OFFICE OF THE AUDITOR-GENERAL
Enhancing Accountability

PERFORMANCE AUDIT REPORT ON LAND CONSERVATION AND RESTORATION OF QUARRIES IN KENYA

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY

SEPTEMBER 2020

VISION

Accountability and effective management of public resources

MISSION

To audit and report on the management of public resources for improved service delivery to the Kenyan people.

CORE VALUES

Integrity

Objectivity

Professionalism Competence

Innovation

Team Spirit

MOTTO

Enhancing Accountability

FOREWORD BY THE AUDITOR - GENERAL

I am pleased to present this performance audit report on Land Conservation and Restoration of Quarries in Kenya by the National Environmental Management Authority (NEMA). My Office carried out the audit under the mandate conferred on me by Section 36 of the Public Audit Act, 2015. The Act mandates the Office of the Auditor – General to examine the Economy, Efficiency and Effectiveness with which public money has been expended pursuant to Article 229 of the Constitution.

Performance, financial and compliance audits form the three-pillar audit assurance framework that I have established to give focus to the varied and wide scope of the audit work done by my Office. The framework is intended to provide a high level of assurance to stakeholders that public resources are not only correctly disbursed, recorded and accounted for, but their use results in positive impacts on the lives of all Kenyans. The main goal of our performance audits is to ensure effective use of public resources and promote service delivery to Kenyans.

The audit has an environmental management perspective on the importance of conserving and restoration of quarries in Kenya. I am hopeful that corrective action will be taken in line with recommendations in the report. This will contribute towards the realisation of the provisions of Articles 42, 69, 70 and 71 of our Constitution, which call for better management of the environment for the benefit of all Kenyans.

The report shall be tabled in Parliament in accordance with Article 229 (7) of the Constitution. I have as required in Section 36 (2) of the Public Audit Act, submitted the original copy of the report to Parliament. In addition, I have remitted copies of the report to the Cabinet Secretary, Ministry of Environment and Forestry, the Director General National Environment Management Authority, the Principal Secretary, National Treasury and the Secretary Presidential Delivery Unit.

Nancy Gathungu

AUDITOR – GENERAL

10 September, 2020

LIST OF ABBREVIATIONS

CDE	County Director of Environment
CEC	County Environment Committee
DANIDA	Danish International Development Agency
EA	Environmental Audit
EIA	Environmental Impact Assessment
EMCA	Environmental Management and Coordination Act
EMCA	Environmental Management and Coordination (Amendment) Act
EMP	Environmental Management Plan
EO	Environmental Officer
GDP	Gross Development Product
INTOSAI	International Organization of Supreme Audit Institutions
M&E	Monitoring and Evaluation
MEF	Ministry of Environment and Forestry
NEMA	National Environment Management Authority
NRM	Natural Resource Management
OAG	Office of the Auditor-General
RRMA	Riparian Resource Management Association
SEA	Strategic Environmental Assessment
TSHC	Technical Sand Harvesting Committee
WPB	Work Plan and Budget

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EXECUTIVE SUMMARY

Introduction

1. This is a performance audit report conducted by the Office of the Auditor – General on land conservation and restoration of the after life of quarries in Kenya by the National Environment Management Authority (NEMA). The audit was carried out in accordance with Section 36 of the Public Audit Act, 2015 and the International Standards of Supreme Audit Institutions (ISSAIs).

2. Quarrying is a form of land use method concerned with the extraction of rock, sand, and gravel from the ground in order to use them as materials for construction or other uses. Quarrying may be carried out in small or large scale. Land that is used for quarrying should be conserved and restored as a strategy to mitigate or minimize negative impacts on the environment.

3. With the fast rise in real estate and construction industry in Kenya, the mining and quarry sector is now the second highest growth sector having grown by 14.7% (as per the 2016 economic survey). At the base of this is the quarrying industry. However, there were concerns of lack of rehabilitation, restoration and adherance to land conservation and management measures, as outlined in the Environmental Impact Assessment (EIA) license. Extraction activities cause environmental problems within the quarries which in turn threaten the overall social and economic sustainability of the sector.

4. Uncontrolled quarrying activities has caused significant impact on the environment. The blasting of rocks with explosives in order to extract material for processing gives rise to noise pollution, air pollution, damage to biodiversity, habitat destruction and affects the human environment of a particular area.

5. Unfilled borrow pits and trenches act as water reservoirs during rainy seasons, which become death traps for human and animal population. They may also become breeding areas for mosquitoes and other harmful organisms hence posing a health risk to the surrounding community.

6. Uncontrolled and inefficient environmental management of quarrying activities has led to land degradation which in some cases, may be irreversible to restore.

Audit Objective

7. The audit objective was to assess the extent of rehabilitation and restoration of quarries after end of life.

Audit Scope

8. The audit focused on the role of NEMA during the extraction phase and the decommissioning activities at the end of the economic life of quarries. We focused on the activities in the quarries in Kakamega, Kisumu, Kilifi, Taita Taveta, Embu, Machakos, Nyeri, Isiolo, Kajiado, Nakuru and Nairobi counties. The audit covered the financial years 2012/13 to 2017/2018 in sampled counties.

Methods used in gathering audit evidence

9. The team conducted the audit in accordance with International Standards of Supreme Audit Institutions issued by the International Organisation of Supreme Audit Institutions and audit policies and procedures established by the Office of the Auditor-General. Audit evidence was gathered through documentary review, interviews and physical verification.

Summary of the Audit Findings

10. The audit established that quarries in Kenya are generally not adequately restored or rehabilitated after depletion of materials. However, borrow pits were restored/ rehabilitated accordingly. Land conservation and restoration sector is faced with various challenges as discussed below;

Lack of regulatory framework on management of quarries

11. Minerals are listed in the First Schedule of the Mining Act, 2016. However, the audit established that, construction minerals such as stones, gravel and sand are not listed in the First Schedule of the Mining Act, 2016. Further, it was established that both the state department of Mining and NEMA did not have a well-defined structure with regard to management of quarrying activities. This may have attributed to haphazard and unsafe quarry operations since it's difficult to ensure compliance and enforcement of licence conditions.

Inadequate Coordination and Consultation

12. The Audit showed that key oversight agencies have different roles and responsibilities with regard to quarrying sector management. These agencies generally operate independently without synergy.

The audit also established that County Environment Committees (CECs) no longer hold stakeholders' consultative meetings to discuss environmental issues in their respective Counties. Further, only one (1) County out of eleven (11) sampled Counties had a functional CEC in charge of environment as at the time of audit. These shortfalls have contributed to ineffective monitoring, overlaps / conflicts in management of quarries and unsustainable quarrying activities.

Failures in Rehabilitation and Restoration of Quarries

13. The audit established that quarries were not being restored or rehabilitated after depletion of quarrying materials. Quarries that existed before the commencement of Environmental Management and Coordination Act (EMCA), 1999, were abandoned without any form of rehabilitation while those that operated after the enactment of EMCA, were mainly attributed to owners opting not to decommission since they form a source of revenue from artisanal miners. In addition, tracing the land owners of the abandoned quarries for accountability and restoration before EMCA, was difficult due to land tenure problems. Currently, illegal artisanal quarrying is taking place within these quarries. Quarries abandoned without rehabilitation or restoration leads to land degradation.

Inadequacies in EIA licensing

14. The audit established that lead agencies do not submit their Environmental Impact Assessment (EIA) review comments to NEMA in order to facilitate an EIA licensing. Further, interviews and documents reviewed indicated that not all quarries that existed had obtained EIA licences. This was attributed to; low awareness on licensing, insufficient monitoring and evaluation, weak enforcement by NEMA, land ownership problems and unregulated artisanal quarrying. This has resulted to proliferation of illegal quarries that pose danger to both human and animals lives, biodiversity loss, land degradation as well as issuance of EIA licence to proponents who have not met all the required conditions for a given project.

Ineffectiveness in Monitoring and Evaluation

15. The audit established that the monthly, quarterly and annual monitoring reports were a combination of activities carried within the period. However, the reports had minimal information on quarrying activities as few quarry sites monitoring visits are carried out by NEMA. In addition, there is no monitoring of sand harvesting activities on site as Technical Sand Harvesting Committees are not yet in place. This was mainly attributed to; lack of work plans, quarry inventories, inadequate funds and staff in relation to the wide geographical coverage and NEMA's mandate as well as lack of clear laid down structures on monitoring and evaluation at the department and field levels. These inadequacies lead to limited compliance with laws, policies and guidelines on sustainable environmental management at quarries as well as on sand harvesting.

Conclusion

16. There has been no marked decommissioning, rehabilitation and restoration of quarries in Kenya. NEMA being the coordinating agency on matters environment, has not adequately ensured that quarries are properly decommissioned after end of their economic life. This has contributed to land degradation and increase of non-regulated artisanal quarries in the country. The non-decommissioned quarries are a danger to the lives of human, livestock, wildlife as well as loss of the larger biodiversity at the quarry sites.

17. There are gaps in quarry EIA licensing process since not all lead agencies submit their comments or feedback to NEMA for review process and issuance of EIA license.

18. Both the state department of Mining and NEMA did not have a well-defined structure with regard to management of quarrying activities. This creates challenges as no single authority is mandated with quarrying activities as quarrying is not defined as a mineral.

19. The absence of a monitoring framework by the Ministry of Environment and Forestry or that of Mining and Petroleum for quarries was a hinderance to the development of quarries inventory by NEMA, proliferation of illegal and unregulated artisanal quarries as well as unsustainable land maintenance.

Recommendations

20. The Auditor-General proposes the following recommendations to ensure land conservation and restorations of quarries in Kenya;

    i. The Ministry of Environment and Forestry through NEMA should prepare and issue regulations for quarrying activities that involve construction minerals such as stones, sand and gravel so as to enhance their management. In

addition, Sand Harvesting Guidelines should be made legally binding in order for them to be enforceable.

ii. NEMA should ensure that all relevant lead agencies in environmental management are actively involved in quarrying activities in their respective Counties.

iii. County Governments should fast-track the gazettement of County Environment Committees (CECs) to make them functional and effective in management of environmental issues.

iv. NEMA should ensure compliance and strict adherence to EIA licence conditions such as decommissioning plans by the proponents in order to ensure rehabilitation and restoration of quarries.

v. NEMA should consider introduction of a restoration fund where quarry proponents deposit a bond. The funds can be used to rehabilitate the quarries in case of abandonment. This will also deter the proliferation of unregulated artisanal quarries which further contributes in land degradation.

vi. NEMA should ensure up-to-date inventory of all quarries in their respective Counties for effective monitoring and management of all quarries activities.

CHAPTER 1

BACKGROUND OF AUDIT

Introduction

1.1 This report contains findings and recommendations of a Performance Audit conducted by the Office of the Auditor-General on land conservation and restoration of after life of quarries in Kenya by the National Environment Management Authority (NEMA). The Audit was carried out in accordance with Section 36 of the Public Audit Act. 2015 and the International Standards of Supreme Audit Institutions (ISSAIs).

1.2 Quarrying is a form of land use method concerned with the extraction of rock, sand, and gravel from the ground to produce materials for construction or other uses. Quarrying may be carried out in small or large scale. Land that is used for quarrying should be conserved and restored as a strategy to mitigate or minimize negative impacts on environment.

1.3 With the fast rise in real estate and construction industry in Kenya, the mining and quarry sectors is now the second highest growth sector having grown by 14.7% (as per the economic survey, 2016). At the base of this, is the quarrying industry. However, there were concerns about lack of rehabilitation, restoration, illegal, abandoned quarries and adherence to land conservation and management measures outlined in the EIA license. These cause environmental problems within the quarries which in turn threaten the overall social and economic sustainability of the sector.

1.4 Uncontrolled and inefficient environmental management of quarrying activities results to soil erosion, loss of soil fertility and productivity that enhances desertification, diminishing value of land, loss of biodiversity, degradation of channel morphology, river siltation and dust pollution. Overall, these lead to land degradation which in some cases may be irreversible to rehabilitation.

1.5 Uncontrolled quarrying activities has caused a significant negative impact on the environment. The blasting of rocks with explosives in order to extract material for processing gives rise to noise pollution, air pollution, damage to biodiversity and habitat destruction which affect the human environment of a particular area.

1.6 Unfilled borrow pits[1] and trenches act as water reservoir during rainy seasons, which become death traps for human and animal population as well as breeding areas for mosquitoes and other harmful organisms thus posing a health risk to the surrounding communities.

Motivation for the Audit

1.7 Currently, Kenya urban population stands at about 13 million people (UN, 2018) with an annual urban housing demand of about 250,000 units. This has contributed to proliferation of quarrying activities across the country most of which are uncontrolled resulting to land degradation. Due to the shortcomings, there is need to evaluate the efficiency and effectiveness of management of quarrying activities to ensure land conservation.

1.8 There have been reports in the media indicating that the quarrying sector is tremendously growing in Kenya. However, only a few of these quarries are being rehabilitated or restored, leading to land degradation. The situation has been aggravated by lack of adequate efforts in mitigation measures and monitoring by quarry operators and relevant authorities entrusted with powers of ensuring that there is rehabilitation. There was therefore a need to audit the accountability and performance of land conservation at quarries.

1.9 According to mining and quarrying activities, there was an increase in value from 14.9 billion in 2008 to Kshs. 23.6 billion in 2015, accounting for 0.7% of the GDP of 3.4 trillion. The value of real estate in the past two years has grown to Kshs. 50 Billion, with the base of this success being the quarrying industry. Amidst this are concerns on land sustainability of the quarries due to neglect and emergence of illegal quarrying. This made it necessary to carry out an audit whose recommendations are likely to provide means of increasing productivity and at the same time, reducing environmental degradation.

1.10 Communities living in riparian areas in Kenya, depend on sand harvesting as a source of income and livelihood, however there were alarming reports on over exploitation of sand without rehabilitation. This necessitated NEMA to formulate guidelines on sand harvesting and monitoring. It was, therefore, important to audit the performance of implementation of the guidelines, to ensure sustainable utilisation of the resource, so as to maintain the environmental, social and economic aspects related to sand harvesting.

1 Borrow pits: these are excavated areas from which construction materials such as sand and gravel has been dug for use as fill at another location

CHAPTER 2

DESIGN OF THE AUDIT

Audit Objective

2.1 The objective of the audit was to assess the extent of rehabilitation and restoration of quarries after end of life.

Audit Scope

2.2 The audit focused on the role of NEMA during extraction phase and the decommissioning activities on end of economic life of quarries, and covered the financial years 2012/13 to 2017/18. We focused our activities in the quarries of Kakamega, Kisumu, Kilifi, Taita Taveta, Embu, Machakos, Nyeri, Isiolo, Kajiado, Nakuru and Nairobi Counties. This was considered a fair representation of quarrying activities in the country.

Assessment Criteria

Regulatory Frameworks, Policies and Guidelines Environmental Licensing

2.3 According to (EMCA), 2015 section 58(2), it is a requirement that a proponent of a quarrying activity carries out an EIA study in accordance to the EIA Regulations before commencement of any quarrying activities and a report submitted to NEMA. Further, Section 23 of the EIA Regulations outlines that where NEMA approves an EIA study it shall issue an EIA license with such terms and conditions as deemed necessary.

Rehabilitation and Restoration of Quarries

2.4 Section 3.10.1 (b) of the Integrated National Land Use Guidelines, 2011 and Section 4.1 of The Sand Harvesting Guidelines and Monitoring, 2014 provides conditions under which quarrying activities should be carried out in order to ensure Rehabilitation and Restoration of land.

Coordination and Consultation by Key Stakeholders

2.5 Section 9(2a) of the Environmental Management and Coordination Act (EMCA), 1999 mandates NEMA to co-ordinate the various environmental management activities being undertaken by the lead agencies. Section 4 to 5 of the Sand Harvesting Guidelines and Monitoring, 2014 provides for the establishment of committees and associations, their composition, roles and responsibilities in order to ensure coordination and sustainable sand harvesting. According to EMCA, 2015, Section 29(1) and 30, County Governors are required to constitute and Gazette County Environment Committees (CECs), which shall be responsible for proper management of the environment within the counties.

Monitoring and Evaluation of Quarrying Activities

2.6 According to Section 69(1b) of EMCA, 1999 states that NEMA shall, in consultation with the relevant lead agencies monitor the operations of quarrying activities. Section 2.4.4 and Figure 1 of the NEMA Monitoring and Evaluation (M&E) Framework (2014-2018), outlines the frequency of Monitoring, Evaluation and Reporting at the field and departmental level within NEMA. In addition, Section 14 of the Sand Harvesting Guidelines and monitoring, 2014 states that The Technical Sand Harvesting Committee (TSHCs) will monitor the rehabilitation of all designated sand harvesting sites and their adjacent environment to ensure environmental sustainability.

Management of Funding for Quarrying Activities

2.7 Section 20(3) of EMCA, 1999 stipulates that Parliament shall provide monies to NEMA towards the expenditure incurred in performing its functions. Further, section 22(1) requires that at least three months before the commencement of each financial year, NEMA should cause to be prepared estimates of the revenue and expenditure of NEMA for that year.

Methods used in gathering audit evidence

2.8 The team conducted the audit in accordance with International Standards of Supreme Audit Institutions (ISSAIs) issued by the International Organisation of Supreme Audit Institutions (INTOSAI) and audit policies and procedures established by the Office of the Auditor-General.

2.9 The team interviewed NEMA officials and quarry operators; documents review as well as physical verification on sampled quarry sites as outlined in **Appendix 1.**

CHAPTER 3

DESCRIPTION OF THE AUDIT AREA

Ministry of Environment and Forestry

3.1 The Ministry of Environment and Forestry was created vide Executive Order No. 1 of 2018 on the organization of government of Kenya. The mandate of the Ministry is to undertake National Environment Policy and Management, Development of Forestry Policy and Management, Development of re-afforestation and agro-forestry, Restoration of strategic water towers, Protection and conservation of natural environment, Pollution control, Lake Victoria management programme, Restoration of Lake Naivasha basin, Kenya Meteorological department, Kenya Meteorological training, conservation and protection of wetlands and climate change affairs. One of the core values of the Ministry is sustainable development.

National Environment Management Authority

3.2 The National Environment Management Authority (NEMA) is a semi-autonomous Government Agency (MDA) under the Ministry of Environment and Forestry. The role of the National Environment Management Authority (NEMA) is to exercise general supervision and co-ordination over all matters relating to the environment and to be the principal instrument of Government in the implementation of all policies relating to the environment.

3.3 The Authority is principally mandated to co-ordinate the various environmental management activities being undertaken by the lead agencies and promote the integration of environmental considerations into development policies, plans, programmes and projects with a view to ensuring the proper management and rational utilization of environmental resources on a sustainable yield basis for the improvement of the quality of human life in Kenya.

3.4 To ensure environmental protection and conservation, it is a legal requirement under Environmental Management and Co-ordination (Amendment) Act (EMCA) 2015, NEMA requires the proponent of a quarrying activity to submit an Environmental Impact Assessment (EIA) study report to the Authority in the prescribed form stipulated in the Environmental Impact Assessment Regulations, 2009 before any quarrying activity; financing, commencing, proceeding with, carrying out, executing or conducting or causing to be financed, commenced, proceeded with, carried out, executed or conducted.

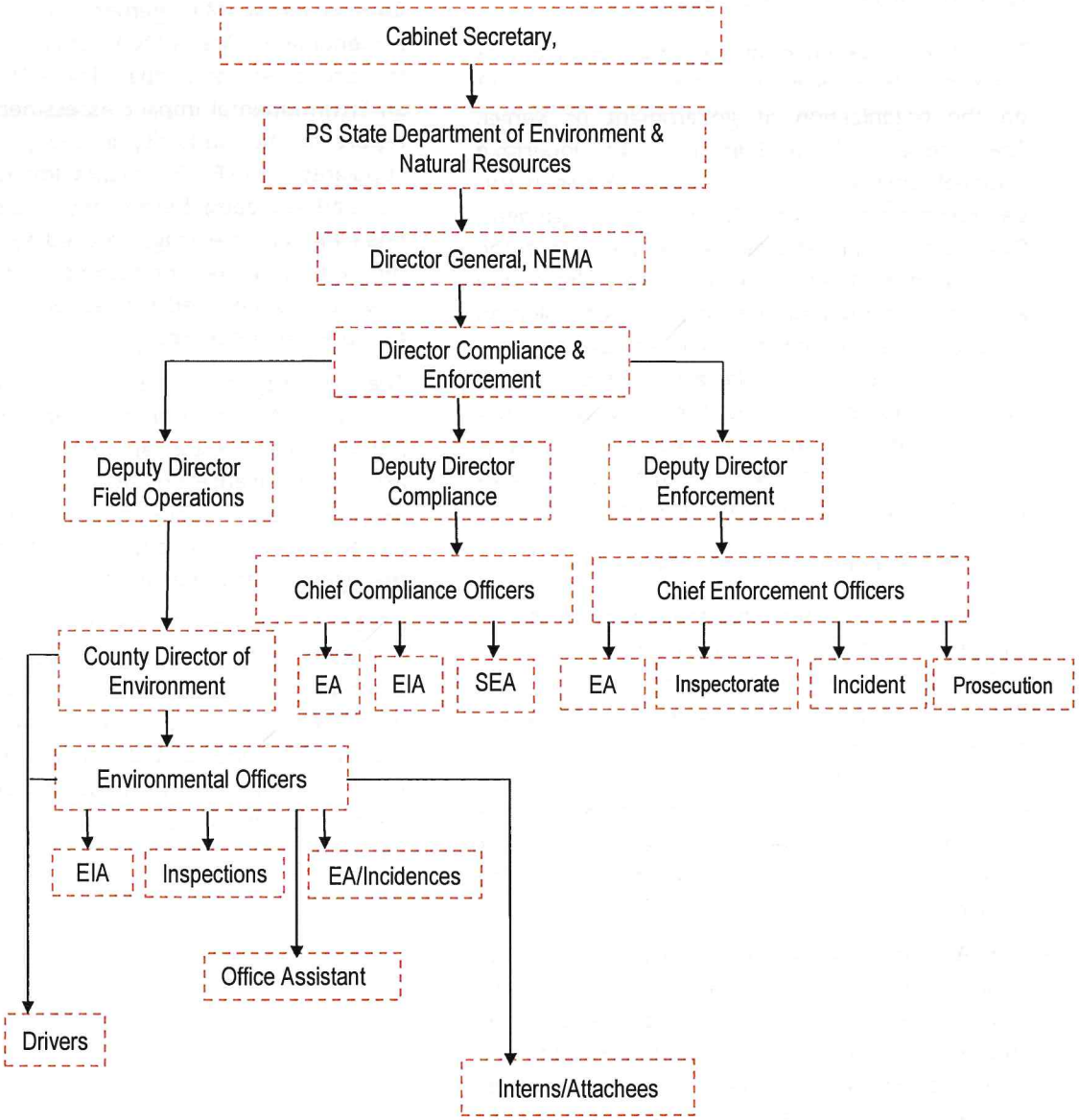
3.5 The Authority may, after being satisfied as to the adequacy of an environmental impact assessment study report, issue an environmental impact assessment licence on such terms and conditions as may be appropriate and necessary to facilitate sustainable development and sound environmental management at the quarries.

3.6 NEMA is responsible for monitoring quarrying activities and reviewing annual environmental assessment of quarrying activities with a view of determining conformance to environmental impact assessment reports and license conditions and further giving recommendations on sustainable environmental management of quarries.

Organizational Structure of NEMA

3.7 The organisational structure of NEMA is as shown in **Figure 1.**

Figure 1: Organizational Structure for NEMA on Management of Quarrying activities



Source: *NEMA, 2017*

The County Governments

3.8 The County Governments are important stakeholders in the licensing and monitoring of operations as per the Fourth Schedule of the Constitution. The Counties are mandated to raise revenue amongst other licensing fee, establish policies as well as implementation of specific national government policies on natural resources and environmental conservation.

3.9 The Riparian Resource Management Associations (RRMAs) are associations established by County Executive Committees (CEC). They are tasked with ensuring: appropriate rehabilitation of sand harvesting sites in compliance with EMCA, 1999; and also conducting consultations and collaborations amongst the key stakeholders at the sand harvesting sites within their areas of operation. The Technical Sand Harvesting Committees (TSHCs) responsibility is to monitor and supervise the RRMAs so as to ensure sustainable management of sand harvesting.

Process Description for Environmental Management of Quarrying Activities

a. Environmental Impact Assessment

3.10 Environmental Impact Assessment (EIA) is a systematic examination conducted to determine whether or not a programme, activity or project will have any adverse impacts on the environment.

3.11 The proponent of a quarrying activity is required to carry out an EIA by a registered NEMA EIA expert and submit the study report to NEMA before commencement of any quarrying activity. The EIA study report should contain an Environmental Management Plan (EMP) and a decommissioning / rehabilitation plan. These plans primarily contain the; activities, responsibilities, cost and duration of the mitigation measures of the anticipated adverse environmental impacts of the quarrying activity, during the implementation of and decommissioning phases of the project. After considering and approving the EIA report submitted, NEMA issues an EIA licence with terms and conditions as deemed necessary to be adhered to by the proponent for sustainable Implementation of the project.

b. Inspection of EMP and EIA License Conditions

3.12 Environmental Management Plan (EMP) means all details of project activities, impacts, mitigation measures, time schedule, costs, responsibilities and commitments proposed to minimize environmental impacts of activities, including monitoring and environmental audits during implementation and decommissioning phases of a project.

3.13 During the operational phase of the quarry, NEMA officers undertake routine inspections on the implementation of the approved EMP. The officers prepare an inspection sheet which is filed and a copy given to the proponent. After inspection NEMA may further issue the proponent with an improvement notice (warning/notification) or restoration order (a directive) depending on the extent of compliance with the EMP and license conditions. If a proponent does not comply with the restoration order, then he/she may be subjected to prosecution.

3.14 In cases where an incident on a quarrying activity is reported to NEMA or the occurrence comes to NEMA's knowledge; NEMA undertakes an inspection of the site and compiles an incidence report.

c. Environmental Audit

3.15 Environmental Audit means a systematic evaluation of activities and processes of an ongoing project to determine how far these activities and programmes conform with the approved environmental management plan of that specific project and sound environmental management practices.

3.16 Proponents are required to carry out an Environmental Audit (EA) of the quarrying activities by a registered EIA&EA expert; after the first year of commencement of quarrying activity, and also on an annual basis. For the case of quarrying activities which existed before the commencement of the Environmental Management and Co-ordination Act (EMCA), 1999 they should carry out an initial EA which should then be submitted to NEMA for review. During the review NEMA officers may carry out field visits to the quarry if deemed necessary. After review of the report NEMA may issue recommendations for improvement of the environmental conditions at the quarry to the proponents.

d. Decommissioning of Quarries

3.17 It is a requirement under the Environmental Impact Assessment that quarries shall be restored within twelve (12) months of depletion of the quarry. Prior to the decommissioning or completion of a quarrying activity, the proponent should notify, prepare and submit to NEMA a decommissioning plan; which principally contains the timeliness and actions to be taken to restore the quarry to its almost original state.

3.18 After review of the decommissioning plan, NEMA may approve it with or without conditions as deemed necessary. During and after restoration, NEMA carries out site visits to the quarry site for verification purposes. When fully satisfied with the restored quarry, NEMA, through the County Environment Committee or any other appointed agent, issues a clearance letter to the proponent.

e. Coordination and Consultation

3.19 NEMA should coordinate and ensure consultations amongst the key lead agencies with roles and responsibilities on environmental management of quarrying activities; these lead agencies include County Governments, Ministry of Mining, Ministry of Lands and Security.

3.20 The TSHCs report to respective County Executive Committees (CECs) formerly District Environment

Committees (DEC) who in consultation with the Director General, NEMA prescribes the terms of reference and rules of procedure for the TSHCs. The CECs are constituted and gazetted by the County Governors. They are responsible for the proper management, coordination and supervision of the environment (all quarrying activities) within the county for which they are appointed.

f. Monitoring and Evaluation

3.21 NEMA is expected to monitor the operations of quarrying activities through two levels, the field and departmental level. The field level monitoring is carried out by the Environmental Officers (EOs) who are gazetted Environmental Inspectors. This monitoring of quarrying activities is undertaken either on a weekly, bi-monthly or monthly basis depending on the work schedule at the county. Monitoring of the quarrying activities is also carried out as need arises and on annual basis. The County Directors of Environment (CDEs) get weekly briefs from EOs on all activities carried out within the week; they review and submit to the Director General, NEMA via email for monitoring purposes. Additionally, EOs update the CDEs regarding quarrying activities on a need basis. However, CDEs carry out onsite (field) monitoring of quarrying activities on a quarterly basis.

3.22 The Deputy Director Field Operations (DD.FO); Deputy Director Enforcement (DD. E); Chief Enforcement Officer (C/EO); Director Compliance and Enforcement (Dir. C&E) are also required to carry out monitoring but the frequency is not clearly laid down. Field monitoring reports as well as monthly and quarterly Monitoring reports on quarrying activities should be produced.

3.23 At the departmental level monitoring; all departmental targets and outcomes are to be analysed and consolidated in order to measure overall departmental effectiveness and efficiency. The analysis of monitoring and evaluation at each level builds on the results of the previous one.

3.24 Technical Sand Harvesting Committees (TSHCs) monitors the rehabilitation of all designated sand harvesting sites and their adjacent environment (access roads, riverbanks, catchment areas among others). Further, TSHCs monitor the County and RRMAs to ensure environmental sustainability.

Funding for Management of Quarrying Activities by NEMA

3.25 NEMA is a statutory body which receives funding from the exchequer and internally generated revenue in form of fees and levies. The audit established that NEMA receives a one-line budget from the Government with no breakdown of the activities to be funded. Subsequently, NEMA headquarters generate for each county office, work plans and budget (WPB) based on the funds received. The WPB are categorized into four activities i.e. Environmental Impact Assessment, Environmental Audit, Inspection and Office operations. The budget is generally for all environmental management functions of NEMA such as waste management and water quality.

3.26 The budget and actual expenditures for the activities of: Environmental Impact Assessment (EIA); Environmental Audit (EA); Office operations; and Inspection for entire NEMA county offices for the financial years 2012/2013 to 2017/2018 is shown in **Table 1**: -

Table 1: NEMA's County Offices Budget and Actual Expenditure in Kshs Millions

F/Y	2012/2013		2013/2014		2014/2015		2015/2016		2016/2017		2017/2018	
Source	Budget	Actual	Budget	Actual	Budget	Actual	Budget	Actual	Budget	Actual	Budget	Actual
GOK	9.30	8.40	4.60	4.56	4.43	4.50	5.39	5.30	4.00	4.02	6.11	6.02
NRM	-	-	3.42	3.40	3.02	2.90	2.85	2.86	4.00	3.80	5.81	3.80
TOTAL	9.30	8.40	8.02	7.96	7.45	7.40	8.24	8.16	8.00	7.82	11.92	7.82

Source: *NEMA-Finance Department, 2017*

3.27 During the Financial Years (F/Y) 2013/2014 to 2017/2018, NEMA received donor funds from DANIDA under the Natural Resource Management (NRM) Programme to support some activities as shown in **Table 1**.

CHAPTER 4

FINDINGS OF THE AUDIT

4.1 The audit established that there were minimal decommissioning activities to rehabilitate and restore the quarries after depletion of materials. However, we observed that borrow pits were accordingly restored or rehabilitated. The Land Conservation and Restoration sector is faced with various challenges as discussed below;

Lack of regulatory framework on management of quarries

4.2 The Mining Act, 2016 interprets construction minerals among others as stones, gravel, sand and any other minerals used for construction of buildings, roads and dams. Section 179 of the Act requires the holder of the permit or licence to ensure sustainable use of land through restoration of abandoned mines and quarries.

4.3 Documentary review revealed that, these minerals (stones, gravel and sand) are not listed as construction minerals in the First Schedule of the Mining Act, 2016. Further, interviews with NEMA officers indicated that both the State Department of Mining and NEMA did not have a well-defined structure with regard to management of quarrying activities. This may have contributed to haphazard and unsafe quarry operations since it's difficult to ensure compliance and enforcement of licence conditions.

Inadequate Coordination and Consultation

4.4 Section 9(2a) of the Environmental Management and Co-ordination Act, 1999 mandates NEMA to co-ordinate the various environmental management activities being undertaken by the lead agencies and promote the integration of environmental considerations into development policies, plans, programmes and projects. This was to ensure proper management and rational utilisation of environmental resources on a sustainable yield basis for the improvement of the quality of human life in Kenya. In addition, it is a requirement under Section 29(1) and 30 of (EMCA), 2015, that County Governors constitute and Gazette County Environment Committees (CECs), who shall be responsible for the proper management of the environment within the counties.

4.5 Interviews and documentary review showed that key oversight agencies play different roles and responsibilities with regard to quarrying sector management: The Ministry of Land is involved with land ownership; NEMA with environmental management coordination; County governments with business licences and permits; quarry investors with the daily operations of quarries; and the State Department of Mining is involved in the licensing of the use of explosives in quarries.

4.6 The audit, however, established that these agencies generally operate independently without synergy. The CECs no longer hold stakeholders' consultative meetings to discuss environmental issues in their respective Counties, and as at the time of audit, only Embu County had a functional CEC in charge of environment out of the sampled Counties. NEMA acts as a secretariat to the committee in these meetings. However, during the exit meeting, NEMA officials revealed that 39 of the 47 CECs had been gazetted. We could however, not confirm whether they were operationalised.

4.7 Inadequate coordination, collaboration and consultation have led to ineffective monitoring, overlaps, conflicts in management of quarries and unsustainable quarrying activities.

Failures in Rehabilitation and Restoration of Quarries

4.8 According to the standard decommissioning conditions as outlined in EIA license, the proponent shall ensure that a decommissioning plan is submitted to NEMA for approval at least three (3) months prior to decommissioning.

4.9 Section 3.10.1 (b) of the Integrated National Land Use Guidelines states that quarries shall be restored within twelve (12) months of depletion of the quarry and the District Environment Committee or an appointed agent shall issue a clearance letter confirming satisfaction with the restoration efforts.

4.10 The audit established that quarries were not being restored or rehabilitated after depletion of quarrying materials. Quarries that existed before the commencement of EMCA, 1999 were abandoned without any form of rehabilitation while those after enactment of EMCA were mainly due to owners opting not to decommission since they form a source of revenue from artisanal miners. In addition, tracing the land owners to abandoned quarries before EMCA so as to be held accountable for land restoration is difficult due to land tenure problems. Currently, illegal artisanal quarrying is taking place within these quarries which could further aggravate land degradation.

4.11 In all the sampled counties only six (6) quarries had been decommissioned but none had a clearance letter. The reasons given for lack of restoration of quarries were: lack of decommissioning plans; land ownership problems especially where the land is owned communally; high cost of rehabilitation; conflicts between quarry owners and proponents; market forces, leading to temporary closure when demands for quarry materials are low and reopening when demands are high; and lack of awareness on the rehabilitation requirements.

4.12 Quarries left without rehabilitation or restoration leads to land degradation, poses health hazards, endanger the lives of human beings, livestock and wildlife, as well as loss of the larger biodiversity at the quarry sites.

Inadequacies in EIA licensing

4.13 The Environmental Management and Co-ordination Act, 1999 Section 58(2) requires the proponent of a project to undertake an environmental impact assessment study, prepare a report and submit it to NEMA for assessment. The Environmental (Impact Assessment and Audit) Regulations, 2003 Section 9 states that, the lead agencies shall within twenty-one (21) days of receipt of a project report from the Authority, submit their comments after which the Authority shall proceed to determine the project report. Where the Authority approves an EIA study report under regulation 23, it shall issue an EIA licence with such terms and conditions as deemed necessary by the Authority. Further, Section 45(2d) requires persons issued with the licence to adhere to EIA licensing conditions or be deemed as have committed a criminal offence.

4.14 The audit established that lead agencies do not submit their EIA reports review comments within the stipulated timeline or there was complete lack of submission after which the Authority proceeded with the review process and issuance of EIA licence without any further reference. This therefore, creates gaps in EIA licensing process. Interviews with County Directors of Environment and site visits revealed that not all quarries visited had EIA licences and out of the sampled 11 counties only three (3) had the list of all quarries in place as at the time of the audit as shown in the **Table 2.**

Table 2: A list of quarries with and without EIA licenses per County

County	List of all Quarries	No. with EIA license	No. without EAI license
Kakamega	None	9	4
Kisumu	None	Unknown	Unknown
Nyeri	Available	17	17
Embu	Available	12	9
Machakos	Available	57	14
Kilifi	None	11	11
Voi	None	Unknown	Unknown
Isiolo	None	2	
Nakuru	None	Unknown	Unknown
Kajiado	None	Unknown	Unknown
Nairobi	None	Unknown	Unknown
Total		**106**	**55**

Source: *OAG Analysis*

4.15 Inadequacies in EIA licencing attributed to; low awareness on licensing, insufficient monitoring and evaluation, weak enforcement by NEMA partially due to insecurity at the quarries, land ownership problems and unregulated artisanal quarrying. This may result into proliferation of illegal quarries that pose a danger to both human and animal lives, biodiversity loss, land degradation as well as issuance of EIA licence to proponents who have not met all the required conditions as per a given project.

Ineffectiveness in Monitoring and Evaluation

4.16 Section 2.4.4 and Figure 1 of the NEMA Monitoring and Evaluation (M&E) Framework (2014-2018), requires that M&E should be undertaken and reports produced monthly, quarterly and annually at the departmental level. Field monitoring reports should also be prepared and documented after field visits by relevant Staff.

4.17 According to Section 69 (1b) of EMCA, 1999, the Authority shall, in consultation with the relevant lead agencies, monitor: - the operation of any industry, project or activity with a view of determining its immediate and long-term effects on the environment.

4.18 Section 14 of the Sand Harvesting Guidelines and Monitoring states that the Technical Sand Harvesting Committees (TSHCs) will monitor the rehabilitation of all designated sand harvesting sites and their adjacent environment (access roads, riverbanks, catchment areas among others) to ensure environmental sustainability.

4.19 The audit established that the monthly, quarterly and annual monitoring reports were a combination of activities carried within the period. However, the reports had negligible information on quarrying activities as few quarry sites monitoring visits are carried out by NEMA. In addition, there is no monitoring of sand harvesting activities on site as TSHCs are not yet in place.

4.20 Ineffectiveness in M&E is mainly due to; lack of inspection plans, quarry inventories, inadequate funds and staff in relation to the wide geographical coverage and NEMA's mandate as well as lack of clear laid down structures on monitoring and evaluation at the department and field levels. These are likely to lead to limited compliance with laws, policies and guidelines on sustainable environmental management at quarries as well as on sand harvesting.

CHAPTER 5

CONCLUSION

5.1 There has been no marked decommissioning, rehabilitation and restoration of quarries in Kenya. NEMA being the coordinating agency on matters environment has not adequately put in measures to ensure quarries are properly decommissioned after end of economic life. This has contributed to land degradation and an increase in non-regulated artisanal quarries in the country. The non-decommissioned quarries are a danger to the lives of human, livestock, wildlife as well as loss of the larger biodiversity at the quarry sites.

5.2 There are gaps in quarry EIA licensing process since not all lead agencies submit their comments/ feedback to NEMA for review process and issuance of EIA license.

5.3 Both the State Department of Mining and NEMA did not have a well-defined structure with regard to management of quarrying activities. This creates challenges as no single authority is mandated with quarrying activities as quarrying is not defined as a mineral.

5.4 The absence of a monitoring framework by the Ministry of Environment and Forestry or that of Mining and Petroleum for quarries was a hinderance to NEMA developing quarries inventory, proliferation of illegal and unregulated artisanal quarries as well as unsustainable land maintenance.

CHAPTER 6

RECOMMENDATIONS

6.1 The Auditor-General has proposed the following recommendations to ensure land conservation and restoration of quarries in Kenya;

i. The Ministry of Environment and Forestry should prepare and issue enabling regulations for quarrying activities that involve construction minerals such as stones, sand and gravel to enhance management and monitoring. In addition, Sand Harvesting Guidelines should be made legally binding in order for them to be enforceable.

ii. NEMA should ensure that all relevant lead agencies in environmental management are actively involved in quarrying activities in their respective Counties through submission of comments in EIA.

iii. County Governments should fast-track the gazettment of CECs to coordinate effective environmental issues.

iv. NEMA should ensure compliance and strict adherence to EIA licence conditions such as decommissioning plans by the proponents in order to ensure rehabilitation and restoration of quarries.

v. NEMA should consider introduction of a Restoration Fund where quarry proponents deposit some money as a bond which can be used to rehabilitate a quarry in case of abandonment. This may also deter the proliferation of unregulated artisanal quarries which further attributes to land degradation.

vi. NEMA should ensure up-to-date inventory of all quarries in the country for effective monitoring and management of all quarries' activities.

vii. NEMA should ensure equitable staff distribution across the Counties so that they can effectively discharge their duties accordingly.

7.0 APPENDICES

Appendix I: Methods and Purpose of Data Collection

Method of Collecting Information	Purpose
a. Interviews	
Interview Directors and Senior Managers of NEMA	To obtain information of the institutional arrangements/ direction on regulatory frameworks, policies, funds management, monitoring and evaluation on environmental management of quarrying activities. To also understand the administration of office operations in order to ensure efficiency in the performance of functions related to environmental management of quarrying activities
Interview technical staff at NEMA	To understand how they ensure adherence to environmental standards at the quarries.
Interview lead agencies with key roles in management of quarries	To obtain information on their roles and how they carry out Coordination and consultation amongst the key lead agencies with regard to management of quarrying activities.
Interview the quarry operators	To understand the how they carry out mitigation measures to ensure rehabilitation and restoration of quarries.
b. Observations	
Carry out physical verification on sampled quarry sites and NEMA offices	To verify the status of rehabilitation and restoration of quarries; and also how staff members of NEMA and quarry operators carry out their activities.
c. Documents Review	
Acts, Regulatory frameworks, policies and guidelines related to rehabilitation and restoration of quarries	To understand the legislative and policy frameworks, directives and decisions governing rehabilitation and restoration of quarries.
NEMAs Strategic Plan	To obtain information on NEMAs strategic focus and how they plan to deliver their mandate with regard to rehabilitation and restoration of quarries.
Environmental licences; Environmental management plans; and Approved decommissioning plans of quarries	To understand environmental licensing terms, conditions and the mitigation measures of impacts associated with rehabilitation and restoration of quarries.
NEMAs work plans on quarrying activities	To analyze the planned quarrying activities in relation to the resources (time, personnel and funds) available and required.
Monitoring and Evaluation reports	To understand the actual performance against what was planned/executed, and lessons learnt from failures/ successes.

Minutes and other reports on management of quarrying activities	To obtain information regarding consultation amongst stakeholders and also the status of management of quarries.
Review the financial reports of NEMA and the Ministry of Environment, Natural Resources and Regional Development Authorities	To confirm the sources of funding and if there is prudence in management of funds to ensure sustainable management of the quarrying sector.

Appendix II: National Environment Management Authority`s Response to Audit Findings

Finding	NEMA Response	OAG Comment
Inadequate Coordination and Consultation (Para 4.3-4.6) Interviews and documentary review revealed that key oversight agencies play different roles and responsibilities with regard to quarrying sector management: The Ministry of Lands is involved with land ownership; NEMA with environmental management coordination; County governments with business licences and permits; quarry investors with the daily operations of quarries; and the State Department of Mining is involved in the licensing of the use of explosives in quarries only. However, the audit established that these agencies generally operate independently without synergy. CECs no longer holds stakeholders' consultative meetings to discuss environmental issues in their respective Counties as by the time of audit, only Embu County had a functional CEC in charge of environment out of the sampled Counties. NEMA acts as a secretariat to the committee in these meetings. However, during the exit meeting, NEMA officials revealed that more Counties had established CEC.	The EIA process provides for intuitional recognition during which the EIA reports are dispatched to relevant Lead Agencies for comments, sectoral inputs and technical support. Furthermore, inter -agency inspection teams are a strategic administrative procedure for higher risks projects, activities and is undertakings and currently being practiced country-wide Gazettement of County Environmental Committees (CECs) has improved to 39 out of 47 Counties.	Though the EIA reports are dispatched to relevant stakeholders, there were instances of delays or non-response from the stakeholders especially for low risk projects. NEMA should device a method of ensuring receipt of comments within the stipulated period. Further, we commend NEMA for operationalising the County Environmental Committees (CECs).

Failure in Rehabilitation and Restoration of Quarries (Para 4.7-4.11) The audit established that quarries were not being restored/ rehabilitated after depletion of quarrying materials. Quarries that existed before the commencement of EMCA, 1999 were abandoned without any form of rehabilitation while those after enactment of EMCA were mainly due to owners opting not to decommission since they form a source of revenue from artisanal miners. In addition, tracing the land owners to abandoned quarries before EMCA so as to be held accountable for land restoration is difficult due to land tenure problems. Currently, illegal artisanal quarrying is taking place within these quarries which could further aggravate land degradation. In all the sampled counties only six (6) quarries had been decommissioned but none had a clearance letter. The reasons given for lack of restoration of quarries were: lack of decommissioning plans; land ownership problems especially where the land is owned communally; high cost of rehabilitation; conflicts between quarry owners and proponents; market forces leading to temporary closure when demand for quarry materials is low and the reopening when demand is high; and lack of awareness on the rehabilitation requirements. Quarries left without rehabilitation/ restoration leads to land degradation, poses health hazards, endanger the lives of human beings, livestock, wildlife as well as loss of the larger biodiversity at the quarry sites.	The Ministry of Environment and Forestry through NEMA established a Taskforce on Management of Quarrying Activities in Kenya. The report presented their report. Further, NEMA has initiated a compliance assistance programme to artisanal mining and quarrying operators. The programme has been undertaken in Western and Coastal Regions, with plans to cascade to other regions. The Authority has also issued best practice guidelines on rehabilitation of abandoned quarries using semi waste from existing open dumps though they have not been operationalised.	Though we commend the Authority for the steps towards rehabilitation and restoration, the success or otherwise of the measures can only be ascertained on implementation.

In-adequacies in EIA licencing (Para 4.12-4.13) The audit further established that lead agencies do not submit their EIA reports review comments within the stipulated timeline or complete lack of submission after which the Authority proceed with the review process and issuance of EIA licence without any further reference. This therefore, creates gaps in EIA licensing process. Interviews with County Directors of Environment and site visits revealed that not all quarries visited had EIA licences and out of the sampled 11 counties only three (3) had the list of all quarries in place as at by the time of the audit.	The Authority agreed that timely submission of comments from relevant lead agencies is a limiting factor in the EIA process. The Authority has initiated the process of establishing of Environmental Desk in relevant MDAs and further, hold periodic meetings and trainings with the stakeholders.	We commend the Authority for putting up measures to address the inadequacies. The success of the measures will be determined at a follow up audit.
Ineffectiveness in Monitoring and Evaluation(Para4.14-4.18) The audit established that the monthly, quarterly and annual monitoring reports were a combination of activities carried within the period. However, the reports had negligible information on quarrying activities as few quarry sites monitoring visits are carried out by NEMA. In addition, there is no monitoring of sand harvesting activities on site as TSHCs are not yet in place. Ineffectiveness in M&E is mainly due to; lack of inspection plans, quarry inventories, inadequate funds and staff in relation to the wide geographical coverage and NEMA's mandate as well as lack of clear laid down structures on monitoring and evaluation at the department and field levels. These are likely to lead to limited compliance with laws, policies and guidelines on sustainable environmental management at quarries as well as on sand harvesting.	The need to customize the sand harvesting guidelines into regulation for enforceability has been initiated. Further, the draft Environmental Management and Coordination (Deposit Bonds) Regulations 2018 has been formulated and forwarded to the Ministry for Gazettement. The regulations will provide for Environmental Financial Assurance (EFA) whose activities have significant adverse effects on the Environment shall pay a deposit bond. Quarrying constitute this activity.	Our finding on the status of the Authority monitoring of quarrying activities remain as reported. However, we commend the Authority for the draft measures proposed that will go a long way in monitoring operations in the quarrying activities.

CONTACTS

Office of the Auditor-General

Address: P.O. Box 30084-00100, NAIROBI.
Telephone: +254 796 52 85 60
E-mail: info@oagkenya.go.ke

Website: www.oagkenya.go.ke

@OAG_Kenya

Office of the Auditor-General Kenya