

## **Environmental Monitoring and Compliance Methodology**

### ***Developed through Lessons Learnt from Oil & Gas Companies in Cameroon***

*Juliet Taza-Asaba*

#### **Abstract**

Defined as a way of tracking and addressing changes in the biophysical and social environment during project implementation, Environmental Impact Assessment follow-up also called Environmental Monitoring and Compliance is a legal requirement. According to Cameroonian EIA regulations, Environmental Management Plans elaborated during the Impact Assessment process, should be subject to administrative and technical surveillance as defined by article 27 of decree n° 2013/0171/PM of 14<sup>th</sup> February 2013 (replacing decree n° 2005/0577/PM of 23/02/2005) on the modalities for carrying out EIAs. In addition, the World Bank's 1988 Operational Directives on Environmental Guidelines requires periodic and annual EIA follow-up, while Article 20 of Operational Policy 4.01 outlines monitoring requirements for projects subjected to World Bank funding. Environmental Monitoring therefore helps mitigate and address all the foreseeable and unforeseeable environmental and social impacts of proposed projects thus closing the gap created by condition setting, predicted impacts and impacts that actually occur. In Cameroon, the methodology adopted for the realization of EIA follow-up differs on a case by case basis and from sector to sector. This paper seeks to present the methodology employed in EIA follow-up of some key Onshore Oil and Gas sector projects. The paper intends to draw from experience and lessons learnt during EIA follow-up, highlighting the specific day to day environmental performance indicators that enabled the gap between impact prediction during EIA and impact occurrence during EMP implementation and follow-up to be closed.

#### **INTRODUCTION**

##### ***General Overview***

The realization of Environmental Impact Assessments (EIA) used synonymously as Environmental and Social Impact Assessment (ESIA) is a prerequisite for the kickoff of Petroleum Exploration and Production (E&P) operations in Cameroon, while Environmental Audits are required for ongoing installations of the same nature. EIA implementing texts subject petroleum exploration and production to detailed ESIA. From 2008 to 2013, CIME Services has carried out ESIA's and Environmental Audits for ~80% of Petroleum Companies working in Cameroon. The above mentioned period, has been marked by the realisation of close to 29 different (ESIA) and 3 Environmental Audits for different Petroleum E&P Companies operating in Cameroon, such as ADDAX Petroleum Cameroon Limited, EUROIL Ltd., Perenco Cameroon SA., TOTAL E&P Cameroon, etc. Some of the ESIA were carried out in partnership with some international Environmental Consultancy firms (For example CSIR and ERM of South Africa, Royal Haskoning of the Netherlands, and CSA of the USA). Out of these companies, ESIA follow-up through Environmental Monitoring and Compliance has been done for the following companies as indicated on the table below:

Table 1: Companies where Environmental Monitoring and Compliance has been undertaken

Year	Company	Project Type	Project Location	Outcome
2008-2012	Perenco Oil and Gas	ESIA for Exploration Drilling Operations in the Kombe-Nsepe Permit	Douala Edea Wildlife Reserve (Onshore)	ESIA follow-up through Environmental Monitoring and Compliance
2008-2009	GLENCORE Exploration Cameroon Ltd	EIA for proposed shallow water seismic survey in the Matanda block, offshore Cameroon	Douala estuary	Prior and ongoing community sensitization and information with key stakeholders throughout the project's life cycle
2008-2010	Rodeo Development Ltd	ESIA in preparation for onshore drilling operations in the Logbaba Block	Douala Sedimentary basin (Onshore)	ESIA follow-up through Environmental Monitoring and Compliance
2009-2010	Kosmos Energy Cameroon HC	ESIA for 3D Seismic Survey in the Ndian River Block within the Rio Del Rey sedimentary basin	Mokoko Forest River Reserve, Rio Del Rey Basin (Onshore)	ESIA follow-up through Environmental Monitoring and Compliance
2010	GLENCORE Exploration Cameroon Ltd	ESIA for 2D seismic survey operations in the Matanda block, Cameroon	Douala Sedimentary Basin (Onshore)	Prior and ongoing community sensitization and information with key stakeholders throughout the project's life cycle
		ESIA for a proposed 3D seismic survey in the Bolongo block, offshore Cameroon	Rio Del Rey basin (Offshore)	Prior and ongoing community sensitization and information with key stakeholders throughout the project's life cycle
2010-2011	Rodeo Development Ltd	ESIA for Development, Production and Pipeline Building Activities, Logbaba Gas field, onshore Cameroon	Douala Sedimentary basin (Onshore)	Prior and spontaneous community sensitization and information with key stakeholders throughout the project's life cycle
2010-2011	Yan Chang Logone Development Company	ESIA for proposed onshore exploration drilling of the Zina-1X well in the Zina block, Far North Region, Cameroon	Logone Birni Basin (Onshore/ Designated Wetland)	-ESIA follow-up through Environmental Monitoring and Compliance -Prior and ongoing community sensitization and information with key stakeholders throughout the project's life cycle
2011	Glencore Exploration Cameroon Limited (GECL)	ESIA for exploration drilling operations in the Matanda Block	Douala estuary	Prior and spontaneous community sensitization and information with key stakeholders throughout the project's life cycle
		ESIA for exploration drilling operations in the Bolongo Exploration Block	Rio Del Rey basin (Offshore)	Prior and spontaneous community sensitization and information with key stakeholders throughout the project's life cycle
2012-till date	Kosmos Energy Cameroon HC	ESIA for Exploration Drilling of the Sipo# 1 Well in the Ndian River Block	Rio Del Rey Basin; in the Mokoko Forest Reserve (Onshore)	-Ongoing Environmental Monitoring and Compliance -Elaboration and implementation of a Stakeholders Engagement Plan

According to the Cameroonian legislation on Impact Assessments (Environmental Audits, Environmental Impact Assessments, Environmental Notices, Strategic Environmental Assessments), the key outcome is the elaboration of Environmental Management Plans (also called Environmental and Social Management Plan). EMP implementation and follow-up through Environmental Monitoring and Compliance (EMC) is therefore the corner stone of the Impact Assessment (IA) process and helps identify and mitigate both foreseen and unforeseen impacts. Without IA follow-up, IA remains a paper exercise used to secure project approval rather than guarantee Environmental Sustainability. Based on CIME's understanding, IA follow-up has two main interrelated components: EMC and Stakeholders Engagement, thus this paper provides an insight into EMC, which incorporates the stakeholders engagement process. This paper mainly seeks to present the methodology employed in EIA follow-up of some key Onshore Oil and Gas sector projects and draw from experiences and lessons learnt during EIA follow-up to highlight the specific day to day environmental performance indicators that enabled the gap between impact prediction during EIA and impact occurrence during EMP implementation and follow-up to be closed.

#### **OBJECTIVES OF EIA FOLLOW-UP**

EIA follow-up is intended to 'close the loop' of impact prediction and condition setting (UNEP, 2002) and has the following as objectives: set up conditions for the identification of the impacts that occur; check that the impacts that occur are within the levels predicted and required by legislation; properly implement mitigation measures and determine that mitigation measures work effectively; and ensure the achievement of expected environmental benefits.

## **DEFINITION OF KEY CONCEPTS RELATED TO EIA FOLLOW-UP:**

Au and Sanvicens (1997) and Sadler (1998, 1998) defined the following terminology (tools):

- **Surveillance:** Regular, periodic site inspections to check compliance, observe progress and discuss issues,
- **Supervision:** Intensive direction of environmental performance on site, ensuring activities are carried out in accordance with the EMP and contract specifications,
- **Monitoring:** Collection of data, series of repetitive measurements of environmental parameters which could involve:
  - **Baseline monitoring:** Pre-project data collection to determine reference point
  - **Effects monitoring:** Environmental parameter measurements during project realisation to detect project related changes
- **Compliance monitoring:** Periodic sampling or continuous measurements of environmental parameters to ensure regulatory requirements and standards are met
- **Environmental Audits:** Systematic verification to ensure EIA procedures and outcomes correspond to objectives and requirements using data from surveillance, supervision, monitoring, etc.
- **Implementation Audits:** Compliance audits (standards and regulations), Impact Audits (accuracy of impacts), Policy Audits (consistency)
- **Evaluation:** Effectiveness (good practice) and performance (outcomes) in terms of sustainability
- **Post project analysis:** Effectiveness and performance checks using impacts, mitigation data from surveillance, monitoring and auditing

## **LEGAL CONTEXT**

### **INTERNATIONAL CONTEXT**

In terms of the international legal framework for EIA Follow-up or EMP implementation, the following conventions, policies and guidelines provide an overview.

- Espoo Convention on Trans-boundary Impacts imposes EIA follow-up;
- The World Bank's 1988 Operational Directives (OD) Environmental Guidelines requires periodic and annual EIA follow-up. Additionally, Article 20 of Operational Policy 4.01 outlines monitoring requirements;
- The UK-IEMA has developed EIA follow-up guidelines as part of best practice; and
- The European Bank for Reconstruction and Development (EBRD) in 1991 developed an Environmental Policy Guideline with 10 performance requirements involving monitoring and follow-up. Article 27 of the Environmental Policy imposes monitoring until loan has been paid back.

### **NATIONAL CONTEXT**

According to Cameroonian EIA regulations, Environmental Management Plans elaborated during the Impact Assessment process should be subject to administrative and technical surveillance (as defined by article 27 of decree n° 2013/0171/PM of 14<sup>th</sup> February 2013 on the modalities for carrying out EIAs). From 1996 to 2005, the regulations on Environmental Monitoring and Compliance were rated almost absent in Cameroon. Decree N° 2005/0577/PM simply mentioned the need for EMP implementation in Chapter IV (articles 18, 19 and 20) through administrative and technical surveillance and the production of a joint report which could result to the prescription of additional mitigation measures, thus readjusting the EMP. While article 20 gave the possibility for the administration in charge of the Environment to call on private expertise in line with the procedures of establishing public contracts. Whereas, since February, 2013, decrees n° 2013/0171/PM and n° 2013/0172/PM of the 14<sup>th</sup> of February 2013 respectively regulating the realisation of ESIA and Environmental Audits, not only require EMP implementation, but demand the production of semester reports by bodies or companies for projects whose implementation has been subjected to IAs.

### **Review of the Local Context of Environmental Monitoring and Compliance**

According to Nguene *et al.*, 2012, successful implementation of the mitigations measures requires that policies and institutions be strengthened to facilitate adequate follow-up. All stakeholders: consulting firms, NGO, the local population within the project area of influence and decision makers play a very important role in the attainment of the objectives of EIA. Some NGOs in Cameroon have analysed the efficiency of IA follow-up. According to Global Village, the Lom-Pangar Hydroelectricity Dam Construction project in Cameroon deplored the absence of operational mechanisms for follow-up and the lack of precision of the contents of a follow-up report. Equally, the absence of the local population and the civil society during follow-up was highlighted. The ECOVOX CIPCRE newspaper reported non-compliances and the lack of transparency in the monitoring of the

Chad/Cameroon pipeline project. According to their investigations, the reports of contractors indicated a good monitoring of the social impacts and mitigation/optimization measures on the ground, while NGO reports indicated many cases of non-compliance particularly with regards to compensation. Rainbow Environment Consult demonstrated that the inefficiency of EMP implementation follow-up goes beyond the absence of legal texts organising the activity. Other reasons associated are the lack of EMP implementation follow-up on the part of the administration due to the lack of financial resources allocated to monitoring missions for the MINEPDED and the unavailability of validated environmental monitoring and compliance methodology for the different industry sectors. These views on the issue of environmental monitoring and compliance of certain projects in Cameroon reveal that much remains to be done. These reflections drove CIME Services to associate follow-up of IA in the delivery of services to Oil and Gas and Mining Companies operating in Cameroon. Based on experiences and exchanges with both national and international environmental management practitioners, an adaptable methodology was defined and is currently being implemented during the realisation of some key oil and gas projects in Cameroon.

### EMC METHODOLOGY

It has been recognised that an effective EMC Programme should comprise of: Realistic sampling programmes, Sampling methods relevant to sources and types of impacts, targeted approach to data collection, comparability of data with baseline, quality control in measurements and analysis, Systematic record keeping and database organisation, Reporting requirements for internal and external checks, Provision for input from and response to third parties, and Presentation of results to the public. Some of these elements have been adapted within the framework of EMC by CIME Services, where it has been proven that for the petroleum sector, Environmental Monitoring and Compliance could be best carried out by the IA project supervisor who managed the entire process and thus maintains a good mastery of the environmental realities. Therefore, effectively EMC is carried out as follows:

#### ***Phase I: Preparatory phase/ Desktop (Pre-project component)***

The Pre-project component usually involves the appointment of the EMC team made up of an EMCO and if relevant a Community and Social Liaison Officer (CSLO) who must understand the key environmental requirements of each project activity. This comprises mainly, understanding the EMP and all associated project documents and defining monitoring parameters, frequency and the preparation of EMC Templates.

**Table 2: EMC Preparatory Phase**

Action to be undertaken	Key outcomes
Assembly and exploitation of documents/baseline data for setting of follow-up conditions Definition of monitoring parameters and frequency and preparation of EMC templates and reporting lines	
<b>Definition of roles and responsibilities</b>	<ul style="list-style-type: none"> <li>Appointment of EMP implementation team (EMCO, CSLO, HSE personnel, contractors...)</li> </ul>
<b>Review of Environmental Management Documentation</b>	<ul style="list-style-type: none"> <li>ESIA/Environmental Audit/EN Environmental Management Plans</li> <li>Public participation reports</li> <li>Results of Environmental baseline monitoring data</li> <li>Company internal audit procedures</li> <li>National and international laws, norms, procedures, policies, and standards</li> </ul>
<b>Review of Project Documentation</b>	<ul style="list-style-type: none"> <li>Detailed project design, activities, targets and deadlines</li> <li>Sectorial documents (types of drilling operations, associated activities, good practices in petroleum engineering...)</li> </ul>
<b>Preparation of subplans, templates for monitoring and reporting</b>	Follow-up templates/sub-plans include those for: <ul style="list-style-type: none"> <li>Wastes, discharges, emissions,</li> <li>Equipment calibration and maintenance,</li> <li>Complementary biodiversity assessments,</li> <li>Water quality monitoring,</li> <li>Ecosystem monitoring plans (Flora, Fauna, erosion control, access control...),</li> <li>Establish notices, flyers, and brochures (including notices on health/safety)...</li> </ul>

#### ***Phase II: Interactive phase (Implementation)***

This phase launches the EMC proper and involves the sensitization of the project team on the contents of the EMP, the legal requirements associated to the implementation of each mitigation measure and on the use of the different templates for monitoring and reporting. During this phase, discussions are carried out with stakeholders (local population, administration and other development organisations and operators) for the adoption of the templates. This is done by organising a roundtable for discussion with the project team to adopt the reporting templates and reporting lines, followed by its effective implementation.

**Table 3: EMC Implementation Phase**

Action to be undertaken	Key outcomes
<b>Sensitization of project team on EMP requirements</b>	<ul style="list-style-type: none"> <li>Meeting reports, Minutes of sensitization meetings, signed-off copies of EMP, MOU (if applicable)</li> </ul>
<b>Organisation of discussions with stakeholders for the adoption of reporting templates</b>	<ul style="list-style-type: none"> <li>Reporting templates improved and drafts finalized</li> <li>Continuation of stakeholder involvement process</li> </ul>
<b>Planning and execution of objectives and targets</b>	<ul style="list-style-type: none"> <li>Regular field visits and discussions with workers</li> <li>Planning and implementation of subplans and guidelines on waste management, oil spill clean-up, wildlife monitoring, access control</li> <li>Personnel training on the dispositions of the various subplans</li> <li>Feedback sessions with field workers like toolboxes, daily, weekly meetings with senior management ...</li> </ul>
<b>Data acquisition, database creation and document controls</b>	<ul style="list-style-type: none"> <li>Measurement of variables to determine existing conditions, variation and processes of change,</li> <li>Periodic sampling and continuous measurement of levels of discharges to ensure conditions are observed and standards met,</li> <li>Observation of the effects of changes in ecosystem services</li> </ul>

**PHASE III: REVIEW AND ADAPTATION PHASE**

This phase makes use of lessons learnt and gives room for continuous improvement.

**Table 4: EMC Review and Adaptation Phase**

PHASE III: REVIEW AND ADAPTATION PHASE	
Action to be undertaken	Key outcomes
<b>Internal and external audits Stakeholder engagement (Communication, participation, consultation...)</b>	<ul style="list-style-type: none"> <li>Obtain objective and/or confirmatory information and evidence to inform adaptation of EMP or monitoring methodology,</li> <li>Disclose (through reporting) and deliberate on information,</li> <li>Discuss and propose new and adaptive mitigation measures</li> <li>Inscribe new mitigation measures in the EMP masterfile and develop follow-up indicators,</li> <li>Improve on monitoring templates for emerging impacts.</li> </ul>
<b>Post-project implementation field visits</b>	<ul style="list-style-type: none"> <li>Preparation of project evaluation reports,</li> <li>inference and confirmation of all previously collected data and the review of reports for adaptation,</li> <li>Appraisal (socio-economic, biodiversity, etc.) reports</li> </ul>

**EMC REPORTING REQUIREMENTS AND LINES**

The outcome of the phases above is the production of daily, weekly and monthly and end of phase reports, which are shared with the public as provided on Table 2. In these reports, a flagging system is used to determine compliance: Green indicates Full compliance, an Orange Flag indicates compliance actions in progress and a Red Flag indicates non compliance or an orange flag that is not being closed out (Table 5).

**Table 5: Reporting Requirements and Lines**

Types of reports	Methods of data collection	Produced and Reviewed by	Submitted to
<b>Daily reports</b>	Field visits, discussions (with project personnel and site supervisor), observations, inspections, meetings with stakeholders and personnel, monitoring data collection and analysis..	<ul style="list-style-type: none"> <li>Verbal overview with site supervisor,</li> <li>Report Produced by site EMCO with inputs from CSLO, HSE</li> <li>Edited by Environmental Supervisor</li> </ul>	Internally
<b>Weekly reports</b>	Discussions with senior management and supervisors, overall analysis of results of specific investigations (if applicable) and daily reports	<ul style="list-style-type: none"> <li>Verbal overview with site supervisor</li> <li>Produced by EMCO with inputs from CSLO, HSE</li> <li>Environmental Supervisor</li> </ul>	Internally
<b>Monthly report</b>	Recapitulative weekly reports and production of a comprehensive summary report	Produced by EMCO, with key inputs from:	MINEPDED and other interested stakeholders
<b>End of project phase report</b>	Field visits, surveillance, supervision, monitoring and auditing data (if applicable)	<ul style="list-style-type: none"> <li>Environmental Supervisor</li> <li>Director of External Affairs</li> <li>International Environmental Expert</li> </ul>	

**Table 6: Sample Weekly EMC Report**

WEEKLY ENVIRONMENTAL MONITORING AND COMPLIANCE REPORT									
PROJECT PHASE: Drilling									
No	Major Activity	Sub-Activities	Potential Impact	Affected milieu	Proposed Mitigation/Enhancement Measure	Responsibility	Observation of Compliance/Non Compliance	Corrective Action	Tracking of Implementation and Responsibility
1	Storage of chemicals	Storage of barite and other hazardous chemical substances	-Risk of soil and groundwater contamination -Health risks	-Soil quality -Ground-water quality -Human	All chemicals stored onsite must be accompanied by their Material Safety Data Sheets (MSDS)	Site Manager HSE Officer	The EMCO remarked the continuous absence of MSDS for chemical substances stored at the Base	Requirement for the HSE Advisor to ensure the availability of corresponding MSDS for the chemical substances stored onsite	Action initiated on 13/02/12 Responsibility: HSE Officer/ Site Manager Action: Open

### CIRCUMSTANCES WHICH IMPEDE THE EMC PROCESS

The key factor that impedes the EMC process is the absence of a clear regulation on ESIA follow-up which provides the contents of a follow-up report. This thus gives companies the freedom to carry out and report follow-up according to their understanding, which leads to a generally low environmental performance. Also, the absence of vulgarisation of EMC Reports is one of the highest sources of disputes as there is no control of the process or the contents of the reports and thus the reports are not subject to criticisms. More so, the lack of a consensus on what follow-up should entail and on the key follow-up indicators does not challenge companies to carrying out follow-up during project implementation. In Cameroon, there is a National Association on Impact Assessment known by its French acronym ACAMEE, which has identified and made efforts to strengthen ESIA capacity, but lacks the means to sustain itself and expand its scope of work and thus is yet to be interested in ESIA follow-up issues.

### CONCLUSION AND RECOMMENDATIONS

In spite the above mentioned efforts to develop and implement an EMC methodology, difficulties are encountered in convincing project proponents on the implementation of the day to day EMC tools. They often, do not see the need to sample and monitor water and air quality even if such analysis are relevant to the realities of their projects. They often refer to the results of the ESIA and other baseline reports, thus forgetting the ability for environmental components to subdue effects during project implementation. This usually leads to conflicts and the EMCO being seen as external parties and in some cases as spies (Nguene *et al.*, 2010) or even stumbling blocks to the realisation of projects. On several occasions, during EMC requests have been made to obtain certain data from the petroleum companies, which have been difficult to come by, unless with the advent of problems with communities.

EMC during project implementation is an essential and inevitable part of Environmental Management which has yielded several benefits. Given the absence of country/project sector specific reporting requirements, the generalized EMC methodology proposed by CIME Services is an indispensable starting point for a reflection of sound Environmental Management in the Petroleum Sector of Cameroon. Therefore, monitoring and compliance methodology should be: simple, easily understood and adoptable, regularly fine-tuned to suite daily realities/challenges, tailored to meet and/or exceed environmental sustainability objectives. The EMC programme is proposed to last for the entire duration of the petroleum project (from mobilization and establishment, operations proper, decommissioning to site restoration and post site restoration). It must focus on real and emerging environmental issues and sensitivities in order to meet the needs of dynamic and global environmental challenges. In order to foster the EMC approach proposed herein, the following recommendations seem appropriate:

- Strengthening of the national regulations on ESIA follow-up;
- Creation of a roundtable for Environmental Practitioners involved in ESIA follow-up at the national and international level; and
- Creation of an independent body to oversee national ESIA follow-up in Cameroon.

### Bibliography

-Au E. and Sanvincens G. (1997) EIA Follow up and Monitoring in Report of the EIA Process Strengthening Workshop (pp. 91-107), Environmental Protection Agency, Canberra.

- CTA-AED/GLOBAL VILLAGE CAMEROON. Surveillance et suivi environnemental des aménagements hydroélectriques: Cas de l'avant-projet de barrage de Lom-Pangar au Cameroun. 18 p.
- CIME Consulting, 2013, Environmental Monitoring and Compliance Report for Kosmos Energy, Cameroon HC.
- Francois Roger NGUENE, Charlotte ENJOH FONOCCHO, Juliet TAZA ASABA & Aimee Nien NGAPOUT, 2010: Encouraging Environmental Monitoring (pp. 2-5). IAIA, 2010, Conference Paper.
- NALOUSSI, L. « Le monitoring du pipeline Tchad Cameroun ». Le magazine de l'écologie et du Développement durable; ECOVOX CIPCRE, N° 31.
- Sadler B. (1998) Ex Post Evaluation of the Effectiveness of Environmental Evaluation (pp. 30 -40). In Porter A. And Fittipaldi J (eds.) *Environmental Methods Review: Retooling Impact Assessment for the New Century*. The Press Club, Fargo, USA.
- RAINBOW ENVIRONMENT CONSULT, 2011. Le suivi environnemental des grands projets miniers au Cameroun. 12 p.
- UNEP, 2002: Environmental Impact Assessment Training Resource Manual. Second Edition 2002.