EIA follow-up

Lessons from practice: towards successful follow-up

Angus Morrison-Saunders, Jill Baker and Jos Arts

The experiences of practitioners at recent International Association for Impact Assessment workshops on environmental impact assessment (EIA) follow-up are summarised to distil the ingredients required for success. These are presented in relation to the contextual factors that influence EIA follow-up practice: regulations and institutional arrangements; approaches to, and techniques for, follow-up; resources and capacity to conduct follow-up; and project type. In addition, the role of stakeholders is relevant in attaining successful EIA follow-up. The paper describes the relationships between these contextual factors and the stakeholder groups. It identifies some common barriers to EIA follow-up implementation and concludes with lessons learnt about what makes EIA follow-up successful.

Keywords: EIA follow-up; process strengthening; stakeholder communication; monitoring; evaluation; environmental management

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) follow-up is concerned with events that occur once a consent decision has been granted. Its principal aims are to improve project implementation with respect to environmental protection outcomes and to provide feedback on EIA processes. A more detailed definition is provided in Box 1. This paper identifies elements of successful EIA follow-up, based on the experiences of practitioners from around the world. The focus is on follow-up established under formal EIA regulations and procedures, however, the contribution of other environmental management mechanisms is acknowledged.

What makes EIA follow-up work? What are the barriers to its effectiveness? Some preliminary answers to these questions are provided, based on presentations made at a workshop on EIA follow-up held at the International Association for Impact Association’s annual conference June 2002 in The Hague as well as in former published studies. Available studies from around the world provide a ‘snapshot’ of follow-up practice in particular jurisdictions. Hence the lessons learned presented in this paper are generalisations and suggestions drawn from the available examples of current practice, rather than definitive findings.

Recently Arts et al (2001) and Morrison-Saunders et al (2001a) summarised the current state of play with EIA follow-up and highlighted its importance for current and future EIA practice. They outlined the history of follow-up, defined important terms and steps in the process, identified stakeholders and their roles and presented some recent developments and innovations in the field. In summary, there are a number of important contextual factors (‘what’?) in
Successful EIA follow-up

Box 1. A definition of EIA follow-up

Building on earlier work (for instance, Munro et al., 1986; Sadler, 1996; Au and Sanvicencs, 1996; Arts and Nooteboom, 1999; IAIA, 1999) and various workshops during recent IAIA conferences, EIA follow-up can be defined as:

The monitoring and evaluation of the impacts of a project or plan (that has been subject to EIA) for management of, and communication about, the environmental performance of that project or plan.

Thus, EIA follow-up comprises four elements (Arts et al., 2001):

- monitoring: the collection of data and comparison with standards, predictions or expectations;
- evaluation: the appraisal of the conformance with standards, predictions or expectations as well as the environmental performance of the activity;
- management: making decisions and taking appropriate action in response to issues arising from monitoring and evaluation activities; and
- communication: informing the stakeholders as well as the general public about the results of EIA follow-up (to provide feedback on project/plan implementation and on EIA processes).

which follow-up takes place and three important stakeholder groups (‘who’?) that have a role to play in answering the question: ‘how’ to make EIA follow-up successful?

What?

The context in which EIA follow-up occurs is a function of the following four factors:

- regulations and institutional arrangements: that is, the regulatory and administrative framework for conducting follow-up. As EIA systems mature and the importance of follow-up is recognised, the integration of follow-up requirements in EIA regulations is increasingly occurring;
- approaches and techniques: that is, the collection of data, the development of methods and techniques for EIA follow-up. This can range from rigorous scientific studies to more informal and pragmatic approaches. It encapsulates the monitoring, evaluation and management activities identified in Box 1;
- resources and capacity: EIA follow-up necessitates some investment in both staff and financial resources by all stakeholders involved in the process. To be effective, the benefits need to outweigh the costs in terms of time, capacity and money;
- project type: the characteristics of the project that has been subject to EIA are important for determining how to conduct EIA follow-up in a relevant manner. This relates to issues, such as the scale of the project (small vs big investments); planning level (strategic vs operational projects); and initiator of the project (private vs government proponents). In all cases it is assumed that the

need to address a significant environmental impact warrants the instigation of follow-up activities (see also Box 2).

Who?

Generally, three principle parties or types of stakeholder are involved in EIA follow-up as initiator, conductor or participant:

- Proponents, that is, private companies, utility companies or governmental organisations developing a project. Just as project management and mitigation of impacts is normally the responsibility of proponents in EIA, they are often expected to perform most follow-up activities. It is useful to realise that voluntary, self-regulatory or industry-led initiatives such as environmental management systems (EMS, for instance, the ISO 14000 series) may also incorporate some EIA follow-up functions. Follow-up carried out by proponents may be considered as 1st party follow-up.
- EIA regulators or other government agency. Here the emphasis is typically on ensuring that proponents comply with EIA approval conditions as well as learning from experience to improve EIA processes in the future, and hence EIA regulators have an important role to play. General state of the environment monitoring and policy monitoring activities conducted by government agencies may be relevant to EIA follow-up in addition to project feedback provided by proponents. Follow-up carried out by regulators may be called 2nd party follow-up.
- the community, that is, a body involving the public or other independent persons. This may range from the local community immediately affected by a particular proposal through to international pressure groups responding to major infrastructure or resource development projects. In addition, it may involve other stakeholders, such as financial organisations. The main focus in this paper is on the local community. Public stakeholders may have special knowledge of local areas and being independent of both proponents and regulators, they may have interest in evaluating the performance of both of these stakeholders in the EIA process.

Box 2. Purposes of follow-up

In addition to considering the context in which EIA follow-up occurs, it is important to consider its purpose, which includes: better project management (controlling); feedback on EIA processes (learning); and communication about environmental performance (informing). The purpose may be defined in EIA regulations or may be a product of project type. The extent to which purposes are attained will be largely a function of the approaches and techniques used and the available resources and capacity for conducting follow-up.

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Additionally, public pressure arising from unsolicited interest or scrutiny of development projects is often a driving force for proponents and regulators alike to implement EIA follow-up programmes (Morrison-Saunders et al., 2001a). The public involvement may range from direct community involvement in follow-up programmes to simply being kept informed of follow-up activities and outcomes. The informing role corresponds with the communication function of EIA follow-up identified by Arts et al. (2001). Follow-up activities carried out or initiated by the community can be considered as 3rd party follow-up.

**How?**

The interaction between the parties and the contextual factors for successful EIA follow-up outlined previously is depicted in Figure 1. This figure presents a descriptive account of the interactive factors relevant for EIA follow-up and it is not intended to provide a recipe for success. The following discussion is based around the four contextual factors. Examples from recent practitioner experiences in follow-up are presented to understand what makes it work in practice. The roles of the three stakeholder groups are also explored within these contextual factors. Finally, lessons learned about more effective follow-up are drawn from the case study examples.

**Regulations and institutional arrangements**

Increasing interest in EIA follow-up has been accompanied by developments in EIA regulations to provide for monitoring and evaluation of projects during their construction and operational phases. Examples of regulations for EIA follow-up can be found in such countries as Portugal, the Netherlands, Canada, Australia, Hong Kong, Malaysia and Nigeria. New regulations take time to come into effect in practice (for instance, because of the time lag between project approval and subsequent implementation) and evaluation of their implementation can only occur after sufficient time has passed. An example follows.

In May 2000, new follow-up requirements were introduced in Portugal (Jesus, 2000). After two years, Jesus (2002) found that only nine environmental compliance reports had been undertaken during the detailed design phase for a series of highway, railway, pipeline, harbour and transmission line projects. The follow-up process also included monitoring programmes during both construction and operation phases.

Jesus (2002) found that the environmental compliance reports have been useful to define mitigation (including compensation measures), monitoring and to obtain public feedback. He believes that monitoring during construction is changing the environmental behaviour of developers and contractors and that the publication of monitoring reports by the environmental agency will increase the responsibility of developers. However, more time and more projects are needed to fully evaluate Portugal’s newly instigated follow-up procedures.

Having regulations in place is clearly an important first step in initiating EIA follow-up. However, the presence of regulations does not necessarily guarantee that follow-up actually occurs in practice. For example, despite having thorough legal provisions for EIA follow-up in the Netherlands, van Lamoen and Arts (2002) noted that EIA follow-up activities had only occurred for 60 projects out of some 800 EIA projects that had been implemented since undergoing EIA. Interestingly though, outside the EIA framework, follow-up activities are commonly employed in the Netherlands, for instance, permit monitoring and auditing, EMS auditing and area-wide monitoring.

Similarly, despite recent requirements for EIA follow-up in Nigeria, Dayo et al. (2002), found that only about 30% of approved projects were monitored by the regulatory agency, while Mohamad-Said (2002) noted that monitoring is still lacking and

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**Figure 1. Contextual factors and parties relevant for successful EIA follow-up**
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remains one of the weak links in the Malaysian EIA process despite formal requirements for monitoring and audit dating back to 1993. Dayo et al. (2002) suggested that, in addition to making EIA follow-up requirements mandatory, what is also needed is a well-documented follow-up guideline for all sectors of the economy, to utilise a full project life cycle approach to providing feedback in the process and to improve enforcement capabilities.

With respect to highway projects in the Netherlands, van Lamoen and Arts (2002) suggested that proponent’s are willing to undertake follow-up but are awaiting guidance from the competent authority. Little practical experience is available and simple methods are needed. However, the ‘wait-and-see’ policy seems also to be related to fear of opening ‘Pandora’s Box’.

They suggest that a reverse NIMBY (‘not in my back yard’) effect may be occurring whereby the outcome of follow-up studies mostly concerns local problems and local measures, and out of fear of creating a precedent that could apply nation-wide, the competent authority may be very reluctant to take small-scale mitigation measures. Hence potentially expensive remedial works on highway projects are avoided through avoiding engagement in follow-up in the first place.

The previous examples have all flagged difficulties for EIA regulatory agencies to undertake follow-up despite legislative requirements being in place. Boyden (2002) noted that the absence of specific follow-up requirements in the UK’s EIA regulations has meant that these activities rely on the effectiveness of existing planning procedures, and the good practice of developers.

Previously Marshall (2001a; 2001b) and Marshall et al. (2001) have provided examples where industry-led initiatives have played an important role in follow-up in the UK. Here voluntarism and self-regulation in the form of environmental management systems has been one important tool that has been used successfully to drive EIA follow-up activities. This example demonstrates that self-regulation may be utilised to fill gaps or deficiencies in government regulation for EIA follow-up.

As noted previously, there is a role of the public here, in that often the motivation for industry to participate in self-regulation and other ‘green’ initiatives arises from public pressure and meeting community expectations (Morrison-Saunders et al., 2001b). An example of community-driven EIA follow-up occurred at the Map Ta Phut industrial estate in Thailand where public concern about health issues resulted in a follow-up programme by the Thai Government (see Ross et al., 2001; Morrison-Saunders et al., 2001a).

It can be concluded that there seem to be various approaches to regulations and institutional arrangements for EIA follow-up which are summarised in Table 1. Most importantly, the traditional ‘command and control’ approach, backed up by clear and strong regulations alone may not be sufficient for EIA follow-up success. Self-regulation and public pressure also play an important role.

All three approaches seem to be relevant for making EIA follow-up successful. Having some formal regulations for EIA follow-up helps to get more transparent division of roles and tasks between proponent, regulator and public. They are also important in making EIA follow-up a more structured and systematic exercise in practice. However, both commitment of the proponent (self-regulation) and public pressure prove to be essential to make formal EIA follow-up requirements more than just paper-work and to get meaningful results from it. Ideally, all three approaches should be combined since the availability of only one may be insufficient.

**Approaches and techniques**

At previous EIA follow-up workshops at IAIA conferences, presentations have provided suggestions on how to implement follow-up in practice, and various approaches and techniques have been developed (described in Arts et al. (2001) and Morrison-Saunders et al. (2001)).

**Table 1. Regulatory and institutional arrangements for EIA follow-up**

<table>
<thead>
<tr>
<th>Aspect of EIA follow-up</th>
<th>Regulatory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Command and control</td>
</tr>
<tr>
<td>Who: main driving force</td>
<td>Regulator</td>
</tr>
<tr>
<td>How: instruments</td>
<td>Formal EIA regulations</td>
</tr>
<tr>
<td>Legal requirements</td>
<td>Third party accreditation, compliance with industry standards, management of the activity, green profile</td>
</tr>
<tr>
<td>What: output</td>
<td>Compliance with the law, insight in environmental performance</td>
</tr>
</tbody>
</table>

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et al (2001a)). At the IAIA ‘02 workshop, feedback from participants was specifically sought on what methods or tools have had the most and least success when used for follow-up. This section presents both the participant and presenter responses from the workshop. These relate to all aspects of EIA follow-up in terms of both pre-decision and post-decision activities, the roles of participants, technical matters and the focus of follow-up activity.

**Pragmatic approach**

Previously it was noted that van Lamoen and Arts (2002) suggested that the potential expense of follow-up activities may inhibit practice despite legal obligations requiring it. To overcome this deadlock, they advocate a ‘pragmatic approach’ to follow-up. Such an approach was adopted by the Dutch Ministry of Transport following a series of discussions and workshops with proponents and regulators within the Ministry (as the Ministry is both developer and competent authority for road infrastructure). It involved a series of compact actions, embedded in existing procedures and programmes and fed by information from sources already available.

It is important to bear in mind that in the Netherlands an elaborate, highly developed system of environmental regulations and monitoring exists outside the EIA framework. By having an early start and using what is already there, costs and workload can be kept low, thus making follow-up almost ‘invisible’. For success, implementation of this rather minimalistic and frugal approach to follow-up focuses especially on scoping aspects.

Van Lamoen and Arts (2002) provide a framework for EIA follow-up for highway projects in the Netherlands which blends into management and maintenance programmes and links EIA follow-up of road projects to other activities in the planning process for infrastructure. They conclude that their system is “pragmatic and not really scientifically advanced” but they are hopeful that at least it may succeed in getting the process of EIA follow-up started within the Ministry.

**Permits and contracts**

In a similar manner, Dias and Sanchez (2002) noted the benefits of utilising existing permits in development projects in Brazil for enabling follow-up to occur. They advocate the use of screening to identify projects whose impacts cannot be managed through regular permits so that follow-up efforts could be channelled into projects and issues most in need of attention. Similar calls for screening and scoping for EIA follow-up have been made previously by a number of commentators (for instance, Meijer and van Vliet, 2000; Arts et al, 2001; Baker and Dobos, 2001) and feature in the generic framework for follow-up developed by Baker (2002).

Other approaches that would strengthen the EIA process were recommended by Dias and Sanchez (2002). One was to include a preliminary version of an EIA approval document in the proponent’s environmental impact statement (EIS). This would enable transparency of proposed follow-up measures at the review and decision-making stage of the process and would enable them to be incorporated into the final approval conditions.

A similar approach is currently utilised in Western Australia, whereby proponents are required to provide a consolidated list of monitoring and mitigation commitments in their EIS document and the Environmental Protection Authority includes both this list and their own recommended environmental conditions in their report to the Minister for Environment (Government Gazette, 2002). The Minister is then responsible for making the final decision and setting legally binding approval conditions.

Whilst approval conditions may be binding on the proponents of projects, it is equally important that the necessary actions are provided for in the contracts drawn up between proponents and the organisations or individuals that will actually carry out the work. The importance of clearly defined roles for follow-up activities appearing in contractor documentation has been highlighted in examples from Brazil (Dias and Sanchez, 2002), the United Kingdom (Boyden, 2002; Marshall, 2002), Malaysia (Mohamad-Said, 2002) and Hong Kong (Au, 2001). These authors noted that having clear statements of monitoring and mitigation action specified in EISs and approval conditions facilitates the transfer of these responsibilities into contract documents.

**Scientific monitoring**

Just as several authors have identified deficiencies in the consideration of social impacts in EIA relative to biophysical considerations and have offered ways to integrate social consideration into assessment and decision-making tasks better (for instance, Finsterbusch, 1995; Burdge and Vanclay, 1996; Slootweg et al, 2001; Lockie, 2001), Storey (2002) suggests the follow-up of social issues is similarly lacking.
Previously, Austin (2000) and O’Beirne et al (2000) stressed the importance of including social and local community issues in EIA follow-up.

Specifically, Storey (2002) states that experience with socio-economic effects monitoring to date has often been of limited utility for management purposes. The main reasons for this are that the purposes and objectives of social impacts monitoring are often poorly defined, indicators and measures are poorly chosen and data is limited in quantity, quality and accessibility.

Storey (2002) provides a case study of a major oilfield development project in Canada in which he compares the approaches taken for both bio-physical and social effects monitoring. Bio-physical monitoring followed a standard ‘scientific’ approach and was successful whereas the social effects monitoring was largely directionless and unsuccessful. Storey argues that a more rigorous scientific approach, similar to that used in biophysical effects monitoring programmes needs to be adopted for socio-economic factors if it is to be both credible and useful. Specifically, the approach should be based on hypothesis testing with clearly defined objectives and focusing on a small number of key variables and indicators.

The implication here is that all EIA follow-up monitoring and evaluation programmes should be based on the sorts of scientific approaches that have been well described by many authors previously (for instance, Beanlands and Duinker, 1984; Duinker, 1989; Underwood, 1991), irrespective of which components of the environment are being investigated. These authors have similarly suggested that deficiencies in the scientific integrity of environmental impact statements (EIS) contribute to poor follow-up outcomes.

Simple but rigorous techniques

A rigorous approach to EIA follow-up, as advocated by Storey (2002), may be achieved by relatively straightforward means as the following examples demonstrate. Ross et al (2001) reported how the community local to an industrial area in Thailand used their own senses (that is, their noses) effectively in an air quality monitoring programme. Marshall (2002) described a simple desk-top evaluation technique used at the draft EIS stage that has been developed for use in the UK to ensure that proposed mitigation measures are integrated into the overall development programme and its local environment.

Finally, Ross (2002) demonstrated how traditional knowledge of Aboriginal people has been used in wildlife monitoring programmes for the Ekati diamond mine in Canada. In order to monitor caribou and wolverine populations potentially impacted by the mining operation the follow-up study utilised local knowledge by Aboriginal groups since they have the best information available about these issues. This obviated the need for potentially expensive scientific ecological monitoring programmes, which would have been difficult to implement in the near Arctic conditions, whilst also actively engaging the local community in the follow-up programme.

The use of Aboriginal experience and knowledge is straightforward. However, it should be realised that such knowledge is the accumulation of a life or even many generations of experience and in this sense is very sophisticated. By tapping into local knowledge, communities can contribute to the success of follow-up.

One workshop presentation reported on the findings of a follow-up programme in the Netherlands involving both biophysical and social effects. In undertaking monitoring for a composting plant in the province of South Holland, technical difficulties were encountered where a biophysical emission resulted in social impacts being encountered (van Vliet, 2000). Specifically, the problem surrounded the functioning of the air treatment system which utilised washers and bio filters to remove odour from the composting plant emissions. Technical problems arose in trying to determine acceptable nuisance levels for the odour emissions from the plant. The problems associated with odour highlighted the need for flexible and adaptive approaches to follow-up.

Van Vliet (2000) reported that the original permit awarded to the composting company drew on an odour policy that was based on the perceptibility of the odour in sensitive (residential) built-up areas. Since the permit was awarded, the odour policy had been altered to also incorporate the nuisance level of odour. Following public complaints about odour, a number of investigations and modifications of the air treatment system have occurred. To accommodate both the changes in policy and the technical alterations of the plant has required a flexible permitting system on behalf of the EIA regulators as well as a succession of follow-up investigations and evaluations (van Vliet, 2000).

Flexibility and adaptive management

On the basis of Malaysian experience, Mohamad-Said (2002) similarly noted that monitoring and follow-up activities were more likely to be successful if they were carried out in a flexible manner. Examples of the advantages of an adaptive approach to EIA follow-up have previously been presented by Arts et al (2001).

However, an additional perspective on the benefits of an adaptive approach were put forward by Dik and Morrison-Saunders (2002). They interviewed representatives from proponents and regulators associated with four industrial projects in Western Australia to determine the influence that EIA approval conditions have on the environmental management practices of proponents.

A common practice in EIA in Western Australia is the setting of conditions in which an environmental objective is specified but the proponent is not directed as to how they should meet this directive.
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(Bailey, 1997; Morrison-Saunders and Bailey, 2000). This often leads to consent decisions requiring the production of environmental management plans (EMPs) in the post-decision stage of projects, but prior to project construction and operation. The EMPs provide details of mitigation and monitoring measures to satisfy EIA objectives.

Dik and Morrison-Saunders (2002) identified a preference for approval conditions requiring EMPs among both staff of the EIA regulator and environmental managers in industry in Western Australia over conditions prescribing specific mitigation measures. This preference appears to stem from the flexibility that this type of condition offers the proponent and the simplicity both of condition production and auditing for regulators. In addition to preferring this flexible approach to EIA follow-up, staff from the EIA regulator suggested that EMPs were more likely to result in a positive environmental outcome.

Although advocating an adaptive approach to follow-up, Mohamad-Said (2002) cautions against the extensive use of environmental management plans to bridge the gap between EISs and project implementation, as this may lead to EISs having only a poor monitoring content. He sees this as ultimately promoting bad practice in EIS investigations and preparation by proponents.

Boyden (2002) also notes some issues with the use of EMPs; especially that EMPs in the UK are not legally binding, and hence any mitigation measures contained within them will only be implemented on a voluntary basis. He advocates that better compliance with mitigation measures will occur if the requirements for mitigation are specified in planning conditions for projects. Hence there is an important role for EIA regulators here.

Role of EIA culture

We suggest that these differences in recommended approaches to EIA follow-up highlight different cultural approaches to EIA (or ‘traditions’). For example, the culture of EIA in Western Australia is very much focused on environmental protection and management outcomes with a clear expectation that proponents are responsible for the environmental management of their projects (Morrison-Saunders and Bailey, 1999; Government Gazette, 2002). Although Marshall (2001a; 2001b) and Marshall et al (2001) have provided examples of one company voluntarily taking a similar approach, it would appear from Boyden’s (2002) work that this is not widespread across EIA practice in the UK.

The examples from van Lamoen and Arts (2002) earlier suggest that EIA follow-up in the Netherlands is largely determined by a low-key and co-operative approach by EIA regulators because of the need for pragmatic, practical approaches in a highly regulated society with many other environmental instruments. In contrast, Hui (2000) and Au (2001) have indicated that the success of EIA follow-up in Hong Kong is dependent on a relatively prescriptive ‘command and control’ based approach using permits and contracts that are scrutinised intensively. In other countries, where regulations are limited or lacking, the initiative for EIA follow-up will often depend on public pressure.

There are no empirical studies to ascertain which approaches to EIA follow-up are the most successful. Table 2 shows how approaches and techniques might vary according to the regulatory spectrum. It gives a simplified picture in order to clarify the main differences between command and control, self-regulation and public-pressure driven follow-up.

<table>
<thead>
<tr>
<th>Aspect of EIA follow-up</th>
<th>Command &amp; control</th>
<th>Regulatory setting</th>
<th>Public pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nature of follow-up</td>
<td>Strict requirements</td>
<td>Flexibility</td>
<td>Variable</td>
</tr>
<tr>
<td>Screening</td>
<td>Always</td>
<td>Specific activities</td>
<td>Specific public issue(s)</td>
</tr>
<tr>
<td>Scoping</td>
<td>Comprehensive follow-up</td>
<td>Major issues</td>
<td>Aspects of concern to community</td>
</tr>
<tr>
<td>Methods, techniques used</td>
<td>Variable – whatever is needed to demonstrate compliance (often scientifically rigorous approaches)</td>
<td>Industry best practices, pragmatic</td>
<td>Variable (from expert judgement to scientific research)</td>
</tr>
<tr>
<td>Starting moment</td>
<td>Consent decision (in proactive regimes during EIA)</td>
<td>During EIA</td>
<td>Afterwards (construction and operation stages)</td>
</tr>
<tr>
<td>Instrument</td>
<td>Permits, contracts, licenses</td>
<td>EMPs, EMS, corporate environmental reports</td>
<td>Response to public issues raised</td>
</tr>
<tr>
<td>Focus</td>
<td>Compliance with regulations</td>
<td>(Environmental) management of activity</td>
<td>Public concern</td>
</tr>
<tr>
<td>Feedback mechanism, safeguard</td>
<td>Surveillance by regulator</td>
<td>Environmental accountancy, public account, accreditation programmes</td>
<td>Media</td>
</tr>
<tr>
<td>Main parties involved</td>
<td>Regulator – proponent (bilateral)</td>
<td>Proponent (internal)</td>
<td>Public – regulator – proponent (external)</td>
</tr>
</tbody>
</table>

Table 2. Relationship of regulatory setting to approaches and techniques in EIA follow-up
In most countries there will be a mix of these elements operating and there may also be additional environmental management tools outside the EIA framework that contribute to follow-up outcomes. However, it is suggested here that the prevailing customs and traditions in EIA, as well as the institutional arrangements, within a particular jurisdiction will need to be carefully considered when choosing approaches and techniques for follow-up activities.

**Resources and capacity**

Arts et al. (2001) noted that provision of adequate resources in terms of both finances and capacity is essential to make EIA follow-up a reality. However, they also pointed out that follow-up need not place an onerous burden on proponents and regulators. Morrison-Saunders et al. (2001a) and van Lamoen and Arts (2002) provide examples of simple approaches to monitoring and evaluation activities that have enabled follow-up to occur with limited investment in staff and financial resources required.

Clearly, the resources required for follow-up will depend on the systems that are put in place and the administrative procedures and techniques that need to be undertaken. It seems inevitable that some new staff and financial resources will be required, and this needs to be taken into account when new regulations for follow-up are introduced. For example, Jesus (2002) noted that environmental administration agencies in Portugal, both national and regional, have experienced difficulties in dealing with the additional workload that has arisen since follow-up regulations were introduced in 2000. It is likely that this situation is one that will be experienced by regulatory agencies in most countries attempting to conduct EIA follow-up, thus further highlighting the need for the identification of effective follow-up practices and approaches.

Similarly, Dayo et al. (2002) noted that making EIA follow-up mandatory was inadequate if there is no effective enforcement ability. They advocate that the Federal Government of Nigeria needs to continue to assist the Federal Ministry of Environment in developing its monitoring and enforcement capabilities. This will require improved staff development programmes and international support both at the bilateral and multilateral levels coupled with local resources to make effective follow-up a reality.

**Multi-institutional follow-up**

A multi-institutional approach to follow-up may be useful for large, complex projects. However, this may be resource intensive and so should be considered carefully before proceeding.

An example of a successful collaboration for EIA follow-up is provided by Gallardo and Sanchez (2002). In this case study, an innovative institutional arrangement was set up to review the construction of a major road project in southern Brazil. A multi-institutional, multi-disciplinary team was coordinated by the Environment Department. A state government research institution was contracted to supervise the inspection process and to prepare monthly progress reports. The proponent was obliged to correct any non-conformities revealed in these reports.

In addition to these government-based inspections (that is, 2nd party follow-up), the proponent hired its own consultants (1st party follow-up) to execute the agreed monitoring plan established during EIA and to oversee the construction activities. The consultancy team had to carry out an inspection and sampling programme with regular reports being submitted to the proponent. Finally, the contractor hired two environmental professionals as well, whose tasks were to oversee all works on an everyday basis and to find solutions to any unforeseen problems.

The complementary roles played by the contractor’s environmental professionals, the consultants and the government supervision teams proved effective. In this case study, important factors for successful follow-up included: activities based on a robust protocol; clearly stated duties and responsibilities of each party involved; and a protocol that was fully verifiable and auditable (Gallardo and Sanchez, 2002).

In this case study, the three follow-up and surveillance teams provided a framework for successful follow-up through intense supervision, reporting and a system of checks and balances. However, it was noted that this arrangement was costly. The costs were borne by the proponent and by the various regulatory agencies involved. Gallardo and Sanchez (2002) noted that the state government does not have the financial and human resources to undertake this kind of supervision for most projects subjected to EIA, and that it may be difficult trying to transpose the framework applied for this major project to smaller projects whose proponents do not have strong financial resources.

**Professional practice**

In the absence of regulatory requirements for follow-up there is greater reliance on professional quality standards to ensure that EIA promises are kept (Boyd 2002). Capacity building and professional training may consequently play an important role here in terms of educating EIA practitioners and making EIA follow-up a normal part of the profession. To date there have been no studies to indicate the uptake of follow-up practices by professionals in the face of capacity building and training initiatives.

In addition to the knowledge and expertise of practitioners, Mohamad-Said (2002) identified staff continuity as an important factor in ensuring the implementation of EIA follow-up measures. This issue
Without regulatory requirements for follow-up there is greater reliance on professional quality standards: capacity building and professional training may thus play an important role in educating EIA practitioners and making follow-up normal

affects staff in proponent and EIA regulator agencies alike. The implication here is that frequent staff turnover means loss of knowledge about particular projects and the details of follow-up programmes. This may mean that some programmes become neglected altogether or that the techniques for collecting and evaluating monitoring data change and this invalidates them.

The importance of staff expertise and continuity in EIA has previously been discussed by Caldwell et al (1982) and Tonn and Peretz (1999). Correspondingly, van Lamoen and Arts (2002) stress the importance of linking up EIA follow-up with regular operations to provide for changes in staff and to limit the costs involved. In a wider context, the potential for loss of corporate or institutional memory also necessitates the requirement for effective and efficient follow-up communication and reporting by regulators and proponents.

The benefits of audit and follow-up programmes such as EMS in terms of cost savings arising from environmental improvements in an organisation’s operations have previously been well documented (for instance, Freimann and Schwedes, 2000; Sullivan and Wynham, 2001; Annandale et al, forthcoming). Similarly, a number of practitioners have reported cost-saving benefits of EIA follow-up programmes for their case studies (for instance, Arts, 1998; van Vliet, 2000; Marshall, 2001b; Ross et al, 2001). However, there have been no empirical studies undertaken of the financial benefits of EIA follow-up to date and reported benefits have not been quantified.

Technological resources

In addition to financial and personnel resources, EIA follow-up may depend on technological resources. For example, the follow-up system in Hong Kong utilises a sophisticated internet-based reporting system (Hui and Ho, 2002). The move towards a ‘cyber-based’ follow-up system has previously been reported in Hui (2000) and Arts et al (2001). It arose from a combination of factors including the growing popularity of the internet, the public demand for transparency in EIA, the strive for improving efficiency and the e-Government policy in Hong Kong.

An EIA Ordinance website (http://www.info.gov.hk/epd/eia) was established by the Environmental Protection Department (EPD) and came into operation the same time as the Ordinance itself. Project proponents were encouraged to set up their own web sites to present EIA and environmental monitoring and audit (EMA) information in multi-media format, such as graphics, photographs and video clips (see also Morrison-Saunders et al, 2001a).

This approach to follow-up requires EIA regulators and proponents alike to invest in sophisticated information technology infrastructure. Whilst initially costly to implement, Hui and Ho (2002) suggest that it is easy to maintain, provides free access to information for the public (that is, relative to the constraints of accessing paper-based reports), provides EMA data in ‘real-time’ and does not require as much storage space as traditional bulky paper-based reports.

Au (2001) reported that the use of the internet to communicate with the public during follow-up activities in Hong Kong dramatically increased the number of participants relative to the earlier system involving office visits and paper-based reporting. Hence, whilst there may be costs for proponents and regulators in setting up a web-based approach to EIA follow-up, there can be clear benefits for community stakeholders.

Community resources

The community can also be a resource in its own right, that proponents and EIA regulators can benefit from. Denis (2002) found that having good discussions with the public was important for ensuring the success of EIA follow-up of a major hydroelectric project in Canada. A series of agreements signed in the 1970s between governments, Hydro-Quebec and Aboriginal groups included specifications for environmental follow-up programmes. A particular interest of Hydro-Quebec has been determining the effectiveness of mitigation measures undertaken in their projects. Public consultation and involvement was sought following implementation of mitigation, to determine which works should be maintained, improved or abandoned.

Denis (2002) provides several specific examples of how community involvement led to changes in ecological rehabilitation and recreational facilities downstream and upstream from a hydroelectric dam. Some of the ecological restoration work has been undertaken by Aboriginal groups directly. It would appear from this example, the work of Ross (2002) discussed previously and a recent website of the Canadian International Development Agency (CIDA, 2002) that effective involvement of Aboriginal people in EIA and follow-up is well established in Canada.

In addition to the use of Aboriginal and community-based monitoring activities for a major mining operation, Ross (2002) describes an approach to follow-up for the same project that makes use of an independent committee in which proponent, regulators
and local communities are represented. This ‘environmental watchdog’ carries out monitoring and evaluation activities for the project. The results and recommendations are reported to the proponent, government agencies and the local community.

**Capacity for follow-up**

It can be concluded that sufficient resources and capacity both within the regulator and the proponent are essential for successful EIA follow-up, whether external inspection or self-auditing is employed. However, this does not mean that with limited resources no useful EIA follow-up can be conducted. Table 3 outlines the range of activities that might be carried out for high- and low-resource capacity programmes. Additionally, the examples from Hui and Ho (2002), Denis (2002) and Ross (2002) highlight some of the benefits of involving the community in EIA follow-up and emphasise the role of community consultation for successful follow-up. They also demonstrate the importance of having an adaptive approach to EIA follow-up and how community consultation can influence ongoing project decision-making.

**Table 3. Consequences of resources and capacity available for EIA follow-up**

<table>
<thead>
<tr>
<th>Aspects of EIA follow-up</th>
<th>Limited resources and capacity</th>
<th>Adequate resources and capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comprehensiveness</td>
<td>Specific issues, pragmatic approach</td>
<td>Comprehensive (yet still focused)</td>
</tr>
<tr>
<td>Number of parties</td>
<td>One/two parties (self assessment/audit)</td>
<td>Multi-party involvement (external scrutiny)</td>
</tr>
<tr>
<td>Finance</td>
<td>No specific budgets, no funding for public involvement</td>
<td>Specific budgets, eg funding of public involvement</td>
</tr>
<tr>
<td>Methods, techniques</td>
<td>Inspections, early warning devices, low frequency monitoring, utilise existing data sources</td>
<td>Rigorous scientific methods, long-term, high-frequency monitoring</td>
</tr>
<tr>
<td>Instruments</td>
<td>Permit monitoring and surveillance, volunteer community involvement</td>
<td>External inspection teams, independent committees</td>
</tr>
<tr>
<td>Reporting</td>
<td>Follow-up report (once, periodic)</td>
<td>Frequent reports, (possibly continuous internet based monitoring and reporting)</td>
</tr>
<tr>
<td>Safeguard</td>
<td>Mainly regulator surveillance</td>
<td>Besides regulator surveillance, proponent surveillance, public accountability, certification by independent auditors</td>
</tr>
</tbody>
</table>

**Project type**

The various contextual factors of EIA follow-up seem to be rather closely related, as might be clear from the previous discussion. Moreover, they are also related to another factor: the type of project. The characteristics of a project are very important in determining how EIA follow-up can be done effectively.

In projects with large capital investment there may be room for more sophisticated forms of EIA follow-up. The use of multiple inspection teams in EIA follow-up is fairly costly as Gallardo and Sanchez (2002) have argued. However, they view this approach as useful considering the magnitude of the project. Similarly, the scientifically rigorous biophysical monitoring programme described by Storey (2002) was appropriate and could be undertaken because it was carried out for a major oilfield development. Similarly, the refined approach of an independent committee (Ross, 2002) might be considered rather expensive, but was affordable for the proponent in the context of a major mining operation.

Usually, major projects will warrant EIA follow-up more strongly and in more elaborate forms. There is a logic in this, as often there will be a relationship between the amount of money invested in a project, its strategic importance and its potential impact on the environment. It is telling that the case study presentations at recent follow-up workshops related mostly to major developments such as mining operations (Ross, 2002), oil field development (Storey, 2002), power stations and transmission infrastructure (Marshall, 2001b; Denis, 2002), construction of new roads (Gallardo and Sanchez, 2002) or new airports (Au, 2001). Moreover, the size and complexity of the recent Hong Kong airport development was instrumental in the development of the EIA follow-up instrument in Hong Kong (Hui, 2000; Au, 2001).

For smaller projects in which adverse impacts are well known and can be mitigated or where limited amounts of money are invested, a simpler form of follow-up may be all that is needed to make it practicable. For example, this might relate to: monitoring of compliance with permit requirements; using existing data about the functioning of the company or about the state of the environment; and using straightforward methods, such as using local people’s knowledge, observations and/or complaints (van Vliet, 2000; Ross et al, 2001; Denis, 2002; Ross, 2002; van Lamoen and Arts, 2002).

In addition to the amount of investments and the planning level (strategic vs operational projects), it is also relevant to consider who is the initiator of the project: a small company vs a big multinational or a government agency. For example, a small company responsible for small, straightforward projects at the operational level may employ rather simple follow-up approaches (see for instance, van Vliet, 2000). For major companies or government agencies, giving due attention to EIA follow-up might be advantageous. EIA follow-up might not only be relevant...
for a proponent because of better project management or liability issues (Ross et al., 2001) but also because of learning for conducting future EIA studies as well as communication of the environmental performance of a proponent’s activities.

The latter is not only relevant for government agencies that develop projects, but also for usually larger companies operating long-term projects or developing numerous projects in the same area. Being good neighbours with the local people and authorities is vital for such company’s future functioning in that area (see for instance, Marshall, 2001a; 2001b; Marshall et al., 2001). As a consequence, EIA follow-up might serve objectives other than controlling, such as informing about the environmental performance (communication) and learning for future EIA projects. Discussion about the objectives of EIA follow-up can be found in Arts et al. (2001) and Morrison-Saunders et al. (2001).

The issue of informing the public about the environmental performance is also relevant where a project is controversial. In these situations, follow-up approaches involving the public are especially relevant. In addition to participating in monitoring and mitigation activities directly, the public may play an important role in EIA follow-up simply by putting pressure on proponents and EIA regulators to improve project operations and practices. Van Vliet (2000), Ross (2002) and Dik and Morrison-Saunders (2002) all identified public pressure as an important factor in influencing EIA follow-up activities, and this has been also noted in previous research and publications (for instance, Arts, 1998; Morrison-Saunders, 2001a; 2001b).

Some of the key aspects of project type that may influence EIA follow-up practices are summarised in Table 4, which provides a generalised picture to clarify the main differences between major and minor projects. In practice, for instance, some small projects may cause significant environmental impacts that may require comprehensive, sophisticated methods. In addition, major companies will also operate small projects.

### Lessons learnt

This paper has summarised practical examples of what works in practice drawn from the recent accumulated experience in EIA follow-up. Baker (2002) has produced a conceptual framework for conducting follow-up (parts of which were summarised in Morrison-Saunders et al., 2001a). To date there have been few detailed empirical studies that explore the utility of follow-up techniques and procedures. These are needed if the strengths and weakness of EIA follow-up are to be quantified. However, there is now a substantial body of experience available from case studies that have been presented at recent IAIA workshops on EIA follow-up.

The lessons learnt from recent practitioner experiences are summarised in Table 5. They are presented as the factors that make EIA follow-up successful in practice. The process of identifying the successful ingredients for EIA follow-up also highlights deficiencies and pitfalls, which are summarised in Box 3 (see also Arts, 1998).

On the basis of what has been discussed, it can be concluded that there is no single means of achieving successful EIA follow-up. To obtain successful

<table>
<thead>
<tr>
<th>Table 4. Project type characteristics and approaches to EIA follow-up</th>
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</thead>
<tbody>
<tr>
<td><strong>Aspects of projects or follow-up</strong></td>
</tr>
<tr>
<td>----------------------------------------</td>
</tr>
<tr>
<td>Amount of investment, timeframe and spatial extent</td>
</tr>
<tr>
<td>Large investment, long-term, multiple projects over time in same area, larger areas, line infrastructure or networks</td>
</tr>
<tr>
<td>Planning level</td>
</tr>
<tr>
<td>Initiator</td>
</tr>
<tr>
<td>Involvement of other parties</td>
</tr>
<tr>
<td>Objectives</td>
</tr>
<tr>
<td>Nature of follow-up approach</td>
</tr>
</tbody>
</table>

### Box 3. Barriers for implementing EIA follow-up

Common barriers that hinder the implementation of EIA follow-up in practice are:

- Deficiencies in EISs (for instance, assessments presented in EIS are incomplete, lacking in rigorous analysis, inadequate monitoring and mitigation proposals).
- Less developed techniques for follow-up relative to other components of EIA (for instance, limited knowledge about dose–effect relationships, baseline data and post-decision monitoring data are inadequate for the methods and techniques available).
- Organisational and resource limitations (for instance, monitoring may require much time, money, manpower and expertise).
- Limited support for conducting EIA follow-up (for instance, low priority of follow-up in comparison to new development proposals by proponents, regulators and (sometimes) public).
- Unclear benefits and insight into how to do EIA follow-up in a pragmatic and cost-effective way.
follow-up it is important to (re)think contextual factors and the role of the parties as depicted in Figure 1. In relation to this, Table 5 provides relevant points of attention. The success of EIA follow-up is contingent upon the contextual factors in which it operates. The interplay of regulations and institutional arrangements, approaches and techniques, resources and capacity, project type and stakeholder involvement determine follow-up outcomes.

EIA follow-up does not need to be complex or expensive to be successful. A pragmatic approach using common sense, in which due attention is paid to the various contextual factors seems likely to enhance success. Open communication between, and involvement of, the various stakeholders is essential in linking their interests and (potential) contributions to follow-up processes and outcomes.

For the proponent, it is important that follow-up is cost-effective, simple and practicable. For the regulator, it is important that follow-up requirements are enforceable and are useful for checking compliance and environmental performance. Furthermore, the knowledge gained by EIA follow-up should be disseminated, hopefully resulting in the improvement of EIA systems and practice. Finally, for the public, it is important that follow-up clearly demonstrates the environmental performance of an activity in their living environment and that their concerns are addressed. In return, their knowledge and involvement can make a valuable contribution to successful EIA follow-up.

Table 5. What makes EIA follow-up successful?

| Regulations and institutional arrangements | - Existence of a formal requirement for follow-up in the EIA system is an important prerequisite, although other regulatory mechanisms already in place may enable some follow-up to occur. |
| - Strong commitment by EIA regulators to undertake EIA follow-up is essential. |
| - Industry self-regulation and proponent voluntarism may be needed to fill the gaps in the regulatory framework. |
| - Public pressure is an effective driver for proponent- and regulator-led follow-up programmes. |
| - Education and capacity-building support for follow-up procedures is needed. |
| - Staff continuity in proponent and EIA regulator organisations from project planning through to implementation improves the effectiveness of follow-up activities. |
| Approaches and techniques | - Screening and scoping to ensure that follow-up is conducted for significant projects and adverse environmental issues. Not all pre-decision EIA promises and issues will need to be followed up. |
| - Use of existing data and monitoring activities for EIA follow-up. Simple monitoring techniques using the human senses and community participants may be all that is needed. However, some issues may require rigorous scientific monitoring approaches. |
| - EIA follow-up approaches need to be selected in accordance with the local ‘culture’ for EIA practice. |
| Resources and capacity | - EIA regulators need to have the staffing capacity and budgets to implement follow-up programmes. However, relatively simple and pragmatic approaches can enable existing information and project management resources to be used effectively to achieve follow-up outcomes. |
| - Proponents need to be committed to carrying out follow-up and ensure that appropriate action is taken. Responsibilities can be incorporated into contractor agreements and job functions of employees. |
| - Involvement of public can be a resource in its own right. Local community knowledge and feedback on project implementation plays an important role in ongoing project decision-making and in ensuring the success of follow-up. |
| - The local community and other stakeholders will welcome becoming involved provided that they are genuinely consulted and know they have a say in outcomes of follow-up programmes. |
| - Having sufficient resources to communicate EIA follow-up findings to stakeholders is essential. In addition to meetings, community discussions, access to information and printed material, use of the internet may be relevant. Internet-based reporting may offer more opportunity for public participation than traditional print-based media for jurisdictions where this technology is readily available. |
| Project type | - When determining follow-up programmes it is important to take into account project type with respect to large/small investment, long-term/short-term, spatial extent and whether it is strategic/operational in nature. |
| - For more complex or major projects informing and learning may be important outcomes in addition to controlling functions, which are relevant to all projects. |
| Parties/stakeholders | - Proponents should be made aware that EIA follow-up can be a useful instrument in project management and may lead to cost savings. |
| - Regulators should at least ensure that EIA follow-up is carried out properly (that is, in accordance with regulatory framework). |
| - At the very least, the public should be informed of follow-up outcomes, but direct involvement in follow-up programmes is desirable and beneficial for all stakeholders. |

References


Munro, D A, T J Bryant and A Matte-Baker (1986), Learning from Experience, a State-of-the-Art Review and Evaluation of Environmental Impact Assessment Audits (Canadian Environmental Assessment and Research Council, Minister of Supply and Services, Canada).


