OFFICE OF THE AUDITOR-GENERAL

Enhancing Accountability

PERFORMANCE AUDIT REPORT OF THE AUDITOR-GENERAL

ON

CONSERVATION OF WATER TOWERS IN KENYA

BY

THE KENYA WATER TOWERS AGENCY

Foreword by the Auditor – General

I am pleased to present this performance audit report on Conservation of Water Towers in Kenya by the Kenya Water Towers Agency. 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 of Kenya, 2010.

Performance, financial and compliance audits form the three-pillars of the 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 and livelihoods of the citizens. The main goal of our performance audits is to ensure effective use of public resources and promote service delivery to citizens.

Our performance audits examine compliance with policies, obligations, laws, regulations and standards, and whether the resources are managed in a sustainable manner. They also examine the economy, efficiency and effectiveness with which public resources have been expended. I am hopeful that corrective action will be taken in line with our recommendations in the report.

The report is submitted to Parliament in accordance with Article 229 (7) of the Constitution of Kenya, 2010 and Section 39 (1) of the Public Audit Act, 2015. I have also submitted copies of the report to: the Principal Secretary, State Department for Environment and Climate Change; the Principal Secretary, the National Treasury; the Director General, Kenya Water Towers Agency, and the Chief of Staff and Head of Public Service.

CPA Nancy Gathungu, CBS

AUDITOR – GENERAL

September, 2023

Executive Summary

Background of the Audit

1. The Kenya Water Towers Agency (KWTA) Order, 2012 defines a water tower as an area that acts as a receptacle for rain water, stores water in the aquifers underneath and gradually releases the water to the rivers and springs emanating from it. Such areas are forested mountainous regions, highlands and plateaus. There are eighteen (18) gazetted water towers in Kenya. The gazetted water towers consist of five (5) major ones, namely: Mt. Kenya, Aberdare Ranges, Mau Forest Complex, Cherangani Hills and Mt. Elgon, and thirteen (13) minor, but critical water towers.

2. Conservation of the water tower ecosystem, including species and the environmental benefits deriving from it, is mainly achieved through protection and rehabilitation or restoration of water towers. The Government's commitment to conservation of water towers dates back to 2008 when protection and rehabilitation of water towers was first identified as a Vision 2030 flagship project. This was later followed by the establishment of the Kenya Water Towers Agency (KWTA) in 2012, to coordinate and oversee the conservation and sustainable management of water towers. Despite the Government's conservation efforts, water towers are faced with challenges which limit their capacity to provide ecosystem services.

3. The audit was undertaken due to the following key factors: -
    i) There has been increased public concern on destruction of Kenya's main water towers. News on illegal logging and forest encroachment continue to be reported in the Mau Forest Complex and Cherangani Hills while forest fires in the Aberdare Ranges and Mt. Kenya have also made news headlines in the recent past. Further, drying of major rivers such as Mara River, Ewaso Nyiro and River Turkwel has been attributed to climate change and catchment destruction. This is despite Articles 60 (1)(e) and 69 (1)(a) of the Constitution of Kenya, 2010 explicitly providing for sound conservation and protection of ecologically sensitive areas and sustainable exploitation, utilization,

management, and conservation of the environment and natural resources.

ii) There has been a deliberate effort by the Government to expand safe water[1] coverage in the Country. Through the implementation of various projects, the Government increased safe water coverage from 49% in 2010/2011 to 60% in 2020/2021. This is in line with the Kenya Water Master Plan 2030, whose goal is to achieve 100% improved water coverage in the country by 2030. The Government's efforts are also aimed at contributing to the achievement of Sustainable Development Goal (SDG) 6 target 1, which calls on member states to achieve universal and equitable access to safe and affordable drinking water for all by 2030. Long-term sustainable expanded water coverage depends to a greater extent on conservation of water towers.

4. It was therefore necessary to conduct an audit to assess the Government's progress in conservation of water towers. The audit subject is related to SDG 6 Target 6 which sought to protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes by 2020.

Objective of the Audit

5. The audit assessed the implementation of the measures put in place by the Government, through the Kenya Water Towers Agency (KWTA), to conserve water towers for sustainable water supply. This was examined through the following audit questions: -

    i) To what extent has the Agency implemented the measures in place to protect water towers?

    ii) To what extent has the Agency implemented interventions to rehabilitate degraded water towers?

[1] Safe water means *potable water, free from pollution, harmful organisms, and impurities. The term safe water is often used interchangeably with tapped water.*

iii) To what extent has the Agency provided forest adjacent communities with alternative livelihoods in order to ease pressure from water towers?

iv) To what extent has the Agency involved stakeholders in conservation activities?

v) To what extent has the Agency monitored and assessed conservation activities in water towers?

Scope of the Audit

6. The audit focused the Agency's activities geared towards conservation of water towers. The activities examined included water tower protection, rehabilitation, community alternative livelihoods, stakeholder engagement, and monitoring of conservation activities. The audit covered the period from July 2017 to December 2022 and focused on the eighteen (18) gazetted water towers. However, nine (9) water towers, consisting of three (3) major and six (6) minor, were sampled for purposes of audit data collection. For purposes of examining interventions on reclamation of encroached water towers, the Mau Forest Complex was selected as a case study.

7. The sampled main water towers are Aberdare Ranges, Cherangani Hills, and the Mau Forest Complex while the minor ones are Chyulu Hills, Kirisia Hills, Loita Hills, Nyambene Hills, Mt. Marsabit, and Shimba Hills.

Summary of Major Audit Findings

1. Protection of Water Towers

8. Protection of water towers as carried out by the Agency was mainly done through water towers boundary mapping and delineation, mapping and securing of critical water catchment areas, and enforcement through the Joint Enforcement Unit (JEU). The audit assessed the Agency's performance in these areas and made the following observations.

9. The Agency was yet to undertake a comprehensive survey and mapping of the eighteen (18) gazetted water towers. This was with the exception of the Maasai Mau Block within the Mau Forest Complex where the Agency oversaw the mapping and

realignment of 60 km out of its 119 km boundary. Further, according to the Maasai Mau Phase II Action Plan, the Agency had targeted to construct an electric smart fence along the Maasai Mau Block covering its entire 119 km boundary within two (2) years, starting from August 2019. However, only 30 km of the fence had been constructed as at the time of audit.

10. The Agency had planned in its Strategic Plan (2016-2020) to identify, map and gazette critical water catchment areas. However, the audit revealed that the Agency had identified critical water catchments in nine (9) water towers, out of which only three (3) were among the eighteen (18) gazetted. Good practice require that the Agency prioritises gazetted water towers when planning and implementing its water tower conservation activities. For instance, critical water catchments were yet to be identified and assessed in major water towers such as the Mt. Kenya, Aberdare Ranges, Cherangani Hills, Mt. Elgon and the entire Mau Forest Complex, except for Maasai Mau. In addition, while gazettement is a necessary pre-condition for protection, none of the identified critical catchment land had been surveyed and gazetted as at the time of audit.

11. Further, the Joint Enforcement Unit (JEU),[2] established to provide a multi-agency approach to protection of the Mau Forest Complex, did not seem to be effective in deterring deforestation activities. A review of JEU monthly reports revealed that approximately 69,085 cedar posts and 5, 000 bags of charcoal were seized by JEU officers during the period January 2017 to December 2022. However, four (4) out of the six (6) years under review had missing reports for nineteen (19) months. The actual destruction may therefore be higher than the figures presented in this report.

12. Due to inadequate implementation of protection measures, water towers were exposed to destructive human activities, leading to degradation. A review of land use and land cover data, since 1990, for the sampled nine (9) water towers revealed a declining trend in forest cover in Cherangani, Chyulu, Loita water towers and Maasai

[2] Joint Enforcement Unit (JEU) is a multi-agency enforcement unit whose membership comprise of officers from Kenya Forest Service (KFS), Kenya Wildlife Service (KWS), County Government of Narok, and National Police Service/Rapid Deployment Unit under the coordination of KWTA.

Mau, South Mau, and South West Mau `blocks. The Aberdare Ranges, Cherangani, Loita Hills, Mt. Marsabit water towers and South Mau Block had an increasing trend in crop land, depicting encroachment.

13. The declining forest cover, combined with an increase in crop land, has had a negative impact on water availability. This has negatively affected the achievement of SDG 6 Target 1 on universal and equitable access to safe and affordable drinking water for all by 2030. Interviews with the Agency's staff, review of water tower status assessment reports, and analytical review of water quantity data revealed that most of the rivers and springs emanating from the sampled nine (9) water towers have reduced in volumes over the years. This has been attributed to destructive human activities.

14. The inadequacies in the implementation of water towers protection measures were attributed to delays in the enactment of water tower the legal framework, among other factors. The Agency had drafted the Water Towers Conservation and Coordination Policy, 2019 and Kenya Water Towers Bill, 2019 with provisions on stakeholder engagement and coordination. The documents were however still in draft form as at the time of audit. The audit established that the Agency operated under a legal notice which did not expressly state overseeing water tower boundary mapping and gazettement of critical catchment areas as one of its functions.

2. Rehabilitation of Degraded Sites Within Water Towers

15. The Agency's performance in rehabilitation of degraded water towers was assessed through activities geared towards reclamation of encroached water tower land and reforestation of degraded sites. The audit observations were as follows.

16. Using a multi-agency approach, the Government undertook reclamation interventions in the Mau Forest Complex since 2008, under the coordination of the Agency. However, the Agency did not provide information on the total area reclaimed, as well as the targeted locations. This was with the exception of the 4,500 hectares (Ha) in

Nkoben area and 8,869 Ha in "Status Quo"[3] area of the Maasai Mau Block recovered in 2018 and 2019, respectively. While some of the encroachers had land ownership documents, the Agency did not provide evidence to confirm revocation of such documents. The audit therefore could not ascertain whether the reclamation process was completed and encroached land reverted back to forest reserve.

17. Several challenges affected reclamation efforts, namely; lack of comprehensive information on the level of encroachment, unclear water tower boundary, and conflicting boundaries. Due to insufficient reclamation, the Mau Forest Complex and other water towers continue to experience encroachment challenges, leading to their degradation.

18. Further, the Agency rehabilitated eleven (11) water towers through tree planting during the period 2017/18 to 2021/22. However, while good practice would have required prioritization of gazetted water towers, seven (7) out of the eleven (11) water towers rehabilitated were non-gazetted. Besides, the Agency's reforestation activities were limited in scale and reported low survival rates of planted tree seedlings.

19. A total of 189,028 Ha was under high level of degradation in the nine (9) sampled water towers**.** However, the Agency reforested 7,372.5 Ha, representing 3.9% of the total area that required reforestation, either directly or through other actors. In addition, while the Agency's recommended seedling survival rate was 80% for a reforestation intervention to be considered successful, only two (2) out of the seven (7) sites whose seedling audit reports were availed for audit had a survival rate of 80% and above. The low survival rate was also observed during audit inspections in Nyambene Hills, Shimba Hills and the Maasai Mau Block, where patches of bare land were observed in reforested areas.

[3] "Status Quo" covered Kamwengoi, Siera Leone and Kipchoge areas bordering Ol Pusimoru forest in Maasai Mau.

20. The audit attributed the inadequate reforestation of degraded sites to the lack of documented guidelines on tree planting in water towers in general. This in turn negatively affected reforestation activities, through: low seedling production; challenges with procurement of seedlings; lack of securing of rehabilitated sites; and failure to weed reforested sites.

21. Due to limited coverage of areas that required reforestation and low seedling survival rates, water towers were still under high level of degradation, despite the Agency's rehabilitation efforts.

3. Community Alternative Livelihood Interventions

22. The Agency undertook to establish a national bamboo demonstration centre at Kaptagat Forest in Elgeyo Hills, in the year 2018/19 to promote bamboo commercialization among forest adjacent communities. The site was to be used for production of bamboo seedlings and serve as a community learning centre. However, audit revealed the site was neglected and had minimal activity towards establishing a bamboo demonstration centre. This is despite the Agency having utilised approximately Ksh. 147.7 million 2017/2018 to 2021/2022 towards establishment of bamboo enterprise.

23. Further, the Agency's efforts to promote honey production as an alternative livelihood among the forest adjacent community recorded poor results. Out of the 1,135 beehives distributed by the Agency to eight (8) groups, spread across five (5) water towers within the audit sample, 665 were inspected and revealed colonisation in only 93 hives, representing 14% colonisation rate. Besides, the beneficiary groups were issued with both beehives and honey processing tools and equipment. However, only one (1) out of the eight (8) groups had established a honey processing factory. Some of the challenges

experienced by beneficiary groups included; pest infestation, lack of skills on apiary management, and poor location of the apiary[4].

24. Similar observations of low success rates were observed in the charcoal briquette enterprise intervention in the Maasai Mau Block. Physical inspection revealed that the briquette enterprise was small in scale and would not have economic impact on the beneficiaries. Further, interactions with group members revealed that the Agency did not provide them with a mechanical crusher, despite it being critical for large scale production. In addition, the group members were not trained on charcoal briquette making, which led to production of poor-quality briquettes. As at the time of the audit, production of charcoal briquettes was limited to members own consumption at household level.

25. The audit attributed the inadequacies in community alternative livelihood interventions to inadequate capacity building of beneficiary groups, failure to provide beneficiaries with technical assistance, and lack of monitoring by the Agency.

4. Stakeholder Engagement and Coordination

26. The audit revealed that there were no structures in place for coordination of actors involved in the conservation of water towers. As a result, actors involved in conservation of water towers could not share information among themselves. Interviews with the Agency's staff revealed that as part of the development of the Integrated Monitoring System, the Agency was working with stakeholders to develop information sharing protocols. The protocols are expected to provide a platform for information sharing among stakeholders.

27. In addition, the Agency did not provide evidence of strategic partnership arrangements, except for the Maasai Mau Block, where adopt-a-block strategy was

[4] An apiary refers to a collection of beehives, located in one place, where bees are kept to provide honey.

used. Adopt-a-block is a strategy used by the Agency to rehabilitate the parcel of land reclaimed in the Maasai Mau Block in 2019. The reclaimed land was divided into small blocks measuring 100 Ha, which interested actors were to adopt and rehabilitate under the coordination of the Agency. However, due to unclear implementation structures, adoptees did not reforest the total pledged area and failed to maintain the reforested areas, leading to low success rates of the strategy.

28. The audit attributed inadequate coordination and stakeholder involvement to the lack of a stakeholder engagement framework and guiding legal framework. It was noted that the Agency had drafted the Water Towers Conservation and Coordination Policy, 2019 and Kenya Water Towers Bill, 2019 with provisions on stakeholder engagement and coordination.

5. Water Towers Assessment and Monitoring of Conservation Activities

29. The audit established that while the Agency had the mandate to monitor water tower conservation activities implemented by all actors, its monitoring was restricted to Agency's own activities. Besides, the Agency's monitoring activities were only limited to seedling survival rate audits meant to monitor performance of sites reforested by the Agency. Further, the audit noted that while the seedling survival rate audits were done at the headquarters level, the regional offices did not receive feedback on the sites audited.

30. The audit revealed that the Agency conducted twenty-eight (28) water tower status assessments, out of which fifteen (15) had been published as at the time of audit. While good practice requires that the Agency prioritize gazetted water towers, seven (7) out of the fifteen (15) published assessment reports were for non-gazetted water towers. Critical water towers such as the Aberdare Ranges and Mt. Kenya had not been assessed. Besides, only five (5) out of the twenty-two (22) blocks in the Mau Forest Complex had been assessed. The audit also observed that the Agency took between two (2) to three (3) years to finalise and publish the assessment reports. Therefore, the published reports may lack current information on the status of the assessed water towers.

31. As a result of inadequate water tower assessment and limited monitoring, the Agency not only lacked up to date information on the status of its activities, but also those implemented by other actors. The audit attributed the inadequate monitoring of activities to a number of factors, namely: lack of implementation of the Water Towers Ecosystem Monitoring Framework; lack of activity level indicators, and limited number of monitoring and evaluation staff, as well as lack of representation of key technical departments at the Agency's regional offices.

Conclusion

32. From the findings of the audit, it was evident that the Agency had implemented various interventions in a bid to conserve water towers. However, the implementation was faced with various challenges, limiting the success of the interventions. There is inadequate implementation of protection and rehabilitation interventions. In addition, implementation of conservation activities is concentrated in the non-gazetted water towers. Despite conservation of water towers being multi-sectoral, stakeholder engagement and coordination is still a challenge, mainly due to the lack of a legal framework. Besides, the Agency has not put much emphasis on monitoring of conservation activities, despite it being key to successful implementation of water towers conservation interventions. The findings of this audit show minimal progress in achievement of SDG 6 Target 6, which required member states to protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes by 2020. The Government's efforts in expanding safe water coverage in the Country may be an exercise in futility if interventions put place for conserving water towers are not implemented.

33. Failure to enact an enabling legal framework has hindered the Agency's efforts to implement water tower conservation interventions. This has resulted in the water tower boundaries not being surveyed and demarcated, making them susceptible to encroachment. In addition, critical water catchment areas within water towers have not been gazetted. Besides, the Agency is established as a lead coordinator through a legal notice, yet it is expected to coordinate conservation activities of various actors, including the Kenya Wildlife Services and the Kenya Forest Service.

34. Reforestation is a necessary step towards rehabilitation of degraded water towers. However, the success of any reforestation exercise is dependent on several factors, including; maturity stage of the seedling, timing of planting, travelling distance during sourcing of seedlings, security of the planted area, and maintenance of the planted seedlings. Despite the investments in tree planting, the Agency did not pay close attention to the success factors, hence most planted sites recorded low seedling survival rate.

35. The objective of easing pressure from forest resources remains elusive despite the Agency's investments in several nature-based projects meant to provide alternative livelihoods to forest adjacent communities. The Agency has failed to address the sustainability component of alternative livelihood interventions, leading to low success rates.

Recommendations

36. In view of the findings and conclusions of the audit, the following is recommended for consideration by the Agency to improve on the conservation of water towers: -

I) To ensure adequate protection of water towers, the Agency should:

i) Work closely with the State Department for Environment and Climate Change to fast-track the enactment of the Water Towers Conservation and Coordination Policy, 2019 and Kenya Water Towers Bill, 2019. This will strengthen the Agency's mandate as a lead coordinator and overseer in water tower conservation;

ii) Implement the Framework for Resource Mobilization and Engagement of Development Partners, giving priority to operationalization of the Water Tower Conservation Fund and Adopt-a-Water Tower Programme; and

iii) Fast track the development and implementation of the Guidelines for Engagement With the Joint Enforcement Unit (JEU). The Guidelines should outline clear roles and responsibilities for each party, with a focus on sustainable operations of the Unit.

II) To ensure adequate rehabilitation of water towers, the Agency should:

i) Survey and map the gazetted water towers and undertake a comprehensive assessment of the level of encroachment;

ii) Develop and implement guidelines on tree planting in water towers. The guidelines should emphasise a shift of focus from planting trees to growing trees. The guidelines should also address critical issues such as quality of seedlings to be planted, sourcing of seedlings, security of planted sites, maintenance of the planted sites, and seedling survival rate requirements; and

iii) Develop tree planting targets, with clear and measurable deliverables. This will ensure tracking of progress in reforestation interventions.

III) To ensure sustainability of community alternative livelihoods, the Agency should:

i) Coordinate with the relevant stakeholders to ensure that beneficiary groups are adequately trained before engaging them on nature-based enterprises, including seedling production; and

ii) Coordinate with relevant stakeholders to ensure that they provide technical assistance to beneficiary groups throughout the life time of nature-based projects.

IV) To ensure active involvement of stakeholders in conservation of water towers, the Agency should develop and implement a comprehensive stakeholder engagement framework. The framework should provide guidance on strategic partnerships, information sharing, and coordination.

V) To facilitate monitoring of water tower conservation activities, the Agency should:

i) Implement the Water Towers Ecosystem Monitoring Framework, including operationalization of the Integrated Water Tower Monitoring System;

ii) Streamline its human resources function to ensure all key departments are represented in the Agency's regional offices, with adequate staff; and

iii) Develop intervention specific activity-level indicators. This will ensure that monitoring of the conservation interventions is carried out at the activity level.