

COMMUNITY GUIDE FOR MONITORING DEVELOPMENT PROJECTS

HEMANTHA WITHANAGE



Centre for Environmental Justice

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**National Endowment
for Democracy**

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CONTENTS

Acknowledgements	
Introduction.....	1
Monitoring as a legal requirement	4
Community and Civil Society monitoring	6
Types of Monitoring	7
Environmental Monitoring and Management Plans	11
Development of social and environmental Indicators	18
Environmental Audit	20
Conclusion	21
References	22

CENTRE FOR ENVIRONMENTAL JUSTICE(CEJ)

Centre for Environmental Justice is a public interest environmental organisation based in Sri Lanka working towards environmental justice and good Governance, established in 2004.

CEJ promotes Environmental Impact Assessment Process as a means to achieve environmental justice and public involvement in environmental decision making. CEJ involve in training various stakeholders on EIA process, EIA monitoring and involves in EIA related litigations among various other activities to conserve the environment.

NATIONAL ENDOWMENT FOR DEMOCRACY(NED)

National Endowment for democracy is a private, nonprofit foundation dedicated to the growth and strengthening of democratic institutions around the world. Each year, with funding from the US Congress, NED supports more than 1,000 projects of non-governmental groups abroad who are working for democratic goals in more than 90 countries.

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PREFACE

Experiences around the world shows that development has to have limits depending on the national needs, affordability of the people and availability of natural resources. Sustainable development was brought to the discussion since 1972 and globally accepted during the World Summit on Environment and Development held in 1992.

Sustainable development means balancing the environment and development. Environmental Impact Assessment is a tool to make this balance. However, EIA process has many loopholes that developers can escape.

Politicians in many nations use development for making money rather than fulfilling the development needs of the nation. Therefore, development monitoring should be a part of the communities, civil society and the regulators.

Environmental Management and Monitoring plan is a tool which use around the world to monitor that development do no harm to the people and the environment. While the countries have developed regulations, development banks have formulated safeguard polices, public disclosure and accountability mechanisms to regulate development.

It will be hard to benefit from such safeguards unless countries follow the good governance principles, which includes access to information, public participation, rule of law corruption and accountability.

I hope that public in general and the affected communities and the civil society organisations will involve in monitoring development once they gain some understanding, how they can engage in such a process.

I believe this publication will contribute to mobilize the interested parties to engage more and more pushing development meets public needs rather that fulfilling the dreams of corrupt leaders.

Hemantha Withanage
Executive Director
Centre for Environmental Justice

12 July 2015

1. DEVELOPMENT

Every country need infrastructure development to uplift the people's living and provides facilities for the citizens. Such development always required resources, space and interfere with society, culture and eco systems. The debate on environment vs development has been recognized by the nations and the international bodies in the past several decades and have developed regulations, tools, processes and system to balance the disputes. The countries, international bodies and financial institutions have also developed environmental and social safeguards to resolve such problems. Environmental Impacts Assessment Process is one such tool applies across the world.

The recent development projects such as Uma Oya Diversion, Yan Oya Diversion, Moragahakanda Diversion, Colombo Port City Development, Mattala Airport, Hambantota Harbour, Metro Colombo Urban Development Project etc., become so controversial due to disregard of the environmental regulations and negative social and environmental impacts generated at the design, implementation and operation stages. Such project either did not have an EIA/IEE or do not have an environmental monitoring mechanism.

2. DEVELOPMENT MONITORING

Development monitoring is a complex subject as it involves many different aspects. Human rights, access to information, participation, corruption, environmental and social safeguards and accountability are some of them. Most recent project has violated many of the above norms and principles.

Therefore, it is vital to have a broader development monitoring mechanism if one has to ensure that projects have total social and environmental acceptance in the society. Once establish a true "democratic governance" with above norms and safeguards, it will ensure that development takes place in true meaning of meeting the societal needs rather than fulfilment of the individual dreams. A further step can be achieved by reaching the "ecological democracy" by adding ecological concern into the democratic decision-making.

Our intention here is to provide some basics on monitoring the projects from social and environmental angle, which also linked to the EIA process.

3. ACCESS TO INFORMATION

Access to information is very much needed for project monitoring. Project design, EIA report, project approval, Environmental Management plan, Resettlements plans are some crucial document to ensure public disclosure principle.

Access to information is normally given under the Constitution, which empowered by a Right to information bill in other countries. Sri Lanka is the only country in South Asia, which do not have a Right to Information law yet. Multilateral Development Banks (MDBs) such as ADB, World Bank has the information disclosure policies which allows you to request the copies of the development related documents including the Environmental Impact Assessments.

According to the EIA regulations in Sri Lanka EIA/IEE is a public document. Once the EIA is open for public comments, it will be published in the newspapers and copies are available in selected places including the Central Environmental Authority and the relevant project approving agencies. However, other documents make public at the discretion of the approving agency.

4. PARTICIPATION

Public participation is an internationally accepted principle in all decisions. Electing parliamentary members by a democratic voting system or other mechanisms does not ensure the public participation in various decisions taken by the governments. Therefore, it is the rights and responsibility of the citizens to participate in development and other decisions time to time. Referendums, public petitioning, active participation in public meetings and opinion sorting bodies such as tribunals are crucial for making development acceptable to the public.

EIA regulations provide public participation during project scoping, EIA commenting, public hearings and during the appeal hearings. However, only 30 days public commenting is mandatory with regard to the EIAs. IEE is a public document however, no public commenting period is given.

4. RULE OF LAW

Along with the access to information and participation the rule of law or predictability is a major component to ensure good governance. This means that the rights, controls and protection given under the constitution and other laws have performed as predicted by the society in an unbiased manner. The rule of law is the legal principle that law should govern a nation, as opposed to being governed by arbitrary decisions of individual government officials. The government and its officials and agents as well as individuals and private entities are accountable under the law. This principle is very much relevant development monitoring.

5. ACCOUNTABILITY

Webster's defines "accountable" as "subject to having to report, explain or justify; being answerable, responsible." Accountability in development projects ensures that the project proponents, project approving agencies, funding agencies, project staff and the government bodies including the parliamentary and the executive powers are answerable to the society. One should not forget that individual accountability leads to the institutional accountability and the societal accountability.

6. CORRUPTION

Webster's defines Corruption as "dishonest or illegal behaviour especially by powerful people such as politicians, government officials or police officers. The act of corrupting someone or something is not acceptable in societal norms.

Corruption happens in planning, design, approval, implementation, construction and operation stages in a development project cycle. Corruption can lead to decision changing, abuse of power, misuse of public money, biasness and even make unsustainable and faulty development to make such development a burden to the nation. Corruption is highly visible in most countries which follows the open economic principles and developing countries including Sri Lanka, due to lack of precautions, principles, regulations and the dishonesty in powerful sectors and over tolerance of the society.

7. MONITORING AS A LEGAL REQUIREMENT

Large scale development projects requires to produce and initial Environmental Examination (IEE) or Environmental Impact Assessment (EIA) to obtain the project approval by the respective project approving agencies for prescribed projects. National Environmental (Procedure for Approval of Projects) Regulations, No. 1 of 1993 as contained in Gazette Extra-Ordinary No 772/22 of 24th June 1993 and No 1159/22 of 22nd November 2000 gives the required legal basis for this requirement.

8. MONITORING PLAN

The monitoring plan including the indicators, frequency of monitoring, responsible persons and the cost of monitoring should be produced by the Project Approving Agency.

Section 13. Upon receipt of such responses as referred to in regulation 12 above, the Project Approving Agency shall with the concurrence of the Authority, within thirty days either –

- i. grant approval for the implementation of the proposed project subject to specified conditions: or*
- ii. refuse approval for the implementation of the proposed project with reasons for doing so.*

It shall be the duty of all Project Approving Agencies to forward to the Authority a report which contains a plan to monitor the implementation of every approved project, within thirty days from granting of approval under regulations 9 (i) and 13 (i) by such agencies.

'The Project Approving Agency shall publish in the Gazette and in one national newspaper published daily in the Sinhala, Tamil and English languages the approval of any project as determined under regulations 9 (i) and 13(i) hereto.

- i. The Project Approving Agency shall specify a period within which the approved project shall be completed.*
- ii. A project proponent may, within thirty days prior to the expiry of such period, make an application in writing to the Project Approving Agency for an extension of time for the completion of the proposed prescribed project*

(Source: <http://cea.lk/web/images/pdf/eiaregulations/reg772-22.pdf>)

Once the EIA/IEE has been approved through the EIA process it required continuous monitoring at the design, construction and operation stages. However, often times there is no project monitoring done by the relevant project approving agencies. Monitoring environmentally sensitive project is very important to make sure that it does not cause unnecessary harm to the environment and to ensure proper implementation of the mitigatory measures during the project cycle. This tool provides a key aspect of project monitoring for those agencies and the public to engage in project monitoring.

Environmental impact monitoring must be conducted to fulfil the following objectives:

1. Check the implementation of mitigation measures to see whether it is in conformity with the environmental impact assessment report and conditions of approval.
2. Ensure that the impact does not exceed legal standards.
3. Provide timely warnings of potential environmental damages.

9. PUBLIC COMMENTS

Once the EIA is open for public comments it is the responsibility of the interested parties including the affected communities to produce and send comments to the relevant agency. These comments can be very useful for post-approval monitoring. You can compare the approval given by the project approving agency with your comments to begin monitoring.

10. WHO IS RESPONSIBLE FOR MONITORING?

Monitoring can be done formally and informally. Affected communities, concerned citizens, government agencies, project partners can engage in project monitoring.

Formal monitoring is done by the project approving agencies. Project Approving agencies and the Central Environmental Authority has the formal responsibility to monitor the project once the approval is given. In the Coastal zone it will be the responsibility of the Coast Conservation Department. In the North Western Province this responsibility lies with the North Western Provincial Environmental Authority.

11. COMMUNITY/CIVIL SOCIETY MONITORING

Informal project monitoring can be independently done by the local affected community, civil society organizations, media or people with such interest to see how the project is impacting the social and environmental norms in the country or in the location. This does not require special expertise, but only adequate interest. This can be best done by organizing the community or workers.

Generally, the public is not directly involved in the development of the EMP. Rather, public issues and concerns expressed during the EIA process are incorporated into the EMP. A way of eliciting public comment on the EMP is to present it in the Environmental Impact Report (EIR). At this early stage it would be difficult to present a comprehensive EMP. A “framework” EMP included as part of the EIR can highlight key environmental issues and identify appropriate mechanisms to deal with these issues. It would allow members of the public an opportunity to comment on the mitigation and monitoring specifications. Since many of the environmental controls are designed to mitigate potential impacts on neighbouring communities, the public may provide a specific monitoring role to ensure that they are not being unduly affected by the proposed activities. An Environmental Monitoring Committee (EMC) or Environmental Liaison Committee may be established to monitor progress and performance. Interaction between the community and the company is essential to build levels of confidence and trust.

12. PARTICIPATORY MONITORING

Post approval monitoring can be best achieved by engaging participatory monitoring at filed level. In most cases the local communities, civil society organizations, environmental concerned citizens are ready to put their voluntary efforts to monitor the negative impacts of a project. If this interest can be harnessed, the regulatory agencies can set up a formal- informal mechanism to better monitor the projects.

For this purpose it is important to set up a consultative process at the filed level. A responsible civil society contact person need to be identified in consultation with the local communities in a transparent process. He/she should be accountable to the people and should bring the local voices, concerns and experiences to the formal monitoring process.

Following are some steps to agree an informal participatory monitoring process.

- * Identify committed leadership in the area.
- * Identify local stakeholder groups.
- * Agree on the role and responsibilities of the monitoring set up.
- * Identify key indicators to monitor (It is advisable to agree only social and some key environmental indicators to be monitored. Leave the scientific monitoring indicators to the responsible agencies).
- * Identify the key violations compare monitoring results with the conditions in the approval.(in case you don't have a copy of the conditional approval, you may demand a copy from the relevant agencies).
- * Keep records of monitoring results.
- * Produce a monthly or quarterly reports as you may think suitable.
- * Share and communicate the reports with agencies involve in formal monitoring through your leadership.
- * Share this report with the other stakeholders and media if you agreed so.

13. FORMAL MONITORING

Following are the basic principles for formal project monitoring

- a. Determine the indicators to be used in the process of monitoring.
- b. Collect important and relevant information.
- c. Apply measurable criteria with regard to prescribed indicators.
- d. Conduct objective analysis of the information collected.
- e. Workout clear conclusions based on objective analysis and processed information.
- f. Make rational decisions based on the conclusions drawn pursuant to above (a) to (e)
- g. Recommend improved mitigation measures to the implementing agency

14. TYPES OF MONITORING

There are three levels of monitoring can be considered in a project monitoring mechanism. They include baseline monitoring, impact monitoring and compliance monitoring.

15. BASELINE MONITORING

Prior to the initiation of construction activities for the proposed project, surveys should be conducted of construction site and basic environmental parameters of the surrounding areas. This would help subsequent monitoring to identify changes in those parameters compared to the baseline. This can be done in the feasibility and EIA preparation stage and prior to the project implementation. The area could be depending on the type of impacts. For eg. Air pollution needs to be monitored several kilometers from the project location, however soil quality can be monitored only in the surrounding of the project site.

16. IMPACT MONITORING

The ecological, social, economic and public health parameters within the project impact area must be measured during the project construction and operation phases in order to detect environmental changes which may have occurred as a result of project implementation. Similar to the above the monitoring area should be identified based on the type of parameter.

17. COMPLIANCE MONITORING

All EIA/IEEs often approved with conditions. It comes in a letter of permit. Following are the 3 types of compliance can be expected in this regard.

1. Compliance with Permit conditions
2. Ensure implementation of Mitigation measures
3. Compliance with standards

The permit conditions are drawn based on the mitigation measures given in the EIA chapter on mitigation and based on the suggestions by the stakeholders and the technical evaluation committee.

Complacence standards includes water quality standards, air quality standards, noise quality standards etc., stipulated by the Central Environmental Authority, Sri Lanka Standards Institution or such other agencies time to time.

18. EFFECTIVENESS MONITORING

Effectiveness monitoring can play a key role in demonstrating the accountability, success, and value of investments. Effectiveness monitoring is designed to determine if the project is effective at meeting its objectives. There is an important distinction between the questions “was the project implemented in the manner, time, and budget as proposed?” and “did the project achieve the larger objective it was designed to meet?”

Project-scale effectiveness monitoring measures environmental parameters to ascertain whether the mitigations measures were effective in creating a desired change. There are at least three important reasons to conduct project-scale effectiveness monitoring on a mitigation action or a change in management:

- * to determine the changes resulting on, and adjacent to, the project area,
- * to determine if the project actions were effective in meeting the objective, and
- * to learn from the experience and incorporate new knowledge in future design.

Effectiveness monitoring should follow established protocols, be statistically valid, generate quantifiable data, and produce results that, when tested, are repeatable.

19. MONITORING FREQUENCY

Regular Monitoring is required to obtain necessary data and information in order to draw accurate conclusions concerning the impacts of the project. Certain parameters may require daily monitoring. Some agencies conduct quarterly monitoring of some parameters and some in an annual monitoring.

20. INTENSITY OF MONITORING

In order to make the environmental monitoring a success as anticipated, it should be granted proper importance in the project cycle. At the scoping, most important and critical parameters that could influence the project and its surrounding environment should be specified. The extent to which monitoring ought to be intensified should be determined on the basis of potential severity of the environmental impact.

21. TYPES OF ENVIRONMENTAL MONITORING PLANS

There are three broad categories of EMPs (DEAT 2004) in the project life cycle: the construction EMP, the operations EMP and the decommissioning EMP. The objectives of these EMPs are all the same, namely to:

1. identify the possible environmental impacts of the proposed activity; and
2. develop measures to minimise, mitigate and manage these impacts.

The difference between these EMPs is related to the difference in mitigation actions required for the different stages of the project cycle.

22. THE CONSTRUCTION PHASE EMP

The construction phase EMP provides specific environmental guidance for the implementation and construction phase of a project. It is intended to enable the management and mitigation of construction activities so that environmental impacts are avoided or reduced. These impacts range from those incurred during start up (e.g. site clearing, erection of the construction camp) to construction activities (i.e. erosion, pollution of watercourses, noise, dust). Information presented in the EMP is typically categorised as follows:

- * identify the specific activity or potential impact that requires management;
- * determine the mitigation measures to be implemented;
- * identify the performance indicator;
- * identify who would be responsible for implementation; and
- * identify who would be responsible for monitoring.

23. THE OPERATIONAL PHASE EMP

The operational phase EMP provides specific guidance related to the operational activities associated with a particular development. The roles and responsibilities for mitigation, monitoring and performance assessment for the operational life of the development are specified in the EMP.

24. THE DECOMMISSIONING PHASE EMP

The Decommissioning Phase Environmental Management Plan As the final phase in the project cycle, decommissioning may present positive environmental opportunities associated with the return of the land for alternative use and the cessation of impacts associated with operational activities. However, depending on the nature of the operational activity, the need to manage risks and potential residual impacts may remain well after operations have ceased. Examples of potential residual impacts and risks include contamination of soil and groundwater, stock that has been abandoned (e.g. oil drums, scrap equipment, old chemicals) and old (unserviceable) structures. The decommissioning phase EMP provides specific guidance with respect to the management of the environmental risks associated with the decommissioning stage of a project. The decommissioning phase EMPs are typically encountered within extractive industries such as minerals mining and oil and gas exploration and extraction.

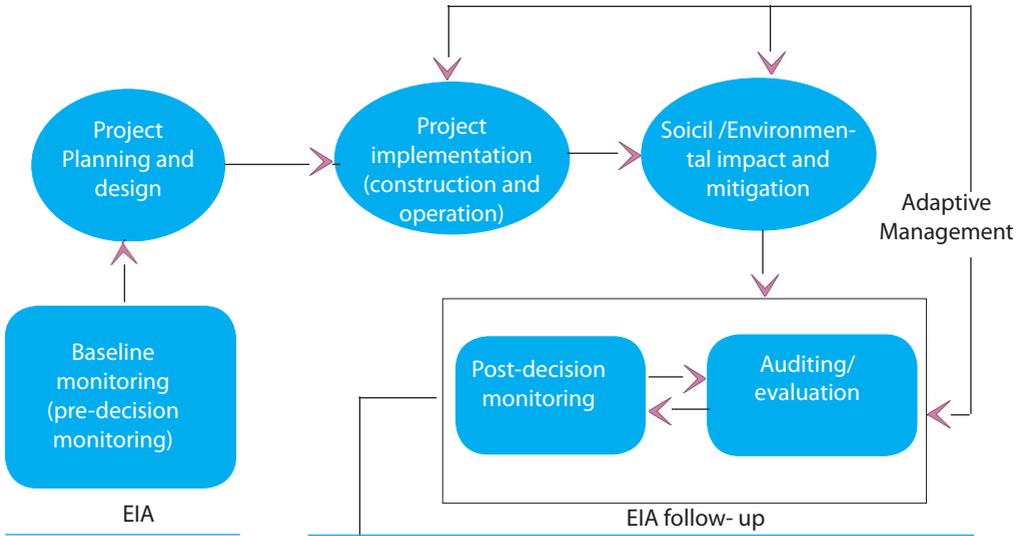
25. ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN

Environmental Management and Monitoring Plan defines desired outcomes and actions to address identified impacts and risks, and meet applicable requirements as measurable events to the extent possible. It also discusses the measures for information disclosure, the grievance redress mechanism, and the process for continued consultation with and participation of affected people during project implementation.

There is no universally accepted standard format for EMPs. The format needs to fit the circumstances in which the EMP is being developed and the requirements which it is designed to meet (World Bank, 1999). According to the World Bank (1999) EMPs should contain the following components:

- * **Summary of Impacts:** The predicted negative environmental impacts for which mitigation is required should be summarized.
- * **Description of mitigation measures:** The EMP identifies feasible and cost effective mitigation measures to reduce significant negative environmental impacts to acceptable and legal levels. Mitigation measures should be described in detail and be accompanied by designs, equipment descriptions, and operating procedures. The technical aspects of implementing the mitigation measures should be described.

26. ENVIRONMENTAL POST-DECISION MONITORING PROGRAM



- MONITORING MAIN GOALS**
- * Stakeholders involvement
 - * Inputs to future/similar EIS
 - * Evaluation of mitigation measure effectiveness
 - * Environmental management systems linkage
 - * Own project environmental performance evaluation
 - * Validate impact predictions

- MAIN COMPONENTS OF A MONITORING PROGRAM**
- * Define objectives/targets
 - * Select and develop monitoring indicators
 - * Evaluate data requirements and data availability
 - * Define sample strategy, including sampling sites and time frequency
 - * Define methods for collecting and analyzing data, and assessing information
 - * Define methods of communicating and reporting results outputs
 - * Define reviewing procedures and indicators of monitoring performance evaluation

Source: Environmental indicator frameworks to design and assess environmental monitoring programs By Tomás B. Ramos , Sandra Caeiro & João Joanaz de Melo



- * **Description of monitoring programme:** Environmental performance monitoring should be designed to ensure that mitigation measures are implemented. The monitoring programme should clearly indicate the linkages between impacts, indicators to be measured, measurement methods and definition of thresholds that will signal the need for corrective actions.
- * **Institutional arrangements:** Responsibilities for mitigation and monitoring actions should be clearly defined.
- * **Legal enforceability:** The key legal considerations with respect to EMPs are: Legal framework for environmental protection; and Legal basis for mitigation.
- * **Implementation schedule and reporting procedures:** The timing, frequency, and duration of mitigation The measures should be specified in an implementation schedule, showing links with the overall project.
- * **Procedures to provide information:** on the progress and results of mitigation and monitoring measures should also be clearly specified.
- * **Cost estimates:** Costs should be calculated for both the initial investment and recurring expenses for implementing the mitigation measures.

After the feasibility and design stages of the project, those projects, which have significant negative impacts are subjected to EIA. For projects of the type, which are undertaken frequently and which require authorisation, it may be advisable to develop the EMP as part of the Environmental Impact Report. This ensures that mitigation, monitoring and management considerations form part of the documentation used for decision-making. This has the benefit of giving the authority some assurance that mitigation measures proposed during the EIA will be implemented during the construction and operation phases of the project. The benefits of including the EMP as part of EIA (EIA Newsletter, 1996) are:

- * encouraging applicants to be more systematic and explicit in the design and development of mitigation measures and the intended means of implementation;
- * encouraging authorities to check the practicality and likelihood of implementation of mitigation and monitoring measures;
- * ensuring that the mitigation measures are properly incorporated into the project design and contract documentation after authorisation is granted;
- * encouraging the project proponent to meet the requirements of the EMP which now form the basis for the conditions attached to authorisation of the project; and
- * forcing the project proponent to internalise environmental impacts that would otherwise become a social cost.

28. GUIDANCE FOR THE FORMULATION AND IMPLEMENTATION OF EMPS

1. Obtain a comprehensive understanding of the activities and associated impacts of all the phases of the project. Appropriate mitigation and monitoring measures can then be implemented.
2. Identify specific environmental risks and issues. This entails identifying the elements of the environment that need to be protected as well as the range of activities that could possibly adversely affect them.
3. Develop the suite of environmental controls and, ideally, prepare these as a set of specifications for integration into the construction tender or contract document. These environmental controls will include the mitigation measures, management controls, and environmental standards to be met.
4. When designing the EMP, questions to ask include: What is the scale of the construction and operational activities? How sensitive is the receiving environment? What are the potential environmental risks?
5. The mitigation measures must be practical and cost efficient so that they are readily implementable.
6. Method statements are useful tools for the contractor to specify how mitigation actions will be implemented. Method statements describe: Construction and operational procedures; Materials and equipment to be used; How and where material will be stored; Action to contain leaks or spills of any liquid or material; The timing and location of construction and operational activities;
7. Identify and allocate roles and responsibilities for specific actions associated with mitigation, monitoring and performance assessment.
8. Establish a monitoring programme.
9. Specify the mechanisms for achieving compliance (i.e. rewards and penalties)
10. Develop an environmental awareness programme

29. EXAMPLE OF A FORMAT FOR DATA COLLECTION AND MONITORING

<i>Environmental component</i>	<i>Monitoring Frequency</i>	<i>Monitoring Method</i>	<i>Data Capture</i>	<i>Remedial method</i>
Ground water				
Monitoring bore holes	Monthly	Water levels taken and translated to height datum. Flow rates and pump rates and flow meter reading taken.	Capture data in spreadsheet. Calculate salinity. Trends analyses every month	
	six monthly	Samples taken for major ion analysis.	Capture data in spreadsheet. Trends analyses every six months	
Terrestrial Ecology				
Rehabilitation: plan establishment	Survey re-vegetated area every six months	Density of seedlings measured. Survey area every six months.	Capture data in spreadsheet. Use graphs to illustrate trends	Remedial action as required.
Rehabilitation: plant species diversity	Survey plots once a year	Record number of indigenous plant species in selected plots	Capture data in spreadsheet. Use graphs to illustrate trends.	Remedial action as required
Fauna	Six monthly	7 sites 2 transects	Record species present. Capture data in spreadsheet. Use graphs to illustrate trends.	
Feral animal control	Inspect for feral animals every two days.	Control feral animals by trapping, baiting or shooting as recommended by conservation authorities.	Areas where feral animals have been trapped or baited are inspected every two days.	If method of control is not successful further trapping or baiting is carried out.
Avifauna				
	Survey bird pairs during breeding and nesting periods	Record breeding, nesting and survival success.	Capture data in spreadsheet. Use graphs to illustrate trends	

Source: DEAT (2004) *Environmental Management Plans, Integrated Environmental Management, Information Series 12, Department of Environmental Affairs and Tourism (DEAT), Pretoria.*

30. CRITERIA FOR SELECTING INDICATORS

This category of monitoring performance indicators may be viewed as a response and management category linked with the organization responsible for the monitoring program, where the target is the post-decision monitoring system. This should be distinguished from response-type indicators, which describe the responses of the project proponent/society as a whole and in which the targets are the environmental, social and economic systems.

Framework should be designed to cover the main stages of project implementation: construction; operation; and decommissioning. Five fundamentals support monitoring indicator system development:

- * Project type and dimension;
- * Baseline environmental sensitivity;
- * Major significant environmental impacts identified/predicted and related mitigation measures;
- * Impacts that have poor accuracy or lack of basic data; and
- * Other environmental monitoring programs near the project area.

To relate the results from post-decision monitoring to the pre-decision monitoring a comparison is essential. The pre-decision monitoring could be ideally developed using the same pressure, state, effects and response categories, for a more efficient comparison, although the pressure indicators should consider the existing pressures without project.

31. DEVELOPMENT OF SOCIAL & ENVIRONMENTAL INDICATORS

Besides the main criteria presented above for monitoring indicator selection and development, various concepts, criteria and general guidelines must also be taken into account. (Tomás B. Ramos , Sandra Caeiro & João Joanaz de Melo 2004)The implementation of indicators therefore requires the definition of a set of indicators aimed at the different parts of the framework. Some of the most important criteria for indicator selection are:

- * Social and environmental relevance;
- * Ability to provide a representative picture of significant environmental impacts;
- * Simplicity, ease of interpretation and ability to show trends over time;
- * Responsiveness to change in the environment and related project actions;
- * Capacity to give early warning about irreversible trends;
- * Ability to be updated at regular intervals;
- * Present or future availability at a reasonable cost/benefit ratio;
- * Appropriateness of scales (temporal and spatial);
- * Acceptable levels of uncertainty;
- * Data collection methods comparable with other data sets;
- * A good theoretical base in technical and scientific terms.
- * Existence of a target level or threshold against which to compare it, so that users are able to assess the significance of the values associated with it;
- * Minimal environmental impact of the sampling process itself.

32. DEVELOPING A MONITORING PROGRAMME

Environmental monitoring provides the data for review, checking and revising the EMP. By instituting regular monitoring, environmental impacts can be detected early and remedial action implemented (EPA, 1995b). The process for establishing a monitoring programme consists of the following actions:

- * specify management objectives;
- * specify monitoring objectives;
- * identify the scope of monitoring;
- * recommend appropriate monitoring technology;
- * specify how the information collected should be used in decision-making;
- * define the spatial boundaries and select map scales and sites for observation, measurement or sampling;
- * select key indicators for direct measurement, observation or sampling;
- * define how the data will be analysed and interpreted and how it should be presented in monitoring reports;
- * define the precision and accuracy required in the data;
- * consider compatibility of data to be collected with historical data and with related contemporary data; and
- * set minimum requirements for monitoring. The monitoring actions described above fits within the overall process of developing the EMP, monitoring programme and performance assessment .

33. MONITORING AND DATA COLLECTION

The monitoring programme should detect trends and changes to enable intervention or remedial measures to be taken in order to achieve good environmental performance. Within each environmental component or specialist area (e.g. groundwater, terrestrial ecology and avifauna) there are appropriate techniques for collection, analysis and interpretation of data. The criteria that need to be employed for effective data collection, management and reporting include:

- realistic sampling programme (temporal, spatial and point data);
- collection of quality data;
- compatibility of new data with historical data;
- cost effective data collection;

- quality control in measurement and analysis;
- appropriate databases to capture, store, retrieve and display the data; and
- reporting for internal management and external auditing.

Ideally, the monitoring data should be presented in the form of maps, photographic records, data tables and graphs. An example of a format for data collection and monitoring is given in the table below.

34. ENVIRONMENTAL AUDIT

Conducting of the Environmental Audit will ensure the project is compliant with Environmental regulations. The implementor should be expected to carry out an Environmental Audit and prepare an Environmental Audit report based on the agreed environmental audit principles.

An Environmental audit is a systematic, documented, periodic and objective process in assessing an organization's activities and services in relation to:

1. Assessing compliance with relevant statutory and internal requirements
2. Facilitating management control of environmental practices
3. Promoting good environmental management
4. Maintaining credibility with the public
5. Raising staff awareness and enforcing commitment to departmental environmental policy
6. Exploring improvement opportunities
7. Developing an Environmental Management and mitigation plan complete with mechanisms for monitoring and evaluating compliance including cost of mitigation measures and time frame for implementing the measures.

35. CONCLUSION

True development monitoring will take place once the society is vigilant on information, participation, rule of law, accountability and corruption. It will also require society is serious about collective role and responsibility to ensure development takes place only to meet the true needs of the society.

Monitoring is very crucial to ensure that development is taking place making no harm to the environment and the society. It also ensures adhering to the conditions given by the regulating agency through a consultative process. Post-decision monitoring is an essential step in the EIA process if the predicted impacts, the efficiency of mitigation measures and the shortcomings of prediction methods, measures and even regulations are to be verified and to ensure that project do not make unnecessary harm. However, post-decision monitoring programs within EIA particularly due to financial and time constraints and negligence by the proponents and the approving agencies.

Environmental Monitoring and Management plan in various stages of the project cycle is a way to make this monitoring in a transparent and accountable manner. The baseline monitoring data and the preconditions to support the monitoring-indicators system is fundamental to assure that the pressure on environment, state of environment, effects and responses categories assess project activities.

Correcting environmental degradation is ultimately much more costly than monitoring and degraded ecosystem or damaged social system may never return to pre-project levels. Community monitoring and reporting make easier for the general public to see the problems earlier and correcting them in advance. It will also facilitate proper enforcement of the EIA regulations.

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