitigatory measures should be flexible so that it can cope with changes in project implementation. However, this degree of flexibility should be accompanied by a significant effort on monitoring of implementation. Flexibility also means contingency budgets are essential to finance emergencies or unforeseen priorities.

Several projects have been known to force involuntary resettlement (only two

Table I. Historical evolution of transparency and participation: Broadening the constituency of EA¹ design teams—The case of Hydro

<i>Design Team</i>	<i>Approximate Era²</i>
Engineers	1930s
Engineers + Economists	Mid-1940s
Engineers + Economists + then add-on EIS ³ to end of complete design	Late 1970s
Engineers + Economists + Environmentalists & Sociologists ⁴	Late 1980s
Engineers + Economists + Environment & Soc. + Affected People	Early 1990s
Engineers + Economists + Environment & Soc. + Affected People + NGOs	Mid-1990s
Engineers + Economists + Environment & Soc. + Aff. People + NGOs + Fully informed Public "Acceptance" ⁵	Early 2000s?

¹ The World Bank's mandatory environmental assessment procedures are outlined in the three-volume "Environmental Assessment Sourcebook" (World Bank, 1991).

² These approximate dates hold more for industrial nations than for developing ones, although meaningful consultations with affected people or their advocates and local NGOs, and the involvement of environmentalists in project design are now mandatory for all World Bank-assisted projects.

³ EIS are "Environmental Impact Statements." They were added on to the end of a completely designed project — a certain recipe for confrontation and waste. They did not last even one decade.

⁴ "Environmentalists and sociologists" should routinely include public health specialists, management specialists, anthropologists, community planners, etc. The case can be made that social impact assessment and health impact assessment should be formalized alongside EA.

⁵ For all new major national projects, all stakeholders — affected people, taxpayers and civil society — must be fully informed at the outset, participate in the decision-making process, and broadly agree with the results. While a national referendum or plebiscite is not necessary for such projects, some measure of acceptance and broad "no objection" will increasingly be necessary.

households in the case of the Ghana Urban Transport Project; tens of thousands in the case of Zaire's Transmission line) that were not "on the books" during project preparation. This is when appropriate capacity (see below) and appropriate monitoring mechanisms are needed.

A good set of monitoring measures contains a comprehensive list of parameters to be measured and a procedure to feed this information back into the hands of the relevant decision makers in the project management. The list of parameters, comprehensive as it should be, should also be limited to significant, measurable, achievable

elements, based on experience and commonsense judgment.

The duration of the monitoring program should also be tailored to the nature of the impact to monitor. In the case of the Lesotho Highlands Water Project (LWHP) in the mid-1990s, there was the need to monitor progress in the net income of the resettled people, a requirement that is in line with the imperative expressed in the Involuntary Resettlement Policy (OD 4.30). Given the difficult land situation and the poverty of the population to begin with, an income monitoring program over a period as long as 10 years was designed and is being implemented.

Box 5

Case Example: Thailand’s Pak Mun Hydro

In 1992 this hydroproject was designed to meet 136MW of peak load between 1800-2000 hrs daily by 1995. The EA team saw that involuntary resettlement numbers were large and the proponent’s social record had been mixed in recent years. Affected people tallied 242 families during the design; eventually 2500 families were compensated, many for losses of fish. In addition, the EA team predicted that the reservoir would inundate part of a protected biodiversity reserve. The EA team recommended to the design team that the dam height should be lowered c.10 m., and that the dam site should be relocated 1.5 km up-stream in order to reduce impacts. These are acceptable mitigatory measures. Those two measures decreased involuntary resettlement, the biggest impact of the project, from 20,000 to 5,000 oustees.

3 Securing Implementation Budget

Good design is not enough. There are still massive gaps between EMP recommendations and their implementation. Implementation of the mitigation measures has to be systematic; it has to follow established procedures and guidelines. The budget has to be fully integrated into total project costs before loan signing. A separate budget for the Environmental Management Plan is a warning signal. Having to seek soft money for the EA, or for its EMP, also is a clear sign of weak political will. It is no longer a favor to seek soft money for EA or implementation. Fostering an infant industry by means of special financing, trust funds or whatever may have been appropriate until the early 1980s, but no longer. Now it is a sign of weakness or resistance. If EA is not accepted as a fully standard part of normal project preparation costs, that is a warning of future problems. Adequate implementation budget is a signal of ownership, commitment and buy-in.

Environmental performance hinges on the timely implementation of the mitigatory measures. The implementation schedule should be an integral part of the budget. The extent to which the implementation schedule is being met should be the focus of supervision and monitoring. Budgets have to be time-bound. Much implementation is time sensitive and cannot be left until later in the project cycle. Implementation must include monitorable indicators, benchmarks, or performance criteria. The critical elements here are clear budget categories for each

mitigatory measure, schedule and personnel for implementation. This should be part of total project costs, along with every other cost, and should be included in the legal covenants and loan agreements.

The standard clauses in the loan agreements should specify that all the recommendations and the entire EMP shall be implemented on an agreed schedule, using the agreed on budget, and by the now strengthened institutions. Payment for performance works effectively in OECD countries where implementive capacity is adequate. Sometimes this flexibility is preferred over a line item budget. The cost of the EA (usually less than \$500,000 for big infrastructure) is always small in comparison with the cost of the project itself, which commonly exceeds \$200 Million (See graph). While cross-conditionality is frequent for many aspects of performance, it is rare or absent for environmental performance and such as implementation of the EMP. Where construction races ahead while the EMP staggers along, such cross-conditionality is called for. That it is rare shows that environment is still not taken as seriously as other project components. The best example is where resettlement is delayed until the reservoir starts to fill. Then resettlement is rushed and oustees are hurt.

On the Bank's side, our supervision of implementation of the mitigatory measures remains weak. World Bank (1996) found our supervision 'lax'. A full 16% of those projects rated as environmentally 'satisfactory' by the

supervision mission in fact had major problems or worse. Experience shows that a professional environmentalist is required for routine supervision of the environmental mitigation program for all Category A projects at least annually.

The rule here is that the EMP is the most important part of the EA. An EA can in no circumstances be considered at all adequate until the EMP is ready (together with budget, schedule and adequate capacity to implement). In addition, the institutional capacity – the professionals expected to implement the mitigation – must be clearly identified (see below). If they cannot be so identified, a stringent institutional capacity strengthening effort is overdue.

Grudging compliance or passive acceptance of environmental precautions before loan signing must be interpreted as a serious warning that political will is inadequate. Bank leverage declines sharply after appraisal and loan signing. If a measure cannot be agreed on in advance, then its budget will evaporate and implementation will be token at best. If the EMP becomes the main document, the assessment of impacts can be relegated to annexes which may be consulted by anyone needing to know why a mitigation is proposed, or in order to see if the proposed mitigation is appropriate.

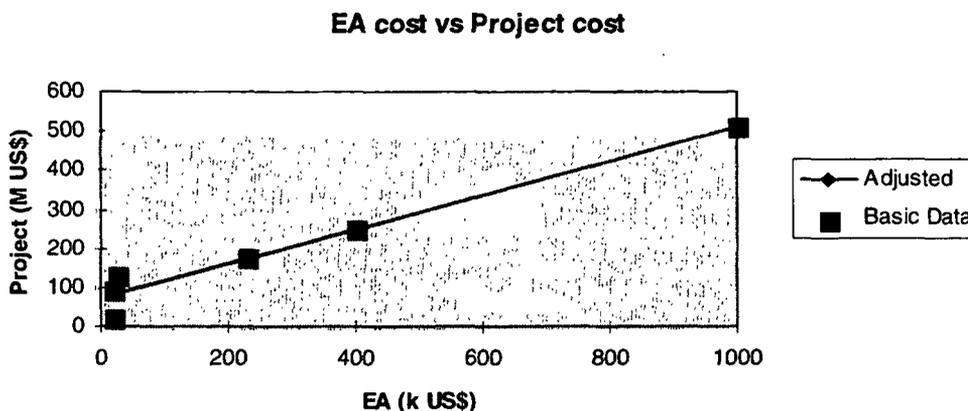
Box 6
India: Shrimp and Fish Culture Project

This Category B project (IDA \$85 Million) became effective in 1992. Most of the project financed shrimp culture in brackish water in West Bengal, Orissa and Andhra Pradesh. The EA specified the mitigatory measures; the loan covenant mandated that they should be carried out. But due to delays in contracting the monitoring, it was not carried out until discovered by the ninth supervision mission, which was the first with an environmental specialist on it. (World Bank, 1988.) For lack of appropriate expertise, eight successive supervision missions rated the environmental component as “satisfactory” when in fact EMPs had not even been prepared for the environmental component!

Effective implementation of EMP means two prerequisites: First, clear, firm and integrated budgets are needed to pay for the implementation. Second, implementation needs adequate human capacity. Budgets should be the easier of the two. It should be mandatory that the budget to implement the EMP be required as an integral part of the EMP first, and integrated into total project costs before appraisal.

Environmental budgets differ from normal project budgets in that environmental measures and needs often extend well beyond construction and into the operation

Figure 2. Cost of EA relative to total project cost



phase of projects. Some environmental impacts may become apparent some years after the project has started to operate. Then decommissioning, rehabilitation and restoration costs, depending on the *post hoc* environmental audit, are needed possibly decades after operation begins. Budget for priorities very late in the project cycle (such as decommissioning, rehabilitation) is probably best provided for in escrow accounts or performance bonds. But whatever the mechanism, audit and decommissioning costs need to be addressed during project design, and not left for years later. The most egregious case is when drainage costs of irrigation projects are needed a few decades after operation when water logging and salination has begun to depress crop yields.

Decentralization

EMP implementation and capacity are importantly linked in another way. The project design and EA process are often completed by a federal agency which then assigns implementation to a provincial agency following the start of construction. The Provincial agencies may not be clearly informed or may not understand that they have to implement the EMP. Or they may know, but lack trained capacity or fail to receive their share of the EMP implementation budget from the federal agency receiving the loan. Decentralization of implementation needs to be addressed early on during preparation of the EA and assessment of implementive capacity. Federal agencies sometime overlook the need to transfer implementation budget to the provincial agency newly responsible for implementation. Possibly the federal agency deems implementation small – something that can be carried out under the provincial current pre-project budget. The project unit responsible for implementation needs adequate authority, and should not have to rely on provincial authorities which may have little incentive to support the EMP.

Decentralization works the other way too. Many provincial projects with substantial impacts may never come to the attention of the federal environmental ministry. If the project is large or covers more than a single project, it usually would be reviewed by the federal agency. The role of the financing institution in this case is to agree on implementive responsibility early on, analyze its capacity, strengthen it where necessary, and ensure that the implementation budget flows unimpeded and promptly to the agency tasked with implementation.

Privatization

Now that the private sector is investing in large infrastructure projects, once the sole purview of the public sector, regulation needs to be retained by government or devolved onto a nongovernmental regulatory agency (for example, river basin authority), and followed by the private developer. Regulatory capacity should match private developers entrance into infrastructure projects.

Most of the environment consists of public goods, common property, and open access resources. It is the government's overriding

Box 7 Implementation Impeded by Inflation and Wet Seasons

A project in an Amazonian country with rampant inflation in the late 1980s contained an implementation budget that was so slow arriving from the central government to the distant project area that it became reduced to a tiny fraction in purchasing power. The deflated budget often arrived with the onset of the severe wet season which annually halts all field work in any event. The purchases (health clinic building materials) may have arrived with the onset of the rains and deteriorated by the time the dry season began some months later. It took the finance institution almost five years to detect this situation and correct it.

responsibility to pursue the public good. Government is the only institution capable of taxing, and often the main one involved in regulating. The Government’s regulatory function deals to a great extent with how common property may be accessed or used, by whom, and under what conditions.

On the other hand, the private sector seeks private profit, their own self-interest, and that of their shareholders. Much private sector activity exploits common property. The more costs that are externalized, the more profitable is the private sector. Government’s function is to balance private sector’s profitability with public welfare. EA started off as a governmental tool to internalize hitherto external costs. But now privatization is sweeping the globe, EA must adapt. Government’s regulatory function must be adequate before privatization takes place, especially in mandating the internalization of environmental impact costs, and the monitoring of environmental standards thereafter.

As the private sector is now often more agile and better financed, leading private sector corporations need to be able to undertake EA, strengthen EA implementive capacity, and fully meet or exceed government standards. Corporations are not interested in the Analysis of Alternatives. They have done their own profitability assessment. They have concluded they want to invest in a certain specific project, not in an alternative to that project. They are prepared to accept the risks involved. This is an added argument to promote the use of Sectoral EAs before the private sector becomes involved. As the Bank often recommends privatization as an element of Structural Adjustment Operations (a full 40% of bank lending in FY 1997), they should also promote SEAs beforehand in order to foster least cost sequences and adequate government regulation and capacity thereafter.

4 Implementive Capacity

Lack of implementive capacity has arguably become the biggest constraint to effective EAs, although institutional capacity strengthening has been mandated in Bank-assisted projects since 1991. During project preparation, we should be hosting national or sectoral workshops to foster consensus, financing a systematic series of intensive in-country courses, strengthening the best national university to offer EA courses, and sending trainees to regional environmental training centers. Sending candidates for 12 month master degrees in environmental science also is effective. Donors should coordinate to strengthen environmental institutions. Bank policy mandates that the environmental unit in the implementive ministry should be strengthened, as well as the environmental ministry. Much can be achieved in capacity strengthening by fostering seminars between the environmental units of various ministries and provincial works departments, as appropriate, several times a year. For example in Laos, it has been very clear for a decade or more that exporting hydroelectricity will be the main source of foreign exchange. This means EA professionals of several sorts and levels will undoubtedly be needed whichever specific hydro goes ahead. Yet, partly because of Thailand's 1997-1998 economic crisis, institutional strengthening has barely started.

The new President of the World Bank Group took office on 1 June 1995. By August he had canceled Nepal's \$1bn. Arun hydro long after

it had been appraised and approved by the Board, citing, *inter alia*, lack of implementive capacity. The proposed environmental and social mitigation measures were satisfactory, but implementation of these measures, in addition to increased power rates "would have imposed requirements which the Bank now judges to be beyond what Nepal could realistically have achieved at present." The seven years of preparation of this project could have been used to strengthen Nepal's implementive capacity. That is the new challenge for EA professionals: How to strengthen EA capacity before a loan is signed?

Overall, implementive capacity is more important than implementation budget. Budget without capacity will not achieve implementation. Capacity strengthening takes a lot longer than securing budget. Strong institutions demand adequate budget. Historically, consensus building among the various constituencies has rarely been a priority of EA. Local capacity is often overwhelmed merely by the EA team's work. World Bank (1996) found that local EA capacity is weak. As soon as the WBG gets serious about a project with *a priori* major environmental impacts, we should start EA training, combined with other kinds of capacity strengthening.

Capacity building is understood to mean a combination of training, institutional strengthening and networking. Isolated individuals or organizations are doomed to

failure in this day and age. The start of capacity strengthening is “needs analysis” or “institutional analysis.” This should become a routine part of the EA process and occur early on in the preparation phase of the project cycle. As EA preparation and EMP implementation are often the responsibilities of quite different institutions, the institutional analysis should identify who will be doing what, how the budget is expected to arrive from the central borrowing agency, and the extent to which the implementive agencies – which may be provincial or municipal, rather than federal or line agencies – are adequate to their future task.

During project preparation, we should be hosting national or sectoral workshops to foster consensus, financing a systematic series of intensive in-country courses, strengthening the best national university to offer EA courses, and sending trainees to regional environmental training centers. Sending candidates for 12 month master degrees in environmental science also is effective. Donors should coordinate to strengthen environmental institutions. Bank policy mandates that the environmental unit in the implementive ministry should be strengthened, as well as the environmental ministry. Much can be achieved in capacity strengthening by fostering seminars between the environmental units of various ministries

Figure 3. The Old “Approval” EA System

The emphasis was on production of the EA report itself, not on implementation of the mitigatory measures.

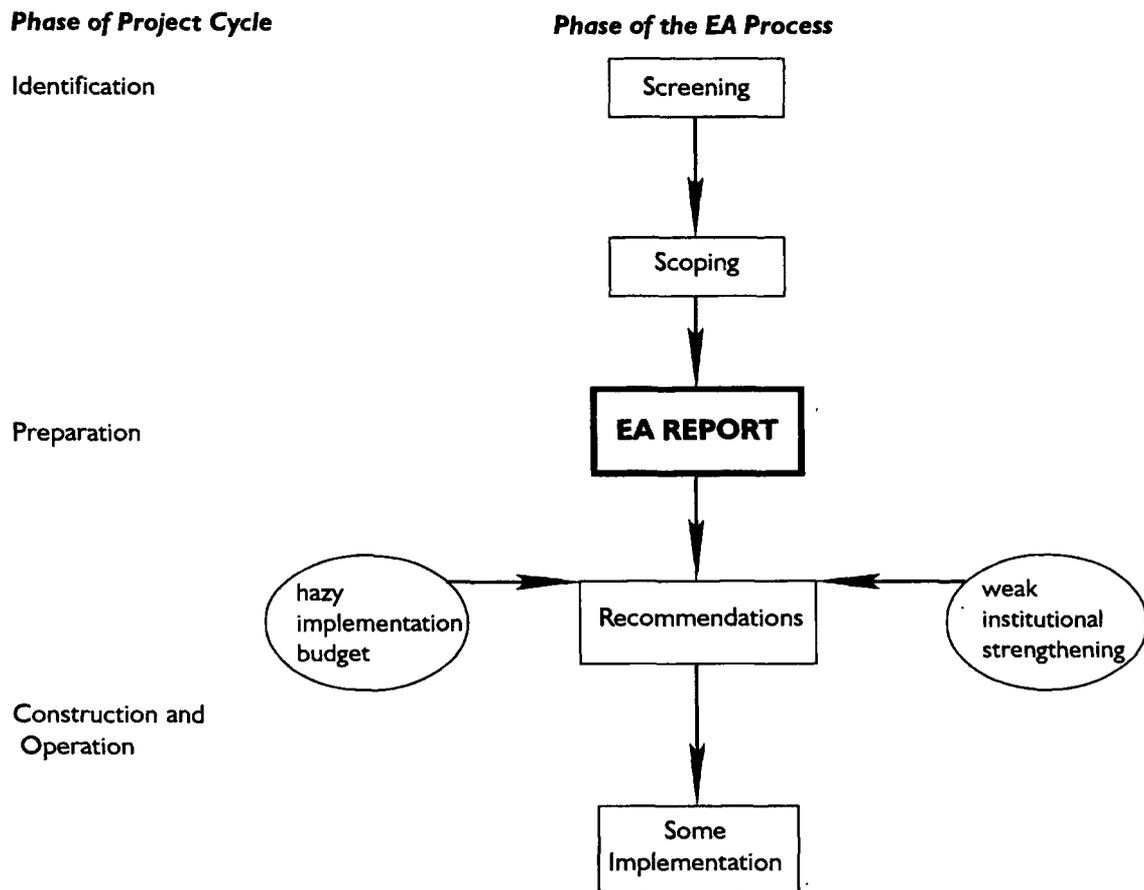
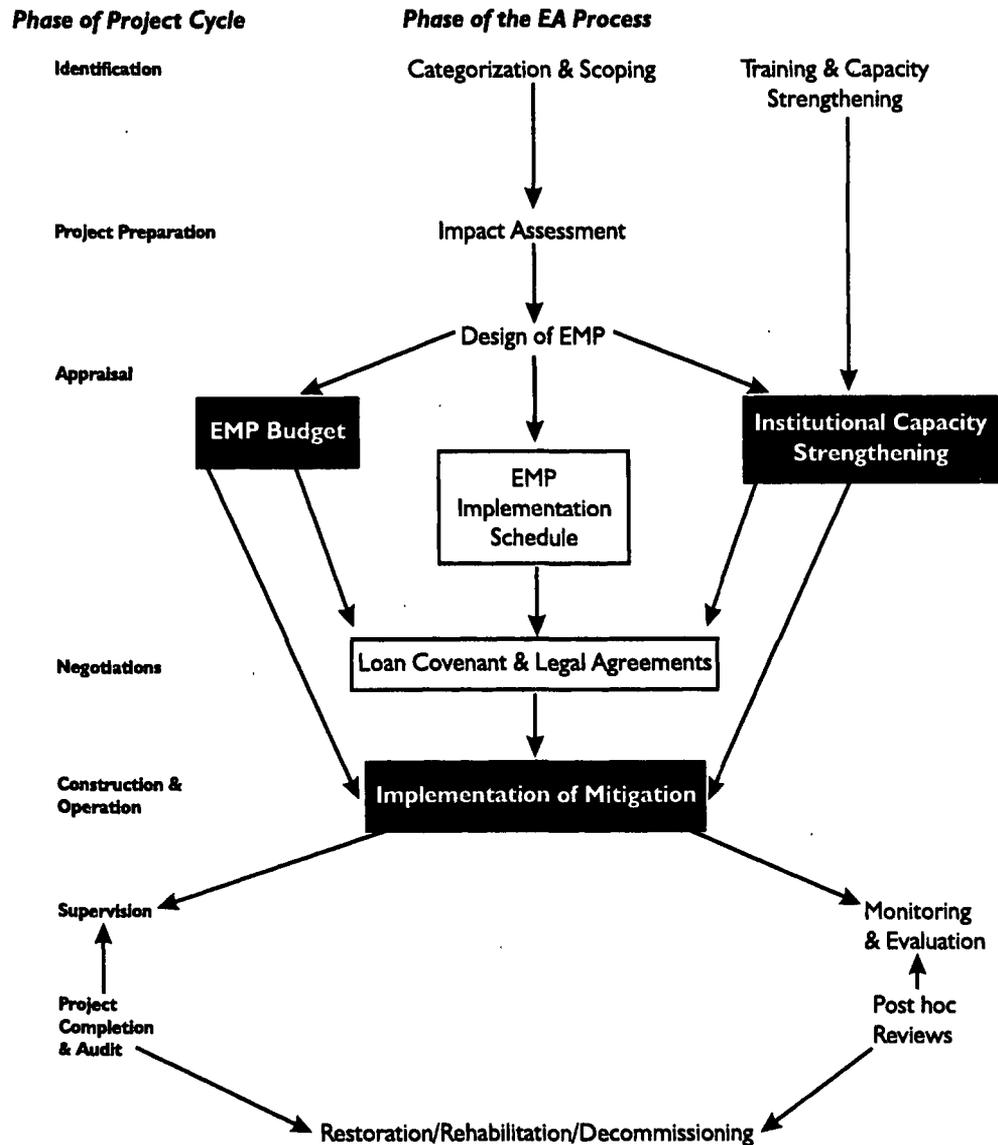


Figure 4. New Style EA Emphasis: From Assessment to Implementation

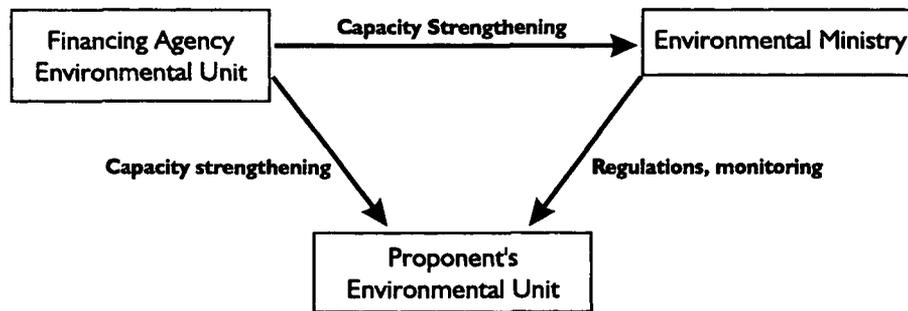


and provincial works departments, as appropriate, several times a year. For example in Laos, it has been very clear for a decade or more that exporting hydroelectricity will be the main source of foreign exchange. This means EA professionals of several sorts and levels will undoubtedly be needed whichever specific hydro goes ahead. Yet, partly because of Thailand's 1997-1998 economic crisis, institutional strengthening has barely started.

Where to send people is less of an issue than getting money to pay for capacity strengthening before we are committed to the project. Creative thinking will be needed. Innovation loans, Trust Funds, undisbursed funds from a previous project, LILs, Adaptive Lending, all may be useful sources of finance.

Effective executing organizations are essential for successful implementation of the

Figure 5. The Three Main Environmental Units



mitigation. This is often the weakest link in the whole EA chain from analysis to implementation. We must expect to sponsor intensive EA training courses for all major projects. Such capacity strengthening should ideally take place during project preparation. This is difficult as we are not good at financing training until we are sure the project will go ahead with us. This must change.

Based on experience, we now see that effective “Implementation of the EMP” is the key to successful EA. The EMP is the single most important document. The impacts to be mitigated should be *ranked*, with much attention to the major impacts, and much less attention to lesser impacts. The ranking of impacts depends on professional judgment, and is important. The specific ranking matters less than ranking categories. It is fine to categorize 700 impacts (for example, the \$3 bn., 1040 km Chad Cameroon Oil Pipeline Project) into three or so groups – important, medium and less important. But an EMP allocating equal attention to 700 impacts is

unacceptable. The top dozen or so impacts capture most of the mitigation necessary. This is not to say that all impacts may not need mitigation, but that the most effort should be allocated where it mitigates the most.

An important part of implementive capacity is coordination between three entities. First is the environmental unit of the proponent or implementive ministry. Second is coordination with the central environmental ministry or agency. Third is with the MFI or Bank’s environment staff. These three groups should agree on category of EA, screening, scoping and all other phases of the EA, especially implementation of the mitigation. The allocation of institutional responsibilities between the three entities should be clearly agreed on and specified at the outset and emphasized at appraisal. The responsibilities and budget allocation between the implementive environmental unit and that of the central governments environmental units also need clarity.

5 Participation

World Bank policy is clear: EAs must be prepared ensuring maximum participation of all stakeholders, especially affected peoples and NGOs. Participation is a very powerful mechanism to foster realistic analysis, effective mitigation and conscientious implementation. Participation is highly cost effective. It even is a means to foster political will. When we were drafting the EA policy and the EA Sourcebook in 1990, we added two examples of where participation would be especially effective, namely after the EA category had been assigned, and as soon as the first draft EA was substantially complete.

Ironically, colleagues interpreting the policy took those two examples as the *only* two occasions for participation. And many projects fail to ensure participation even at those two points. In any policy revision we should clarify that those two occasions are a rock bottom minimum. Participation should be a continuous process from identification through completion and beyond. The expectations agreed on must be explicit and keyed into project time markers. This encourages both proponent and task manager to stick to implementation agreements. The details of how participation

Box 8 "Clean Island in Dirty Ocean"

The perennial dilemma of Bank-assisted development in general applies also to EA. The Bank is a project oriented institution. We seek to help by financing one project to higher standards than non-Bank assisted projects. The learning experience, so the story runs, helps the sector by example. When we have financed several successful projects in a sector, we may evolve our support to a sectoral project. The evolution from specific project to a sectoral operation, and from there to macroeconomic support and structural adjustment is one of balance to be perennially adjusted. We may finance a project to higher environmental standards than others in that region or sector over which we have no control. But is that the most cost-effective way of improving environmental quality? The financial increment in the Bank-assisted project might be more effectively invested in neighboring projects to raise their environmental performance somewhat, rather than solely invested in very high standards in only a single project.

Brazil's Carajas Iron Ore project is a case in point. The borrower achieved very high environmental standards inside their mining concession. Immediately outside their concession illegal artisanal gold mining (using mercury), and deforestation for charcoal manufacture led to the classic clean island surrounded by a sea of appalling environmental decline. Would it have been more rational to accept slightly lower standards for the Bank-assisted iron ore project, while allocating the money saved to raising the environmental controls of the gold mining and charcoal industries? The answer is to get the initial vision right. Then the investment allocations would follow. Is the vision to supply more iron ore to the market or to conserve the regional environment for longer term benefits? Another example is the coal-fired thermal electricity industries of China or India. Should the EA of the next coal-fired coal plant insist on best available technology for the single new project, or seek marginally to improve the surrounding coal projects?

changed project design should be made explicit and emphasized.

Social Assessment

Participation also is important as a means to integrate and build synergize social impact assessment and the strictly environmental/biophysical side of EA. Formerly, EA was shorthand for EIA and SIA. In the last year or so SIA has come into its own in the World Bank (Francis and Jacobs 1998). This is warmly welcomed: Let a thousand flowers bloom. SA, which includes SIA, now has its own department, staff, procedures, guidelines, manuals, training etc. However, the fundamental links between the two have become more important than when they were more firmly linked.

Close cooperation between the EA and SA teams is essential to ensure that all impacts, such as human disease exacerbated by the project, are properly addressed. The complementarity between EA and SA is apparent where EA usually has more experience with disease vector breeding habitat, while SA is strong on the management of public and preventive health. As preventable diseases are so clearly concentrated among the world’s poorest people, EA and SA must join forces to help redress this inequity. The poor in cities also suffer disproportionately from environmental damage such as unsafe sanitation, spoiled food from lack of refrigeration, toxic fumes from inappropriate fuels and ventilation, city air pollution from industry and vehicles. In addition, as the impacts of climate change are appearing, the poor suffer most from weather and disease.

Table 2. Components of EA Report

<i>Component</i>	<i>World Bank</i>	<i>EBRD</i>	<i>IDB</i>	<i>AsDB</i>	<i>AfDB</i>
Executive Summary	Yes	Yes	Yes	Yes	Yes
Policy, Legal, Inst. Framework	Yes	Yes	Yes	Depends	Yes
Project Description	Yes	Yes	Yes	Yes	Yes
Baseline Data	Yes	Yes	Yes	Yes	Yes
Environmental Impact Analysis	Yes	Yes	Yes	Yes	Yes
Cost-Benefit Analysis	No	No	Yes	Yes	No
Analysis of Alternatives	Yes	Yes	Yes	Yes	Yes
Mitigation Plan *	Yes	Yes	Yes	Yes	No
Institution Building	Yes	Yes	Yes	Yes	No
Environmental Monitoring Plan	Yes	Yes	Yes	Yes	Yes
Consultation	Yes	Yes	Yes	Yes	Yes

Note: The Mitigation Plan, or rather, its implementation, has now become the most important element of the EA process, along with implementation budget and implementive capacity strengthening.

Source: World Bank, 1996.

Table 3. Environmental and Social Assessments

Environmental Assessment	Social Assessment
Biophysical Changes	Human Impact(s)
Pollution	Involuntary Resettlement
Species Extinctions	Gender Impacts
Human Health/Disease	Vulnerable Ethnic Minorities
Greenhouse Gas Emissions	Violence / Child Labor
Deforestation	Community Cohesion
Habitat Loss	Cultural Property
Sanitation	Employment and income generation

Some important topics need to be closely coordinated between SA and EA. For example, fish protein resources of the project-affected communities need to be assessed and mitigated jointly. The risk of SIA separating from EA at the procedural levels may often be greater than the benefits. Now that they are separate stand-alone disciplines, we should foster SA and EA done jointly or in parallel by two linked teams working closely together in time and space. Both have common stakeholders, and institutional needs assessment is often almost fully overlapped. Participation involves almost exactly the same stakeholders in EA and SA. The benefits of retaining SA/EA links are clear, and to some paramount. The area of linkages between newly separated EA and SA is a topic for more attention in the near future, and is not amplified here.

Formerly, it was civil society – the grassroots communities and affected people – that raised attention to potential impacts. But now EA has become institutionalized. EA is normally done by professionals often in less accessible institutions. Civil society's former role has thereby been reduced. Therefore, participation also has become a valuable opportunity to reaffirm linkages with grassroots. Civil society has an opportunity

to improve development through preparation of NEAPs or national environmental priority-setting exercises. But these are not frequent (every few years or so), have not yet reached full effectiveness, and are not project specific. Participation in NEAP preparation is important and needs to be emphasized. The results should always be used during the start up of the next project-specific EA, but will never substitute for participation at the project level.

Participation, especially when it starts from the scoping phase, offers a powerful opportunity for involvement of civil society. Systematic stakeholder analysis is not always done to ensure all groups and interests have opportunities. That argues strongly for starting EA scoping and participation in the media, especially newspapers. Whole page inserts in newspapers can outline the scoping and the topics on which inputs from civil society are needed. Such inserts can provide diagrams of current project proposals and sufficient information to evoke meaningful discussion. Inserts also can provide sources of further information and details of how comments can be entertained. Such media approaches vastly enhance subsequent public discussions.

6 Monitoring, Evaluation, and Audit

All EAs should have built-in independent monitoring and evaluation mechanisms as part of the EMP section. The EMP should specify monitoring and audit in advance. This is preferably set out in an agreed Environmental Monitoring and Audit program to ensure the EMP actually gets implemented. Monitoring Plans need: (a) agreed-on standards based on ambient or prevailing environmental quality, (b) quantitative measurement, or agreed-on benchmarks, (c) systematic reporting by appropriate specialists, and (d) agreed-on incentives. The World Bank's Industrial Pollution and Abatement Handbook (1997) specifies details in such cases. Where quantitative indicators are less appropriate (for example, municipal solid waste, biological impacts, green-end issues), specification of the measure and training may be adequate. Contracts for standards need to be precisely written (that is, time-weighted averages, frequency, cumulative impacts, methodologies, equipment, relations to ambient quality, location of monitoring: at the site or near the receivers of the impact, at sampling stations, and so forth).

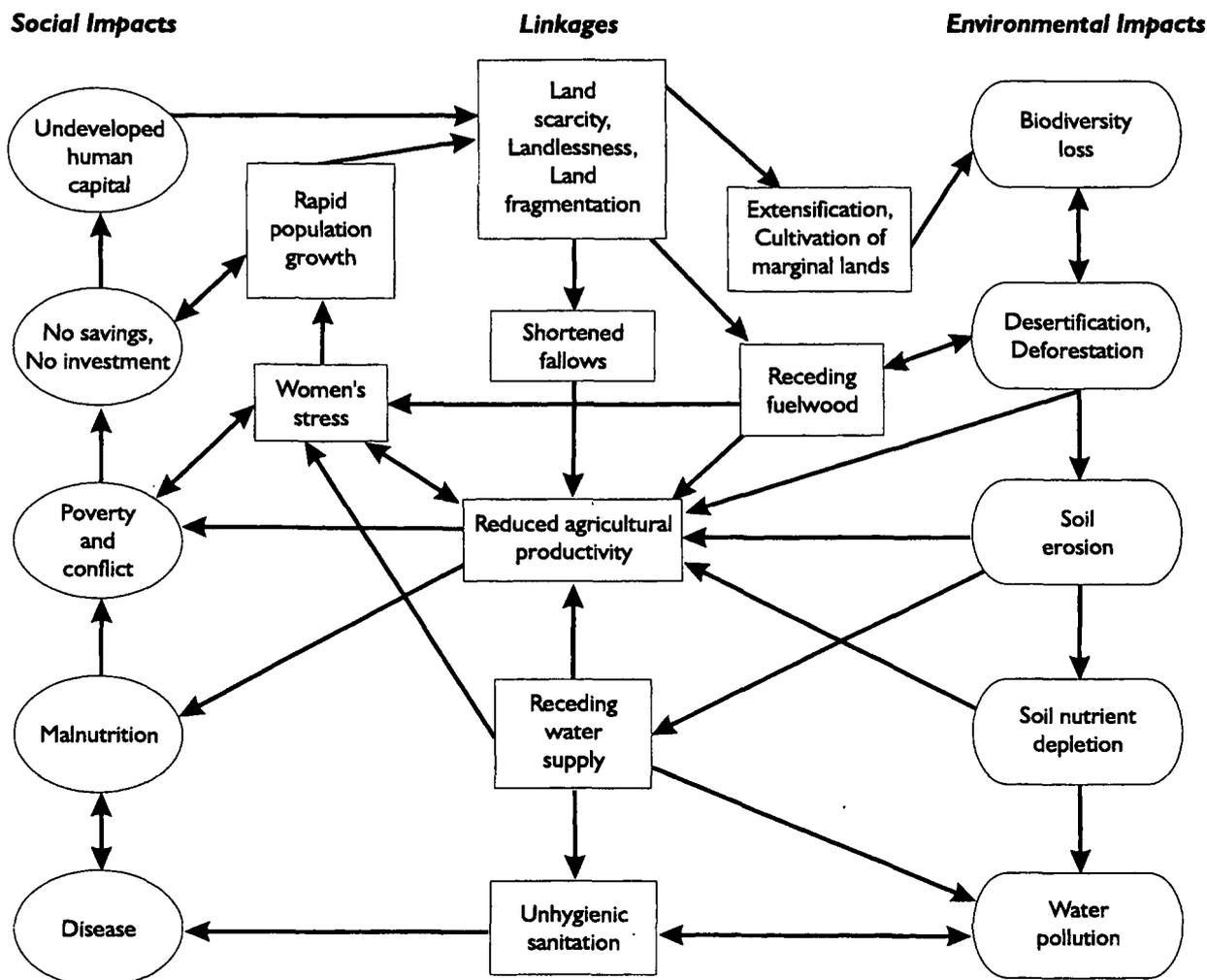
The Bank does not issue precise effluent standards for municipal waste waters as these should be case-specific and should be tailored and agreed on during the EA process. Often the question is resolved by what a municipality can afford financially. For example, in Eastern European countries: should they commit to achieving the EU Wastewater Directive? Over what period can

the country or municipality improve effluent quality to EU standards? The Bank's main means of fostering compliance is through training as part of the project. Compliance also is fostered by legal agreements on the design and operation of the project itself, inclusion of appropriate technology to meet standards (for example, electrostatic precipitators), and systematic reporting. The reporting is a combination of self-reporting by the client and less frequent audits by an independent entity, which could be the government's environmental agency or others. These are frequent during construction and less frequent during operation. In addition, Bank staff spot check on site from time to time.

In more advanced countries and for more advanced polluting industries, incentives for compliance include posting performance bonds, escrow accounts, fractions of the income stream (such as, electricity sales) allocated to environmental priorities, or for environmental performance. We find it difficult and often counterproductive to withhold payments, to suspend disbursements, or to prosecute, especially in BOT or BOOT arrangements. A mid-term review is highly desirable for major infrastructure projects as a minimum.

Monitoring and audits are also excellent ways to generate information and knowledge that should be plugged into EA work. EA is basically a predictive, risk management mechanism. The prediction of impacts in EA

Figure 6. Examples of Poverty/Environmental Linkages



Source: Goodland, 1994.

normally lack hard, precise, quantitative data, because ecology is young, and because of the complexity of impacts and interlinkages. Hard data on actual impacts

recorded from a project that was implemented long enough ago, is invaluable knowledge.

Box 9**The Evolution of Public Participation: Warning, through Consultation and Participation to Partnership – The Hydro Case**

1. Pre-1950s: WARNING
One-way information flow: oustees and other affected were *warned* that they would be flooded or impacted in a few weeks or months time and had to get out of the way for the greater good of distant citizens.
2. 1960s: INFORMATION
Primitive participation in resettlement site selection: Ousteas were *informed* that they would be flooded out, and were asked where they would like to move to among a few sites selected by the proponent; compensation often inadequate.
3. 1970s: CONSULTATION
Participation in resettlement site selection: oustees were *consulted* about their impending move, and invited to assist in finding sites to which they would like to move.
4. 1980s MEANINGFUL CONSULTATION
Resettlement participation evolves into consultation: Ousteas are meaningfully *consulted* in advance and can influence dam height of position on the river; ousteas views on mitigation of resettlement are addressed.
5. 1991: MANDATORY CONSULTATION
World Bank's "EA Sourcebook" mandates meaningful *consultation* in all EAs; EA is unacceptable without such consultation.
6. 1990s: STAKEHOLDER CONSULTATION
Resettlement consultation evolves into stakeholder *consultation*: Stakeholders views are sought on all impacts, not just involuntary resettlement.
7. 1992: PARTICIPATION
World Bank's EA Policy mandates *participation*.
8. 1996: World Bank's "Participation Sourcebook" published
9. 1997: Social Assessment separates from EA in World Bank

Box 10**Case Example: Mali – The Selingue Dam**

After fourteen years of operation, the government examined the impacts of the Selingue Dam on the physical and socioeconomic environment. The impacts ranged from hydraulic and energy aspects to ecological, health and economic aspects. This led to the following recommendations:

- Improve the standard of living of the rural population by providing running water and electrification;
- Upgrade agricultural development by proceeding with planned opening of agricultural land and providing technical support;
- Encourage better water resources management and coordinating lake activities;
- Improve fishing regulation;
- Provide better monitoring systems;
- Improve natural resources management around the lake;
- Reinforce local health plans at the community level.

7 Analysis of Alternatives

Most EAs still are applied at the project level. The EA starts when a project has already been decided upon - 'identified' in Bank terms. Project-level EA fails to help in project selection. While there is still much flexibility in design and much scope for mitigation of impacts, project-level EA is useless in the selection of the project in the first place. That is a strong argument for promoting the use of sectoral or strategic EAs (Goodland and Tillman 1996), but SEA is not the focus of this paper. The 'Analysis of Alternatives' mechanism was added to project-level EA in an attempt to rectify this weakness, but it is often too little and too late.

Project-level EA can achieve progress in two important aspects. First, EA improves the design of an already agreed on project. Second, EA mitigates residual impacts. An EA team contracted to undertake an EA of a new highway would be fired if they concluded that a rail would be preferable to the road; and a canal or fluvial transport preferable to both. Yet modal choice in transport is precisely where the greatest environmental, social and efficiency gains can be made. Whether expected or not, that is where major environmental and social benefits can often be reaped. In the transport sector, the EA is often interpreted narrowly. A good road EA should emphasize mass transit, non-motorized transport (NMT), and pedestrian facilities.

Similarly, if the EA team of a coal-fired thermal generating plant recommended a

hydro dam, they too would not be popular. But the ambit is narrowing. If the coal thermal EA made a compelling case for gas instead of coal the EA team might just may get away with it. Hydro EAs now regularly recommend lowering dam height or shifting the dam upstream (see Box 5).

The Analysis of Alternatives was added to EA procedures rather recently because proponents erroneously thought that the EA should assess impacts of the proponents design alone. In other words, proponents did not welcome the EA to propose fundamental project design changes. Analysis of alternatives is unwelcome at the time of project preparation; it should become part of sector work leading to project identification.

That archaic situation has improved in two ways. First, now that EA begins as soon as project design begins, the two influence each other positively. But the EA is still the only place to show that the proponents design is the least cost means to meet whatever goals the project seeks. Thus analysis of alternatives has grown in importance, and its importance does not sit easily in current frameworks. Now the private sector has grown so enormously in importance, analysis of alternatives needs to be overhauled.

Clearly, the government should ensure demand side management (DSM) is well in hand before permitting new generation capacity. Next, the government should compare the least cost generation method to

meet projected demand such as hydro, natural gas, coal etc. Assuming hydro is selected as least cost, then its position on the river and the height of the dam should be optimized by internalizing environment, social and conventional criteria. The private sector is not interested in, nor has any control over, much of that process. For example, whereas DSM may be beneficial for the country, the private dam proponent has no experience in DSM, and cannot make money from it. The private sector wants to invest \$ 'x' in order to generate and sell 'y' Kwh at a firm price by a fixed date. The private sector accepts the risk that the energy will be needed by a certain date and will be salable at a certain price. Strengthening government capacity to review EAs and to ensure the implementation of their mitigatory measures is the main need that the private sector cannot meet. The difficulty now arises, who should pay for the analysis of alternatives in the frequent case where the private sector seeks to invest in a specific project?

Analysis of Alternatives usefully occurs at different levels. The most immediate level addresses other configurations and some technology of the design of the project in hand. Different dam heights in hydro, different alignments in pipelines or roads, addition to bicycle lanes and walkways to highways: these are often useful. The overall level of Analysis of Alternatives overlaps with sectoral assessment (SEA), such as comparing rail and road alternatives.

The timing of Analysis of Alternatives is crucial. All too often, major decisions have been made and lots of effort has gone into engineering design of one alternative deemed by economists as the 'optimal choice' years in advance. The last thing engineers and managers want is to be forced back to the drawing board and start designing a different alternative all over again. More often than not, Analysis of Alternatives has to limit itself

Box 11

Laos: Nam Theun Hydro – Analysis of Alternatives

In Laos PDR's private sector Nam Theun II hydro, for example, the government fostered a commendable and comprehensive Analysis of Alternatives to ensure that Nam Theun II was indeed the least cost priority. The A of A examined importation of coal from various countries (Australia, Indonesia), import of LNG from Oman and elsewhere, expansion of domestic lignite thermal capacity in Thailand, and Thailand's DSM program – among other alternatives. Only then were various hydros on other rivers analyzed. At the end of the Analysis of Alternatives study, Nam Theun's dam height and position on the river were analyzed. How much of such necessary sectoral work can a private proponent be expected to undertake?

to minor sets of alternatives, including the 'no-project' option. This should all be minimized by recourse to Strategic EA.

Sectoral EA

Because Analysis of Alternatives is becoming unwieldy, it should be replaced with Sectoral EA instead (See SEA in 'Other Conclusions'). We must be careful not to drop Analysis of Alternatives before Sectoral EAs have become standard though. Sectoral EAs are more effective, for example, in modal transport choice than in the EA of a road. Generating choice is more effective in a SEA than in the Analysis of Alternatives of a hydroproject for example. Sectoral EA is the first step towards Strategic EA (Goodland and Tillman 1996; Verheem 1992, 1998, Partidario 1996 a,b). The World Bank acknowledges the power and need of SEA, but we have not historically been leaders in it. The most successful SEA has been in Nepal's Power Sector operation which ranked – socially and environmentally – 57 hydro projects, DSM, import of electricity, and fossil-fueled thermal electricity.

The record for developing countries has been less impressive than in industrial countries because financial and human resource constraints hamper adoption of SEA. Bilateral and multilateral aid agencies have started to encourage EA further upstream in planning for developing countries. In the World Bank, Sectoral EAs are becoming more common,

especially in the power, industry, and transport sectors. Coal India has just completed a Sectoral EA for all its 33 coal mine operations, under a World Bank assisted project. The Bank's (1992) EA Sourcebook has new sections on Sectoral EA, EA of International Treaties, and drafts for Regional EAs under preparation.

8 Conclusions

Unarguably, the EA process has become the major meeting point between development decisions and environmental management. It seems likely to remain so in the future. It is the responsibility of EA managers to exploit this opportunity for mutuality with decision-makers. Now that decision-makers realize that environmental management is essential to sustainable development, the EA process can expect more support in the future. Environmental specialists have to show the win-win solutions and how risks, costs, impacts and delays are always reduced by prudent environmental management. The EA process needs to adapt to the rapidly changing nature both of economic development and of environmental priorities.

The three major conclusions are:

- 1. Implementation of Mitigation:** Implementation of the mitigatory measures specified in the EMP section of the EA is by far the most important part of the entire EA process. The mitigatory measures should be ranked and agreed upon, scheduled, disciplines identified and their duration specified.
- 2. Implementation Budget:** Each mitigatory measure, or at least all those measures at the top of the rank, should have careful and individual cost estimates. The total environmental implementation budget should be a fully integrated part of the overall cost tables of the project.

- 3. Strengthen Capacity to Implement:** This takes the longest so should be started during project preparation under a LIL or undisbursed funds, or elsewhere. Institutional analysis is needed to show which institutions should be strengthened (federal, provincial, municipal, private sector, academia etc.). National and regional EA seminars can serve the dual purpose of scoping the EA and starting EA training based on today's project. As financing agencies are reluctant to finance a component unless the overall project has been signed, we will have to seek flexible and innovative means to overcome this understandable impasse. The next step in this Work-in-Progress will be the REDEEM project of Jean-Roger Mercier: Refining the Design of Environmental Management Plans.

Other Conclusions

Project-Level EA needs to be continued and strengthened. In particular it must influence project design. Analysis of alternatives and fully costed implementation of the EA's mitigation plan during project construction and operation must be made more effective.

Regional EA and Cumulative EA processes should continue to be strengthened, and more frequently used.

Sectoral EA phase-in should be accelerated in order to reduce the cost and increase the effectiveness of the benefits of project-level

EA. Sectoral EA is a fast but low-cost and powerful tool to help in project selection. SEA improves both economic C/B and least cost analysis. Only sustainable projects should be addressed during Sectoral EA and

unsustainable projects should be dropped from further consideration. This implies that sustainability analysis should be done on the portfolio of potential projects before SEA begins.

Box 12
Future Directions of EA

These first three refer mainly to project-level EA; they are traditional but reactive.

- *First*, strengthen project-level EA, and ensure it becomes a project design influencing tool, parallel to and equivalent with engineering feasibility, and never a *post hoc* justification or cosmetic for a previously designed project.
- *Second*, EAs need to be used when a specific region (for example, water basin or province is slated for a number of development projects. This becomes a “Regional EA.”
- *Third*, Cumulative EA should be routinely and systematically applied when a currently proposed project will be added to existing projects in the general area, and specifically takes foreseeable projects into account. Synergy between proposed, existing, and foreseeable projects are addressed in CEA.

The next two refer to Strategic EA and apply EA beyond the project level.

- *Fourth*, EAs of entire sectors, such as the power sector or the transportation sector, need to be completed, preferably before selecting the next project in that sector. This is the role of Sectoral EA, a subset of Strategic EAs. Economic least-cost analysis is an effective phase to add SEA.
- *Fifth*, Environmental sustainability needs to be fostered by many means, one of which is EA. A major intellectual effort is needed to see how to foster sustainability and the role of EA in that process. Both Strategic EA and Sectoral EA can be used to promote sustainability by selecting only those potential projects that are sustainable.
- *Sixth*, EAs need to be used in policy and program formulation, such as in designing structural adjustment, or in policy-based lending. EAs also should be used in national priority-setting exercise, such as the national budgeting process and in national approaches to environmental sustainability. EA of policies, programs, national budgets, legislation, and international treaties is “Strategic EA” (SEA).

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