Approved SNA 6/8/24.

REPUBLIC OF KENYA
THE NATIONAL ASSEMBLY
THIRTEENTH PARLIAMENT – THIRD SESSION – 2024

DIRECTORATE OF DEPARTMENTAL COMMITTEES

DEPARTMENTAL COMMITTEE ON ENVIRONMENT, FORESTRY AND MINING

.....

REPORT

ON
CONSIDERATION OF THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION (AMENDMENT) BILL, 2023

DIRECTORATE OF DEPARTMENTAL COMMITTEES,
CLERK'S CHAMBERS,
PARLIAMENT BUILDINGS,
NAIROBI.

JULY, 2024

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LIST OF ABBREVIATIONS AND ACRONYMS

UDA	-	United Democratic Alliance
ODM	-	Orange Democratic Movement
WDP	-	Wiper Democratic Party
KUP	-	Kenya Union Party
UPIA	-	United Party of Independent Alliance

LIST OF ANNEXURES

1. Report adoption Schedule
2. Minutes
3. Copy of the newspaper advertisement on public participation
4. Letter inviting stakeholders for meetings with the Committee
5. Stakeholder submissions

CHAIRPERSON'S FOREWORD

This report contains proceedings of the Departmental Committees on Environment, Forestry and Mining on its consideration of the Environmental Management and Co-ordination (Amendment) Bill, 2023 which was published on 19th October 2023. The Bill went through the First Reading on 6th December 2023 and was thereafter committed to the Departmental Committee on Environment, Forestry and Mining for consideration and reporting to the House pursuant to the provisions of the National Assembly Standing Order 127.

The Bill which is sponsored by Hon. Irene N. Mayaka, MP has two clauses and *seeks to amend Section 147 of the Environmental Management and Co-ordination Act, No. 8 of 1999 to permit the Cabinet Secretary to make regulations to prohibit the introduction, growth or maintenance of trees of the eucalyptus species along any river, lake, sea and wetlands.*

The Bill concerns county governments in terms of Article 110 (1) (a) of the Constitution. It affects the functions of the county governments under Paragraph 10 of Part 2 of the Fourth Schedule to the Constitution on the implementation of specific national government policies on natural resources and environmental conservation.

Following placement of advertisements in the print media on Saturday, 9th December 2023 seeking public and stakeholder views on the Bill pursuant to Article 118(1) (b) of the Constitution and Standing Order 127(3), the Committee received a memorandum from the Mau Mau War Veterans.

The Committee also invited the Ministry of Environment, Climate Change and Forestry vide a letter **REF: NA/DDC/EF&M/2024/009** dated **11th March, 2024** for their comments and proposals on the Bill and the Committee received memorandum from the Kenya Forestry Research Institute (KEFRI).

The Committee also invited Hon. Irene N. Mayaka for an engagement meeting on the Bill vide letter **REF: NA/DDC/EF&M/2024/010** dated 21st March 2024.

The Committee having considered the Environmental Management and Co-ordination (Amendment) Bill, 2023, observed that the Bill should be amended to prohibit the growth or maintenance of any eucalyptus species including any other potentially dangerous species such as *Prosopis Juliflora (Mathenge)* or other invasive species along any river, lake, sea or wetland. The Committee therefore recommends that the House **approves the Bill with amendments as reported by the Committee.**

The Committee is grateful to the Offices of the Speaker and the Clerk of the National Assembly for the logistical and technical support accorded to it during its sittings. The Committee further wishes to thank the sponsor of the Bill, Hon. Irene N. Mayaka and all stakeholders who submitted their comments on the Bill. Finally, I wish to express my appreciation to the Honorable Members of the Committee and Secretariat who made useful contributions towards consideration of the Bill and production of this report.

On behalf of the Departmental Committee on Environment, Forestry and Mining and pursuant to provisions of Standing Order 127 (4), it is my pleasant privilege and honour to present to this House the Report of the Committee on its consideration of the Environmental Management and Co-ordination (Amendment) Bill, 2023.

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HON. GIKARIA DAVID, M.P.
CHAIRPERSON, DEPARTMENTAL COMMITTEE ON ENVIRONMENT, FORESTRY AND MINING

PART ONE

1.0 PREFACE

1.1 ESTABLISHMENT OF THE COMMITTEE

1. The Departmental Committee on Environment, Forestry and Mining is one of the twenty Departmental Committees of the National Assembly established under **Standing Order 216** whose mandate pursuant to the **Standing Order 216 (5)** is as follows:

    i. *To investigate, inquire into, and report on all matters relating to the mandate, management, activities, administration, operations and estimates of the assigned ministries and departments;*
    ii. *To study the programme and policy objectives of Ministries and departments and the effectiveness of their implementation;*
    iii. *On a quarterly basis, monitor and report on the implementation of the national budget in respect of its mandate;*
    iv. ***To study and review all the legislation referred to it;***
    v. *To study, assess and analyse the relative success of the Ministries and departments as measured by the results obtained as compared with their stated objectives;*
    vi. *To investigate and inquire into all matters relating to the assigned Ministries and departments as they may deem necessary, and as may be referred to them by the House;*
    vii. *To vet and report on all appointments where the Constitution or any law requires the National Assembly to approve, except those under Standing Order 204 (Committee on appointments);*
    viii. *To examine treaties, agreements and conventions;*
    ix. *To make reports and recommendations to the House as often as possible, including recommendation of proposed legislation;*
    x. *To consider reports of Commissions and Independent Offices submitted to the House pursuant to the provisions of Article 254 of the Constitution; and*
    xi. *To examine any questions raised by Members on a matter within its mandate.*

1.2 MANDATE OF THE COMMITTEE

2. In accordance with the Second Schedule to the Standing Orders, the Committee is mandated to consider matters related to climate change, environment management and conservation, forestry, mining and natural resources, pollution and waste management.

3. In executing its mandate, the Committee oversees the Ministry of Environment, Climate Change and Forestry and the State Department for Mining.

1.3 COMMITTEE MEMBERSHIP

4. The Departmental Committee on Environment, Forestry and Mining was constituted by the House on 27th October 2022 and comprises of the following Members:

Chairperson
Hon. David Gikaria, MP
Nakuru Town East Constituency
UDA Party

Vice-Chairperson
Hon. Charles Kamuren, MP
Baringo South Constituency
UDA Party

Members

Hon. Mbalu Jessica Nduku Kiko, CBS, MP
Kibwezi East Constituency
WDP Party

Hon. Mwanyanje Gertrude Mbeyu, MP
Kilifi County
ODM Party

Hon. Hiribae Said Buya, MP
Galole Constituency
ODM Party

Hon. Salim Feisal Bader, MP
Msambweni Constituency
UDA Party

Hon. Emathe Joseph Namuar, MP
Turkana Central Constituency
UDA Party

Hon. Joseph Wainaina Iraya, MP
Nominated
UDA Party

Hon. Kemei Beatrice Chepngeno, MP
Kericho County
UDA Party

Hon. Kururia Elijah Njore Njoroge, MP
Gatundu North Constituency
Independent Member

Hon. Masito Fatuma Hamisi, MP
Kwale County
ODM Party

Hon. Nguro Onesmus Ngogoyo, MP
Kajiado North Constituency
UDA Party

Hon. Titus Lotee, MP
Kachaliba Constituency
KUP Party

Hon. Mohamed Tubi Bidu, MP
Isiolo South Constituency
Jubilee Party

Hon. Yakub Adow Kuno, MP
Bura Constituency
UPIA Party

1.4 COMMITTEE SECRETARIAT

5. The Committee is facilitated by the following staff:

Ms. Hellen Ekadeli
Clerk Assistant II/Head of Secretariat

Ms. Mercy Wanyonyi
Senior Legal Counsel

Dr. Joseph Kuria
Research Officer III

Mr. Stephen Otieno
Senior Sergeant-At-Arms

Mr. Eric Ogola
Public Communications Officer III

Mr. Hamdi Hassan Mohamed
Clerk Assistant III

Ms. Nancy Chamunga
Fiscal Analyst III

Mr. Kevin Obilo
Media Relations Officer III

Mr. Sakani Meldrick
Audio Recording Officer

PART TWO

2.0 BACKGROUND OF THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION (AMENDMENT) BILL, 2023

2.1 INTRODUCTION

6. The principal object of the Bill is to amend Section 147(2) of the Environment Management and Coordination Act, No. 8 of 1999 by inserting a new paragraph (ba).

7. The subsection provides that the Regulations made by the Cabinet Secretary may *"make provisions for prohibition of the introduction, growth or maintenance of trees of eucalyptus species in and along any river, lake, sea or wetland".*

8. This is meant to remove the water-intensive eucalyptus trees from water catchment areas and thus preserve groundwater and prevent the reduction of water levels.

2.2 SITUATIONAL ANALYSIS

9. Eucalyptus trees cover about 20 million hectares in more than 90 countries around the world with major areas in Brazil (5.7 m ha), India (3.9 m ha) and China (4.5 m ha).

10. Eucalypts are widely grown in commercial plantations to produce raw material for the industry (pulp and paper, charcoal, sawn timber, wood panels) but also in small woodlots for the production of firewood and charcoal for domestic uses.

11. In Kenya, eucalypts were introduced in 1902 to provide fuelwood for the Kenya-Uganda railway. Currently, eucalypts are used for fuelwood, timber, plywood, transmission poles, pulp, building materials, fencing posts, windbreaks and ornamentals.

12. Eucalypts are grown in most ecological zones in Kenya and on a variety of soils including infertile sands and heavy clays. In 2010, the total area under eucalypts in Kenya was about 100, 000 Ha distributed in gazetted forests and land owned by large private companies, small-scale farmers and local authorities.

13. Eucalyptus, a fast-growing tree species, has gained popularity in various industries due to its numerous uses and economic benefits. However, its rapid growth and extensive water consumption make it highly unsuitable for planting near water bodies and wetlands.

14. The impact of eucalyptus on these delicate ecosystems can be detrimental and long-lasting. Wetlands, particularly, are fragile habitats that provide essential ecological services, such as water purification and flood control. The planting of eucalyptus in such areas can disrupt these vital functions.

15. Kenya Forest Service developed guidelines providing for the areas where Eucalyptus should not be planted. They include:
    i. Wetlands and marshy areas
    ii. Riparian areas.

a) Along rivers (reserve not less than 30 meters as stipulated in the Survey Act Cap 299 of the Laws of Kenya. In addition, allow for an extra 20 meters to ensure that the trees do not adversely interfere with the water source).
b) Areas around lakes, ponds, swamps, estuary and any other body of standing water.
c) Irrigated farmlands.
d) Areas with less than 400mm of rainfall.
e) In farms next to water sources, planting should be minimized by inter-planting with indigenous tree species or in mosaic plantations between indigenous trees with the 19 latter occupying a greater percentage or strip planting of eucalyptus with natural vegetation.

16. White *et al.* (2002) reported that the roots of Eucalyptus penetrate deeper soil layers and can extract water from reservoirs in addition to that from rainfall.

17. Robert (2005) observed that when eucalypts were cleared from the river systems, the flow of the river was restored to normal within a decade, indicating that the groundwater accumulates and springs up.

18. **Article 69 of the Constitution of Kenya, 2010** provides that the State shall eliminate processes and activities that are likely to endanger the environment and ensure sustainable utilization, management and conservation of the environment.

19. Accordingly, in response to the ecological threat of the noxious ***Prosopis Juliflora (Mathenge)*** tree species, Cabinet on 13th March, 2024 considered and approved the rollout of a national strategy and an action plan for the management and control of this invasive tree species. It was noted that the tree species was introduced in the 1970s to mitigate soil erosion, fuelwood shortages, inadequate livestock fodder, and other challenges associated with bare lands in the Arid and Semiarid areas (ASALs). Subsequently however, it was realized that its rapid spread leads to loss of biodiversity and farmlands, increased livestock deaths arising from consumption of its leaves and thorns and increased spread of malaria.

20. Further, it was observed that the Government had declared the said tree species a noxious weed in the year 2006 and banned its introduction outside the already infested areas in the country. Since 2006, the invasion has manifested in 16 more counties, with the largest infestation being found in the following eight counties: Turkana, Tana-River, Garissa, Isiolo, Marsabit, Kajiado, Taita-Taveta, and Baringo. Other counties with a considerable presence of the invasive tree species are Kilifi, Samburu, Mandera, Wajir, Kwale, Lamu, Tharaka-Nithi, Meru, Mombasa, Migori, Kitui, and West-Pokot.

21. Upon consideration of the devastating negative consequences of the tree species on the overall ecosystem, and the livelihoods of pastoral communities and farmers threatened by loss of critical dry season grazing areas, pasture, and cropping areas, it was noted that the extent of invasion had escalated to emergency stage of the national disaster-risk index assessment scale. In that regard, an inter-ministerial committee constituted of the Ministries of Environment, Agriculture and Energy was placed in charge of the implementation of the national strategy and action plan for the management and control of this invasive tree species.

2.3 COMPARATIVE ANALYSIS

2.3.1 SOUTH AFRICA

22. South Africa has implemented regulations that restrict the planting of eucalyptus trees within specified distances from rivers, wetlands, and other sensitive areas. These measures were put in place to protect water quality, prevent invasive species encroachment, and maintain ecological integrity.

23. The regulations vary by province, but they generally prohibit the planting of eucalyptus trees within 100 meters of a river or wetland. In some cases, the restrictions are even more stringent. For example, in the **Western Cape Province**, it is illegal to plant eucalyptus trees within 500 meters of a river or wetland.

2.3.2 BRAZIL

24. In Brazil, the state of **Rio Grande do Sul** banned the planting of eucalyptus trees within **1,000 meters** of water bodies in 2006. The legislation aimed to protect water resources, prevent soil erosion and preserve native vegetation in riparian areas.

2.3.3 AUSTRALIA

25. While eucalyptus trees are native to Australia, there have been instances where planting them near water bodies has been restricted or discouraged.

26. In certain states, for example, in **New South Wales** and **Victoria**, it is illegal to plant eucalyptus trees within 100 meters and 50 meters of water bodies respectively without a permit.

2.3.4 CANADA

27. In Canada, the Fisheries Act (1985) allows Canada's government to establish a list of aquatic invasive species and create regulations with respect to the management and control of these species. This includes regulations regarding prevention, possession, release, handling, treatment, and eradication of aquatic invasive species.

PART THREE

3.0 OVERVIEW OF THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION (AMENDMENT) BILL, 2023.

3.1 INTRODUCTION

28. The Environmental Management and Co-ordination (Amendment) Bill, 2023 is a Bill sponsored by Hon. Irene N. Mayaka, seeking to amend Section 147 of the Environmental Management and Co-ordination Act, No. 8 of 1999 to permit the Cabinet Secretary to make regulations to prohibit the planting of eucalyptus trees along rivers, lakes, seas and wetlands.

29. This is meant to remove the water-intensive eucalyptus trees from the water catchment areas and thus preserve ground water and prevent the reduction of water levels.

3.2 REVIEW OF THE BILL

30. The principal object of the Bill is to amend Section 147 of the Environmental Management and Co-ordination Act, No. 8 of 1999 to permit the Cabinet Secretary to make regulations to prohibit the introduction, growth or maintenance of trees of the eucalyptus species in and along any river, lake, sea and wetland.

31. **Clause 1** of the Bill provides the short title.

32. **Clause 2** of the Bill provides for the insertion of a new paragraph (ba) in subsection (2) of section 147 of the Environmental Management and Co-ordination Act, No. 8 of 1999 to allow the Cabinet Secretary to make regulations to provide for the prohibition of the introduction, growth or maintenance of trees of the eucalyptus species in and along any river, lake, sea or wetland.

PART FOUR

4.0 PUBLIC PARTICIPATION/STAKEHOLDERS CONSULTATION

33. Following the call for memoranda from the public through placement of adverts in the print media on Saturday, 9th December 2023 and vide a letter REF: NA/DDC/ EF&M/2024/009 dated 11th March 2024 inviting stakeholders for a meeting, the Committee received memorandum from the Mau Mau War Veterans.

34. The Committee also invited the Ministry of Environment, Climate Change and Forestry vide a letter **REF: NA/DDC/EF&M/2024/009** dated **11th March 2024** for its comments and proposals on the Bill and received submissions from the **Kenya Forestry Research Institute (KEFRI).**

35. The stakeholders submitted as follows:

4.1 KENYA FORESTRY RESEARCH INSTITUTE (KEFRI)

36. The Kenya Forestry Research Institute (KEFRI) in its written submissions submitted as follows:

37. *Eucalyptus* is the tree species with the largest acreage in Kenya, due to its desirable attributes, such as fast growth, multiple uses, suitability to diverse agro-ecological zones small and overall appeal to key sectors of the economy such as manufacturing, construction and energy.

38. The demand for wood and wood products, particularly sawn timber, transmission poles, fencing posts and fuelwood, has been rising rapidly with increase in Kenya's population and economic growth. Currently, the country can only meet 70% of its timber demand (about 49 million m^3 of wood) through domestic supply. The rest is met through imports, which also struggle to bridge the gap.

39. Farmers locally therefore have always grown substitutes, particularly *Eucalyptus* and *Grevillea*, which mature in 10 to 15 years. In most cases, the price for these substitutes is much lower when saw millers' factor in the cost of transporting unprocessed roundwood from farmlands to milling plants.

40. Therefore, growing of eucalyptus needs to be supported because of its economic value but should be restricted to suitable sites. Further, uprooting of Eucalyptus without suitable replacement will lead to more degradation of the riparian areas with possible invasion of invasive species.

41. Scientific evidence and previous information confirm that eucalyptus consume large amounts of water to produce biomass compared to other tree species, reduces groundwater availability and also reduces water flow resulting in the drying up of streams and various water sources. Additionally, Eucalyptus trees have been used to drain swamps and marshy areas.

42. That the fast growth and high biomass yield of Eucalyptus require a high level of water consumption that must be balanced with other competing water uses such as agriculture and domestic needs.

43. Therefore, planting of eucalyptus species should therefore be restricted to sites recommended by the policy guidelines.

44. It is prudent to allow existing Eucalyptus trees to attain maturity or have an agreeable cut-off date for the removal of the trees so that policy and legal directives do not disrupt farmer's plans.

45. Specifically, KEFRI proposed the following amendment to the Bill:

Clause 2

46. Amend clause 2 to read as follows, "*make provisions for the prohibition of the introduction, growth or maintenance of trees of the eucalyptus species* ***or any other potentially dangerous species such as Prosopis or other invasive species*** *in and along any river, lake, sea or wetland".*

Justification-Growing of Eucalyptus needs to be supported because of its economic value. The planting of Eucalyptus in non-suitable sites can be cured through development and enforcement of regulation on Eucalyptus growing in Kenya or planting suitable species in such sites.

Committee observation/recommendation

47. The Committee adopted the proposal.

4.2 MAU MAU WAR VETERANS

48. The Mau Mau War Veterans submitted that they agree with the proposed amendment.

Committee observation/recommendation

49. The Committee noted that the Mau Mau War Veterans supported the Bill.

4.3 HON. IRENE N. MAYAKA

50. In a meeting with the committee held on Tuesday, 19th March 2024, **Hon. Irene N. Mayaka**, submitted the following on the Bill:

51. She highlighted a critical issue in her constituency: the widespread planting of eucalyptus trees near water bodies is causing severe dehydration of local rivers. These trees are incredibly thirsty, with a single eucalyptus tree capable of consuming up to seventy liters of water per day in the rainy season and forty liters in the dry season.

52. Hon. Mayaka pointed out that this issue is not just local but potentially widespread, with around 80% of the rivers in Nyamira facing near extinction. The root of the problem is the cultivation of artificial eucalyptus forests along riverbanks, which significantly diminishes the water available for ecosystems and communities.

53. She raised a critical gap in the existing legislation. Section 42 (a)-(h) of the Environmental Management and Coordination Act (1999), as it stands, lacks specificity regarding prohibitions on planting certain species near vital water sources. This omission has led to the unchecked growth of eucalyptus trees near rivers, lakes, seas, and wetlands, posing a threat to water availability and biodiversity.

54. Hon. Mayaka's proposed legislative amendment seeks to address this gap by explicitly banning the cultivation and maintenance of eucalyptus tree species in proximity to water bodies. This amendment is not merely a measure for conserving water in Nyamira but a broader

environmental protection effort. By curbing the planting of such water-intensive trees near vital water sources, the proposed changes aim to preserve these water bodies for the ecological health of the area and the sustenance of future generations. This action underscores a significant move towards more sustainable environmental management and the safeguarding of Kenya's natural resources against the backdrop of increasing environmental challenges.

PART FIVE

5.0 COMMITTEE OBSERVATIONS

55. Having considered the Bill, the Committee made the following observations:

1. Enacting the Environmental Management and Conservation (Amendment) Bill, 2023 (National Assembly Bills No. 66 of 2023) into law will promote the conservation of our waterbodies since the Eucalyptus tree species requires a high level of water for consumption and this makes it highly unsuitable for planting near water bodies and wetlands.

2. Wetlands are fragile habitats that provide essential ecological services such as water purification and flood control and the impact of eucalyptus on these delicate ecosystems can be detrimental and long-lasting as the planting of eucalyptus in such areas can disrupt these vital functions.

3. The growth of Eucalyptus trees needs to be supported because of its economic value but should be restricted to suitable sites while the planting of Eucalyptus trees in non-suitable sites can be cured through the development and enforcement of regulations on Eucalyptus growing in Kenya.

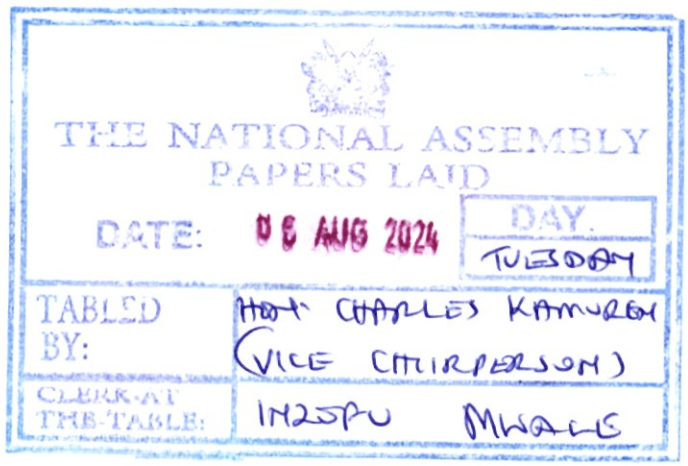
4. It is prudent to allow existing Eucalyptus trees to attain maturity or have an agreeable cut-off date for the removal of the trees so that policy guidelines do not disrupt farmers' plans.

5. The Bill should not be specific to Eucalyptus tree species only but should also include the prohibition of introduction, growth and maintenance of any other potentially dangerous species such as *Prosopis* ***Juliflora (Mathenge)*** **or** other invasive species.

PART SIX

6.0 COMMITTEE RECOMMENDATION

56. The Committee having facilitated public participation and considered the *Environmental Management and Co-ordination (Amendment) (National Assembly Bills No. 66), 2023* by Hon. Irene N. Mayaka, the stakeholder's comments and from the above observations, recommends that the House **APPROVES the Bill with amendments** as proposed in the Schedule in Part Seven of this report.



PART SEVEN

7.0 SCHEDULE OF PROPOSED AMENDMENTS

57. The Committee proposed the following amendments to be considered by the House at the Committee Stage—

CLAUSE 2

58. **THAT,** Clause 2 of the Bill be amended by—

(a) deleting the opening statement and substituting therefore the following new opening statement—

Section 42 of the Environmental Management and Co-ordination Act, 1999 is amended in subsection (3) by inserting the following new paragraph immediately after paragraph (b)—

Justification- The amendment seeks to ensure that the relevant section is amended. Section 42 is specific to the regulations relating to protection of rivers, lakes, seas and wetlands hence the relevant section as opposed to section 147 which is on the general regulations to be made by the Cabinet Secretary.

(b) deleting the words "make provisions for" appearing in the new paragraph (ba); and

Justification- The amendment seeks to ensure that there is coherence between the opening statement and the new paragraph

(c) inserting the following new paragraph immediately after paragraph (ba)—

"(bb) the prohibition of the introduction, growth or maintenance of any invasive species or other potentially dangerous species."

Justification- The amendment seeks to ensure that growing of potentially dangerous species such as *Prosopis* or other invasive species is prohibited through Regulations.

SIGNED..... **DATE**.....

HON. GIKARIA DAVID, MP
CHAIRPERSON,
DEPARTMENTAL COMMITTEE ON ENVIRONMENT, FORESTRY AND MINING

ANNEXURES

Annexure 1:
Adoption Schedule

REPUBLIC OF KENYA
THE NATIONAL ASSEMBLY

THIRTEENTH PARLIAMENT – THIRD SESSION, 2024

DIRECTORATE OF DEPARTMENTAL COMMITTEES

DEPARTMENTAL COMMITTEE ON ENVIRONMENT, FORESTRY AND MINING

ADOPTION OF THE REPORT ON CONSIDERATION OF THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION (AMENDMENT) BILL, 2023

We, the undersigned Honorable Members of the Departmental Committee on Environment, Forestry and Mining today Tuesday, 30th July 2024 do hereby affix our signatures to the Report on consideration of **the Environmental Management and Coordination (Amendment) Bill, 2023 by the Hon. Irene Mayaka, MP** to affirm our approval and confirm its accuracy, validity and authenticity.

NO.	NAME	SIGNATURE
1.	The Hon. Gikaria David, MP - **Chairperson**	
2.	The Hon. Charles Kamuren, MP - **Vice-Chairperson**	
3.	The Hon. Mbalu Jessica Nduku Kiko, CBS, MP.	
4.	The Hon. Mwanyanje Gertrude Mbeyu, MP.	
5.	The Hon. Hiribae Said Buya, MP.	
6.	The Hon. Salim Feisal Bader, MP.	
7.	The Hon. Emathe Joseph Namuer, MP.	
8.	The Hon. Joseph Wainaina Iraya, OGW, MP.	
9.	The Hon. Kemei Beatrice Chepngeno, MP.	
10.	The Hon. Kururia Elijah Njore Njoroge, MP.	
11.	The Hon. Masito Fatuma Hamisi, MP.	
12.	The Hon. Mohamed Tubi Bidu, MP.	
13.	The Hon. Nguro Onesmus Ngogoyo, MP.	
14.	The Hon. Yakub Adow Kuno, MP.	
15.	The Hon. Titus Lotee, MP.	

Annexure 2: Minutes

THE NATIONAL ASSEMBLY

THIRTEENTH PARLIAMENT - THIRD SESSION, 2024
DIRECTORATE OF DEPARTMENTAL COMMITTEES

MINUTES OF THE 34th SITTING OF THE DEPARTMENTAL COMMITTEE ON ENVIRONMENT, FORESTRY, AND MINING HELD IN COMMITTEE ROOM 24 FIFTH FLOOR, BUNGE TOWER, PARLIAMENT BUILDINGS ON TUESDAY, 30TH JULY, 2024 AT 12.00 PM.

PRESENT.

1. **The Hon. David Gikaria, CBS, MP** **-Chairperson**
2. The Hon. Salim Feisal Bader, MP
3. The Hon. Yakub Adow Kuno, MP
4. The Hon. Titus Lotee, MP
5. The Hon. Masito Fatuma Hamisi, MP
6. The Hon. Onesmus Ngogoyo Nguro, MP
7. The Hon. Kemei, Beatrice Chepngeno, MP
8. The Hon. Joseph Wainaina Iraya, OGW, MP

APOLOGY

1. **The Hon. Charles Kamuren, MP** **-Vice-Chairperson**
2. The Hon. Mbalu, Jessica Nduku Kiko, CBS, MP
3. The Hon. Tubi Bidu Mohamed, MP
4. The Hon. Emathe Joseph Namuar, MP
5. The Hon. Mwanyanje Gertrude Mbeyu, MP.
6. The Hon. Elijah Njore Njoroge, MP

ABSENT

The Hon. Hiribae Said Buya, MP.

IN-ATTENDANCE: SECRETARIAT

1.	Ms. Hellen Ekadeli	-	Clerk Assistant I
2.	Mr. Hamdi H. Mohamed	-	Clerk Assistant III
3.	Mr. Clinto Sindiga	-	Legal Counsel
4.	Dr. Joseph Kuria, PhD	-	Research Officer III
5.	Ms. Nancy Chamunga	-	Fiscal Analyst
6.	Ms. Kevin Ojiambo	-	Media Relations Officer
7.	Mr. Stephen Otieno	-	Serjeant-At-Arms
8.	Mr. William Ochieng	-	Legal Intern
9.	Ms. Rebecca Muigai	-	Legal intern

AGENDA:

1. Prayers
2. Preliminaries/Introductions
   i. Adoption of the Agenda
   ii. Remarks by the Chairperson
3. Confirmation of Minutes/Matters Arising
4. Communication from the Chair
5. **Consideration and Adoption of the Report on Environmental Management and Coordination (Amendment) Bill, 2023 by the Hon. Irene Mayaka, MP.**
6. Any other Business
7. Adjournment/Date of the next meeting

8. Adjournment/Date of the next meeting

MIN/NO.NA/DC/EF&M/188/2024: PRELIMINARIES & ADOPTION OF AGENDA

The Chairperson called the meeting to order at ten minutes past noon followed by a prayer said by Hon. Fatuma Masito, MP. The agenda of the meeting was adopted as listed above having been proposed and seconded by the Hon. Joseph Wainaina Iraya, OGW, MP and the Hon. Yakub Adow Kuno, MP respectively.

MIN/NO.NA/DC/EF&M/189/2024: CONFIRMATION OF MINUTES OF THE PREVIOUS SITTING.

Confirmation of the Minutes of the previous sittings was deferred to the next meeting

MIN/NO.NA/DC/EF&M/190/2024: CONSIDERATION OF THE REPORT ON ENVIRONMENTAL MANAGEMENT AND COORDINATION (AMENDMENT) BILL, 2023 BY THE HON. IRENE MAYAKA, MP

The Committee were informed that, the principal object of the Bill is to amend Section 147 of the Environmental Management and Co-ordination Act, No. 8 of 1999 to permit the Cabinet Secretary to make regulations to prohibit the introduction, growth or maintenance of trees of the eucalyptus species in and along any river, lake, sea and wetland.

That, **Clause 1** of the Bill provides the short title.

That, **Clause 2** of the Bill provides for the insertion of a new paragraph (ba) in subsection (2) of section 147 of the Environmental Management and Co-ordination Act, No. 8 of 1999 to allow the Cabinet Secretary to make regulations to provide for the prohibition of the introduction, growth or maintenance of trees of the eucalyptus species in and along any river, lake, sea or wetland

MIN/NO.NA/DC/EF&M/191/2024: CONSIDERATION OF THE REPORT ON ENVIRONMENTAL MANAGEMENT AND COORDINATION (AMENDMENT) BILL, 2023 BY THE HON. IRENE MAYAKA, MP

The Committee proposed the following amendments to be considered by the House at the Committee Stage.

CLAUSE 2

1. **THAT,** Clause 2 of the Bill be amended by—
   (a) deleting the opening statement and substituting therefore the following new opening statement—

Section 42 of the Environmental Management and Co-ordination Act, 1999 is amended in subsection (3) by inserting the following new paragraph immediately after paragraph (b)—

Justification- The amendment seeks to ensure that the relevant section is amended. Section 42 is specific to the regulations relating to protection of rivers, lakes, seas and wetlands hence the relevant section as opposed to section 147 which is on the general regulations to be made by the Cabinet Secretary.

(b) deleting the words "make provisions for" appearing in the new paragraph (ba); and

Justification- The amendment seeks to ensure that there is coherence between the opening statement and the new paragraph

(c) inserting the following new paragraph immediately after paragraph (ba)—

"(bb) the prohibition of the introduction, growth or maintenance of any invasive species or other potentially dangerous species."

Justification- The amendment seeks to ensure that growing of potentially dangerous species such as *Prosopis* or other invasive species is prohibited through Regulations.

MIN/NO.NA/DC/EF&M/192/2024: COMMITTEE OBSERVATIONS
Having considered the Bill, the Committee made the following observations:

1) Enacting the Environmental Management and Conservation (Amendment) Bill, 2023 (National Assembly Bills No. 66 of 2023) into law will promote the conservation of our waterbodies since the Eucalyptus tree species requires a high level of water for consumption and this makes it highly unsuitable for planting near water bodies and wetlands.

2) Wetlands are fragile habitats that provide essential ecological services such as water purification and flood control and the impact of eucalyptus on these delicate ecosystems can be detrimental and long-lasting as the planting of eucalyptus in such areas can disrupt these vital functions.

3) The growth of Eucalyptus trees needs to be supported because of its economic value but should be restricted to suitable sites while the planting of Eucalyptus trees in non-suitable sites can be cured through the development and enforcement of regulations on Eucalyptus growing in Kenya.

4) It is prudent to allow existing Eucalyptus trees to attain maturity or have an agreeable cut-off date for the removal of the trees so that policy guidelines do not disrupt farmers' plans.

5) The Bill should not be specific to Eucalyptus tree species only but should also include the prohibition of introduction, growth and maintenance of any other potentially dangerous species such as Prosopis Juliflora (Mathenge) or other invasive species.

MIN/NO.NA/DC/EF&M/193/2024: COMMITTEE RECONMENDATION.
The Committee having reviewed the Environmental Management and Coordination (Amendment) Bill, 2023 (*National Assembly Bill No.66 of 2023*) recommends that the House approves the Bill with amendments as proposed in the schedule in part seven of its Report

MIN/NO.NA/DC/EF&M/195/2024: CONSIDEARTION AND ADOPTION OF THE REPORT ON ENVIRONMENTAL MANAGEMENT AND COORDINATION (AMENDMENT) BILL, 2023 (*NATIONAL ASSEMBLY BILL NO.66 OF 2023*)

The Committee having facilitated public participation and considered the Environmental Management and Co-ordination (Amendment) (National Assembly Bills No. 66 of 2023) by Hon. Irene N. Mayaka, the stakeholder's comments and from the above observations, it

adopted unanimously its Report with amendments as proposed and Seconded by Hon. Titus Lotee, MP and Hon. Feisal Salim Bader, MP respectively.

MIN/NO.NA/DC/EF&M/196/2024: ADJOURNMENT AND DATE OF THE NEXT SITTING

There being no other business, the meeting was adjourned at quarter to two o'clock. The next meeting is to be held on notice.

Signed..... **Date**.....

(HON. GIKARIA DAVID, CBS, M.P. CHAIRPERSON)

THE NATIONAL ASSEMBLY

THIRTEENTH PARLIAMENT - THIRD SESSION, 2024

DIRECTORATE OF DEPARTMENTAL COMMITTEES

MINUTES OF THE 34th SITTING OF THE DEPARTMENTAL COMMITTEE ON ENVIRONMENT, FORESTRY, AND MINING HELD IN COMMITTEE ROOM 24 FIFTH FLOOR, BUNGE TOWER, PARLIAMENT BUILDINGS ON TUESDAY, 30TH JULY, 2024 AT 12.00 PM.

PRESENT.

1. **The Hon. David Gikaria, CBS, MP** **-Chairperson**
2. The Hon. Salim Feisal Bader, MP
3. The Hon. Yakub Adow Kuno, MP
4. The Hon. Titus Lotee, MP
5. The Hon. Masito Fatuma Hamisi, MP
6. The Hon. Onesmus Ngogoyo Nguro, MP
7. The Hon. Kemei, Beatrice Chepngeno, MP
8. The Hon. Joseph Wainaina Iraya, OGW, MP

APOLOGY

1. **The Hon. Charles Kamuren, MP** **-Vice-Chairperson**
2. The Hon. Mbalu, Jessica Nduku Kiko, CBS, MP
3. The Hon. Tubi Bidu Mohamed, MP
4. The Hon. Emathe Joseph Namuar, MP
5. The Hon. Mwanyanje Gertrude Mbeyu, MP.
6. The Hon. Elijah Njore Njoroge, MP

ABSENT

The Hon. Hiribae Said Buya, MP.

IN-ATTENDANCE: SECRETARIAT

1.	Ms. Hellen Ekadeli	-	Clerk Assistant I
2.	Mr. Hamdi H. Mohamed	-	Clerk Assistant III
3.	Mr. Clinto Sindiga	-	Legal Counsel
4.	Dr. Joseph Kuria, PhD	-	Research Officer III
5.	Ms. Nancy Chamunga	-	Fiscal Analyst
6.	Ms. Kevin Ojiambo	-	Media Relations Officer
7.	Mr. Stephen Otieno	-	Serjeant-At-Arms
8.	Mr. William Ochieng	-	Legal Intern
9.	Ms. Rebecca Muigai	-	Legal intern

AGENDA:

1. Prayers
2. Preliminaries/Introductions
   i. Adoption of the Agenda
   ii. Remarks by the Chairperson
3. Confirmation of Minutes/Matters Arising
4. Communication from the Chair
5. **Consideration and Adoption of the Report on Environmental Management and Coordination (Amendment) Bill, 2023 by the Hon. Irene Mayaka, MP.**
6. Any other Business
7. Adjournment/Date of the next meeting

8. Adjournment/Date of the next meeting

MIN/NO.NA/DC/EF&M/188/2024: PRELIMINARIES & ADOPTION OF AGENDA

The Chairperson called the meeting to order at ten minutes past noon followed by a prayer said by Hon. Fatuma Masito, MP. The agenda of the meeting was adopted as listed above having been proposed and seconded by the Hon. Joseph Wainaina Iraya, OGW, MP and the Hon. Yakub Adow Kuno, MP respectively.

MIN/NO.NA/DC/EF&M/189/2024: CONFIRMATION OF MINUTES OF THE PREVIOUS SITTING.

Confirmation of the Minutes of the previous sittings was deferred to the next meeting

MIN/NO.NA/DC/EF&M/190/2024: CONSIDERATION OF THE REPORT ON ENVIRONMENTAL MANAGEMENT AND COORDINATION (AMENDMENT) BILL, 2023 BY THE HON. IRENE MAYAKA, MP

The Committee were informed that, the principal object of the Bill is to amend Section 147 of the Environmental Management and Co-ordination Act, No. 8 of 1999 to permit the Cabinet Secretary to make regulations to prohibit the introduction, growth or maintenance of trees of the eucalyptus species in and along any river, lake, sea and wetland.

That, **Clause 1** of the Bill provides the short title.

That, **Clause 2** of the Bill provides for the insertion of a new paragraph (ba) in subsection (2) of section 147 of the Environmental Management and Co-ordination Act, No. 8 of 1999 to allow the Cabinet Secretary to make regulations to provide for the prohibition of the introduction, growth or maintenance of trees of the eucalyptus species in and along any river, lake, sea or wetland

MIN/NO.NA/DC/EF&M/191/2024: CONSIDERATION OF THE REPORT ON ENVIRONMENTAL MANAGEMENT AND COORDINATION (AMENDMENT) BILL, 2023 BY THE HON. IRENE MAYAKA, MP

The Committee proposed the following amendments to be considered by the House at the Committee Stage.

CLAUSE 2

1. **THAT,** Clause 2 of the Bill be amended by—
   (a) deleting the opening statement and substituting therefore the following new opening statement—

Section 42 of the Environmental Management and Co-ordination Act, 1999 is amended in subsection (3) by inserting the following new paragraph immediately after paragraph (b)—

Justification- The amendment seeks to ensure that the relevant section is amended. Section 42 is specific to the regulations relating to protection of rivers, lakes, seas and wetlands hence the relevant section as opposed to section 147 which is on the general regulations to be made by the Cabinet Secretary.

(b) deleting the words "make provisions for" appearing in the new paragraph (ba); and

Justification- The amendment seeks to ensure that there is coherence between the opening statement and the new paragraph

(c) inserting the following new paragraph immediately after paragraph (ba)—

"(bb) the prohibition of the introduction, growth or maintenance of any invasive species or other potentially dangerous species."

Justification- The amendment seeks to ensure that growing of potentially dangerous species such as *Prosopis* or other invasive species is prohibited through Regulations.

MIN/NO.NA/DC/EF&M/192/2024: COMMITTEE OBSERVATIONS
Having considered the Bill, the Committee made the following observations:

1) Enacting the Environmental Management and Conservation (Amendment) Bill, 2023 (National Assembly Bills No. 66 of 2023) into law will promote the conservation of our waterbodies since the Eucalyptus tree species requires a high level of water for consumption and this makes it highly unsuitable for planting near water bodies and wetlands.

2) Wetlands are fragile habitats that provide essential ecological services such as water purification and flood control and the impact of eucalyptus on these delicate ecosystems can be detrimental and long-lasting as the planting of eucalyptus in such areas can disrupt these vital functions.

3) The growth of Eucalyptus trees needs to be supported because of its economic value but should be restricted to suitable sites while the planting of Eucalyptus trees in non-suitable sites can be cured through the development and enforcement of regulations on Eucalyptus growing in Kenya.

4) It is prudent to allow existing Eucalyptus trees to attain maturity or have an agreeable cut-off date for the removal of the trees so that policy guidelines do not disrupt farmers' plans.

5) The Bill should not be specific to Eucalyptus tree species only but should also include the prohibition of introduction, growth and maintenance of any other potentially dangerous species such as Prosopis Juliflora (Mathenge) or other invasive species.

MIN/NO.NA/DC/EF&M/193/2024: COMMITTEE RECONMENDATION.
The Committee having reviewed the Environmental Management and Coordination (Amendment) Bill, 2023 (*National Assembly Bill No.66 of 2023*) recommends that the House approves the Bill with amendments as proposed in the schedule in part seven of its Report

MIN/NO.NA/DC/EF&M/195/2024: CONSIDEARTION AND ADOPTION OF THE REPORT ON ENVIRONMENTAL MANAGEMENT AND COORDINATION (AMENDMENT) BILL, 2023 (*NATIONAL ASSEMBLY BILL NO.66 OF 2023*)

The Committee having facilitated public participation and considered the Environmental Management and Co-ordination (Amendment) (National Assembly Bills No. 66 of 2023) by Hon. Irene N. Mayaka, the stakeholder's comments and from the above observations, it

adopted unanimously its Report with amendments as proposed and Seconded by Hon. Titus Lotee, MP and Hon. Feisal Salim Bader, MP respectively.

MIN/NO.NA/DC/EF&M/196/2024: ADJOURNMENT AND DATE OF THE NEXT SITTING

There being no other business, the meeting was adjourned at quarter to two o'clock. The next meeting is to be held on notice.

Signed..... **Date**.....30/9/2024.....

(HON. GIKARIA DAVID, CBS, M.P. CHAIRPERSON)

THE NATIONAL ASSEMBLY

THIRTEENTH PARLIAMENT - THIRD SESSION, 2024

DIRECTORATE OF DEPARTMENTAL COMMITTEES

MINUTES OF THE 11TH SITTING OF THE DEPARTMENTAL COMMITTEE ON ENVIRONMENT, FORESTRY, AND MINING HELD IN COMMITTEE ROOM 24, FIFTH FLOOR, BUNGE TOWERS, PARLIAMENT BUILDINGS ON TUESDAY, 19TH MARCH, 2024 AT 12:00 PM.

PRESENT.

1. **The Hon. Gikaria David CBS, MP.** **-Chairperson**
2. **The Hon. Charles Kamuren, MP** **-Vice-Chairperson**
3. The Hon. Mwanyanje Gertrude Mbeyu, MP
4. The Hon. Salim Feisal Bader, MP
5. The Hon. Masito Fatuma Hamisi, MP
6. The Hon. Joseph Wainaina Iraya, MP
7. The Hon. Titus Lotee, MP
8. The Hon. Yakub Adow Kuno, MP
9. The Hon. Tubi Bidu Mohamed, MP
10. The Hon. Emathe Joseph Namuar, MP
11. The Hon. Kemei, Beatrice Chepngeno, MP
12. The Hon. Onesmus Ngogoyo Nguro, MP

APOLOGY

1. The Hon. Mbalu, Jessica Nduku Kiko, CBS, MP
2. The Hon. Elijah Njore Njoroge, MP

ABSENT

The Hon. Hiribae Said Buya, MP.

IN-ATTENDANCE:

SECRETARIAT

1.	Ms. Hellen Ekadeli	-	Clerk Assistant I
2.	Mr. Hamdi H. Mohamed	-	Clerk Assistant III
3.	Ms. Mercy Kinyua	-	Legal Counsel II
4.	Ms. Nancy Chamunga	-	Fiscal Analyst III
5.	Joseph Kuria, PhD	-	Research Officer III
6.	Mr. Kevin Obilo	-	Media Relations Officer III
7.	Mr. Sakani Meldrick	-	Audio Officer III
8.	Mr. Stephen Otieno	-	Serjeant-At-Arms
9.	Mr. Yusuf Adan	-	Intern

SPONSOR OF THE BILL

1. The Hon. Irene Mayaka. MP

AGENDA:

1. Prayers
2. Preliminaries/Introductions

i. Adoption of the Agenda
ii. Remarks by the Chairperson
3. Confirmation of Minutes/Matters Arising
4. **Meeting with State Department for Forestry to discuss matters concerning operations and Management of the State Department**
5. **Submissions by Hon. Irene Mayaka, MP the Environmental Management and Coordination Amendment Bill, 2023**
6. Any other Business
7. Adjournment/Date of the next meeting
8. Adjournment/Date of the next meeting

MIN/NO.NA/DC/EF&M/058/2024: PRELIMINARIES & ADOPTION OF AGENDA

The Chairperson called the meeting to order at five minutes past twelve O'clock followed by a prayer. The agenda of the meeting was adopted as listed above having been proposed and seconded by the Hon. Joseph Wainaina Iraya, MP and the Hon. Ngogoyo Onesmus, MP respectively.

Thereafter, the Chairperson welcomed the Hon. Irene Mayaka, MP to present on the Environmental management and Coordination (Amendment) Bill, 2023

Further, the Chairperson lamented that the operationalization of the Mining Act, 2016 is wanting and needs to be relooked at for proper execution of the mining laws in the country.

MIN/NO.NA/DC/EF&M/059/2024: CONFIRMATION OF MINUTES OF THE PREVIOUS SITTING.

The minutes of the previous sittings were confirmed as follow:

i. The minutes of the 7th sitting held on Thursday, 29th February 2024 were confirmed as a true record of the proceedings having been proposed by the Hon. Onesmus Ngogoyo, MP and seconded by the Hon Joseph Wainaina Iraya, MP.
ii. The minutes of the 8th sitting held on Thursday, 7th March 2024 were confirmed as a true record of the proceedings having been proposed by the Hon. Joseph Wainaina Iraya, MP and seconded by the Hon. Charles Kamuren, MP.
iii. The minutes of the 9th sitting held on Tuesday, 12th March 2024 were confirmed as a true record of the proceedings having been proposed by the Hon. Joseph Wainaina Iraya, MP and seconded by the Hon. Charles Kamuren, MP.
iv. The minutes of the 10th sitting held on Thursday, 14th March 2024 were confirmed as a true record of the proceedings having been proposed by the Hon. Onesmus Ngogoyo, MP and seconded by the Hon. Charles Kamuren, MP.

MIN/NO.NA/DC/EF&M/060/2024: MEETING WITH STATE SEPARTMENT FOR FORESTRY.

The State Department sent an apology letter (Ref No. MECCF/SDF/ADM/15(30)) requesting to reschedule the meeting to a later date, leading to the deferral of this agenda to the next sitting.

MIN/NO.NA/DC/EF&M/061/2024: SUBMISSIONS BY HON. IRENE MAYAKA, MP ON THE ENVIRONMENTAL MANAGEMENT AND COORDINATION (AMENDMENT BILL, 2023)

In a meeting with the committee held on Tuesday, 19th March 2024, **Hon. Irene N. Mayaka**, submitted the following on the Bill:

i. She highlighted a critical issue in her constituency: the widespread planting of eucalyptus trees near water bodies is causing severe dehydration of local rivers. These trees are incredibly thirsty, with a single eucalyptus tree capable of consuming up to seventy liters of water per day in the rainy season and forty liters in the dry season.

ii. Hon. Mayaka pointed out that this issue is not just local but potentially widespread, with around 80% of the rivers in Nyamira facing near extinction. The root of the problem is the cultivation of artificial eucalyptus forests along riverbanks, which significantly diminishes the water available for ecosystems and communities.

iii. She raised a critical gap in the existing legislation. Section 42 (a)-(h) of the Environmental Management and Coordination Act (1999), as it stands, lacks specificity regarding prohibitions on planting certain species near vital water sources. This omission has led to the unchecked growth of eucalyptus trees near rivers, lakes, seas, and wetlands, posing a threat to water availability and biodiversity.

iv. Hon. Mayaka's proposed legislative amendment seeks to address this gap by explicitly banning the cultivation and maintenance of eucalyptus tree species in proximity to water bodies. This amendment is not merely a measure for conserving water in Nyamira but a broader environmental protection effort. By curbing the planting of such water-intensive trees near vital water sources, the proposed changes aim to preserve these water bodies for the ecological health of the area and the sustenance of future generations. This action underscores a significant move towards more sustainable environmental management and the safeguarding of Kenya's natural resources against the backdrop of increasing environmental challenges.

MIN/NO.NA/DC/EF&M/062/2024: COMMITTEE OBSERVATIONS:

The Committee observe the following;

1) The proposed Amendment Bill seeks to amend Section 42 of the Environmental Management and Co-ordination Act to expressly prohibit the growing or maintenance of eucalyptus species along any river, lake, sea, or wetland without the prior written approval of the Authority given after an environmental impact assessment.

2) The proposed amendment can be affected under the regulations instead of enactment as an Act of Parliament.
3) The Environmental Management and Coordination Act (EMCA) of 1999 is adequate to prevent the cultivation of eucalyptus trees in close proximity to wetland areas.
4) The implementation of the EMCA Act, 1999 is deficient.
5) If the amendment is passed, it will create a situation where similar amendments could be enacted for other species, potentially leading to unforeseen consequences.

MIN/NO.NA/DC/EF&M/063/2024: ADJOURNMENT AND DATE OF THE NEXT SITTING.

There being no other business, the meeting was adjourned at 1315hrs. The next meeting is to be held on notice.

Signed..... **Date**.....

(HON. GIKARIA DAVID, CBS, M.P. CHAIRPERSON)

Annexure 3: Environmental Management and Coordination (Amendment) Bill, 2023 (*National Assembly Bill No.66 of 2023*) (Amendment) Bill, 2023

SPECIAL ISSUE

Kenya Gazette Supplement No. 195 (National Assembly Bills No. 66)

REPUBLIC OF KENYA

KENYA GAZETTE SUPPLEMENT

NATIONAL ASSEMBLY BILLS, 2023

NAIROBI, 19th October, 2023

CONTENT

Bill for Introduction into the National Assembly—

PRINTED AND PUBLISHED BY THE GOVERNMENT PRINTER, NAIROBI

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION (AMENDMENT) BILL, 2023

A Bill for

AN ACT of Parliament to amend the Environmental Management and Co-ordination Act and for connected purposes

ENACTED by the Parliament of Kenya, as follows—

Short title.

1. This Act may be cited as the Environmental Management and Co-ordination (Amendment) Act, 2023.

Amendment of Section 147 of No. 8 of 1999.

2. Section 147 of the Environmental Management and Co-ordination Act, 1999 is amended in subsection (2) by inserting the following new paragraph immediately after paragraph (b)—

(ba) make provisions for the prohibition of the introduction, growth or maintenance of trees of the eucalyptus species in and along any river, lake, sea or wetland.

MEMORANDUM OF OBJECTS AND REASONS

Statement of Objects and Reasons for the Bill

The principal object of the Bill is to amend Section 147 of the Environmental Management and Co-ordination Act, No. 8 of 1999 to permit the Cabinet Secretary to make regulations to prohibit the planting of eucalyptus trees along rivers, lakes, seas, and wetlands. This is meant to remove the water-intensive eucalyptus trees from water catchment areas and thus preserve ground water and prevent the reduction of water levels.

Clause 1 of the Bill provides for the short title.

Clause 2 of the Bill provides for the insertion of paragraph (ba) in subsection (2) of section 147 to allow the Cabinet secretary to make regulations to provide for the prohibition of introduction, growth or maintenance of trees of the eucalyptus species in and along any river, lake, sea, or wetland.

Statement on the delegation of legislative powers and limitation of fundamental rights and freedoms

The Bill delegates legislative powers to the Cabinet Secretary but does not limit fundamental rights and freedoms.

Statement that the Bill concerns county governments

The Bill concerns county governments in terms of Articles 110(1)(a) of the Constitution. It affects the functions of county governments under Paragraph 10 of Part 2 of the Fourth Schedule to the Constitution on implementation of specific national government policies on natural resources and environmental conservation.

Statement that the Bill is a money Bill within the meaning of Article 114 of the Constitution

The enactment of this Bill shall not occasion additional expenditure of public funds.

Dated 19th October, 2023

IRENE NYAKERARIO MAYAKA,
Member of Parliament.

Section 147 of the Act which it is proposed to amend

147. Power to make regulations

(1) The Cabinet Secretary may, on the recommendation of the Authority and upon consultation with the relevant lead agencies, make regulations prescribing for matters that are required or permitted by this Act to be prescribed or are necessary or convenient to be prescribed for giving full effect to the provisions of this Act.

(2) Regulations made under subsection (2) may—

(a) make provisions for the issue, amendment and revocation of any licence;

(b) provide for the charging of fees and levying of charges;

(c) adopt wholly or in part or with modifications any rules, standards, guidelines, regulations, by laws, codes, instructions, specifications, or administrative procedures prescribed by any lead agency either in force at the time of prescription or publication or as amended from time to time.

Annexure 4:
NEWSPAPER ADVERT

REPUBLIC OF KENYA

THIRTEENTH PARLIAMENT- SECOND SESSION (2023)

THE NATIONAL ASSEMBLY

IN THE MATTER OF ARTICLE 118(1) (b) OF THE CONSTITUTION
AND
IN THE MATTER OF CONSIDERATION BY THE NATIONAL ASSEMBLY OF:

1. **THE BASIC EDUCATION (AMENDMENT) BILL (NATIONAL ASSEMBLY BILL NO. 59 OF 2023);**
2. **THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION (AMENDMENT) BILL (NATIONAL ASSEMBLY BILL NO. 66 OF 2023);**
3. **THE NATIONAL GOVERNMENT ADMINISTRATION LAWS (AMENDMENT) BILL (NATIONAL ASSEMBLY BILL NO. 73 OF 2023);**
4. **THE LAND LAWS (AMENDMENT) (NO. 2) BILL (NATIONAL ASSEMBLY BILL NO. 76 OF 2023); AND**
5. **THE NATIONAL EMPLOYMENT AUTHORITY (AMENDMENT) BILL (SENATE BILL NO. 48 OF 2023)**

INVITATION TO SUBMIT MEMORANDA

WHEREAS, Article 118(1) (b) of the Constitution requires Parliament to facilitate public participation and involvement in the legislative and other business of Parliament and its Committees and Standing Order 127(3) of the National Assembly Standing Orders requires House Committees considering Bills to facilitate public participation;

AND WHEREAS the Basic Education (Amendment) Bill (National Assembly Bill No. 59 of 2023); the Environmental Management and Co-ordination (Amendment) Bill (National Assembly Bill No. 66 of [illegible] National Government Administration Laws (Amendment) Bill (National Assembly Bill No. 73 of [illegible] Land Laws (Amendment) (No. 2) Bill (National Assembly Bill No. 76 of 2023); and the National [illegible]nt Authority (Amendment) Bill (Senate Bill No. 48 of 2023) have been read a First Time and refer[illegible]o various Committees for consideration and reporting to the House;

IT IS NOTIFIED that:

1. **The Basic Education (Amendment) Bill (National Assembly Bill No. 59 of 2023) sponsored by the Hon. Mary Wamaua, MP,** seeks to amend the Basic Education Act, No. 14 of 2013 to provide for the establishment of Sub-county Education Boards.

2. **The Environmental Management and Co-ordination (Amendment) Bill (National Assembly Bill No. 66 of 2023)** sponsored by the **Hon. Irene Nyakerario Mayaka, MP,** seeks to amend Section 147 of the Environmental Management and Co-ordination Act No. 8 of 1999 to permit the Cabinet Secretary responsible for matters relating to the environment to make regulations prohibiting the planting of eucalyptus trees along rivers, lakes, seas and wetlands. This is meant to remove the water-intensive eucalyptus trees from water catchment areas; preserve ground water and prevent the reduction of water levels.

3. **The National Government Administration Laws (Amendment) Bill (National Assembly Bill No. 73 of 2023)** sponsored by the **Leader of Majority Party, the Hon. Kimani Ichung'wah, MGH, MP,** seeks to amend provisions of the Assumption of Office of the President Act, 2012; the National Security Council Act 2012; the Office of the Attorney-General Act, 2012 and the National Government Co-ordination Act, 2013 to-
   (a) include the Secretary to the National Security Council and the Principal Secretary responsible for Defence as members of the Assumption of Office of the President Committee and increase the nominees of the President-elect within the Committee from three to six members;
   (b) introduce a National Security Advisor as the Secretary to the National Security Council and establish a National Security Council Committee;
   (c) replace the Attorney-General as the custodian of the public seal with the Head of Public Service; and
   (d) establish and delineate the functions of the Head of the Public Service and the offices of the [illegible]hief Administrative Secretary.

4. **[illegible]d Laws (Amendment) (No.2) Bill (National Assembly Bill No. 76 of 2023) sponsored** by the **Leader of the Majority Party, the Hon. Kimani Ichung'wah, MGH, MP,** seeks to amend the Registration of Documents Act, the Land Control Act, the Land Registration Act, 2012, Community Land Act, 2016, and the Sectional Properties Act, 2020 as follows-

   (i) The Registration of Documents Act
   The Bill seeks to inter-alia amend the Registration of Documents Act by decentralizing land registries for registration of documents across the country and align the Registration of Documents Act to the Constitution of Kenya, 2010.

   (ii) The Land Control Act
   The Bill seeks to reconstitute and align Land Control Boards with the governance structure in the Constitution and enable granting consents to transact in agricultural land in accordance with Article 65 of the Constitution which allows non-citizens to own land on leasehold terms not exceeding 99 years.

   (iii) The Land Registration Act, 2012
   The Bill seeks to streamline the registration of long-term leases within the provisions of the Sectional Properties Act, 2020 and to widen the scope under which the Land Registrar can revoke a title obtained through fraud.

   (iv) The Land Act, 2012
   The Bill proposes to clarify the process of allocation of public land and the respective roles played by the National and County governments. The Bill also seeks to separate the roles of renewal and extension of leases and assign them to the National Land Commission and the Cabinet Secretary responsible for matters relating to land.

   (v) The Community Land Act, 2016
   The Bill seeks to allow the Cabinet Secretary responsible for land to complete pending adjudication programmes under the Land Adjudication Act beyond the 2-year period currently permitted by the Act.

   (vi) The Sectional Properties Act, 2020
   The Bill seeks to widen the scope of the Act to include phased developments and introduce a second-tier corporation known as Umbrella Corporation to deal with management issues associated with a big or mixed-use sectional development.

5. **The National Employment Authority (Amendment) Bill (Senate Bill No. 48 of 2023) sponsored by** the **Senator Crystal Asige, MP**, seeks to amend the National Employment Authority Act to introduce provisions to protect the rights, welfare and well-being of Kenyans working overseas.

NOW THEREFORE, in compliance with Article 118(1) (b) of the Constitution and National Assembly Standing Order 127(3) the Clerk of the National Assembly hereby invites the public and stakeholders to submit memoranda on the Bills to the respective Committees listed below:-

S/No.	BILL	COMMITTEE
1.	**The Basic Education (Amendment) Bill (National Assembly Bill No. 59 of 2023)**	**Education**
2.	**The Environmental Management and Co-ordination (Amendment) Bill (National Assembly Bill No. 66 of 2023)**	**Environment, Forestry and Mining**
3.	**The National Government Administration Laws (Amendment) Bill (National Assembly Bill No. 73 of 2023)**	**Justice and Legal Affairs**
5.	**The Land Laws (Amendment) (No.2) Bill (National Assembly Bill No. 76 of 2023)**	**Lands**
6.	**The National Employment Authority (Amendment) Bill (Senate Bill No. 48 of 2023)**	**Committee on Labour & Committee on Diaspora Affairs and Migrant Workers**

Copies of the Bills are available at the National Assembly Table Office, Main Parliament Buildings and on **www.parliament.go.ke/the-national-assembly/house-business/bills**.

The memoranda may be forwarded to the **Clerk of the National Assembly, P.O. Box 41842- 00100, Nairobi;** hand-delivered to the **Office of the Clerk, Main Parliament Buildings, Nairobi;** or emailed to **cna@parliament.go.ke** to be received on or before **Thursday 28th December, 2023** at **5.00 p.m.**

S. NJOROGE
CLERK OF THE NATIONAL ASSEMBLY
9th December, 2023

"For the Welfare of Society and the Just Government of the People"

REPUBLIC OF KENYA

THIRTEENTH PARLIAMENT- SECOND SESSION (2023)

THE NATIONAL ASSEMBLY

IN THE MATTER OF ARTICLE 118(1) (b) OF THE CONSTITUTION
AND
IN THE MATTER OF CONSIDERATION BY THE NATIONAL ASSEMBLY OF:

1. **THE BASIC EDUCATION (AMENDMENT) BILL (NATIONAL ASSEMBLY BILL NO. 59 OF 2023);**
2. **THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION (AMENDMENT) BILL (NATIONAL ASSEMBLY BILL NO. 66 OF 2023);**
3. **THE NATIONAL GOVERNMENT ADMINISTRATION LAWS (AMENDMENT) BILL (NATIONAL ASSEMBLY BILL NO. 73 OF 2023);**
4. **THE LAND LAWS (AMENDMENT) (NO. 2) BILL (NATIONAL ASSEMBLY BILL NO. 76 OF 2023); AND**
5. **THE NATIONAL EMPLOYMENT AUTHORITY (AMENDMENT) BILL (SENATE BILL NO. 48 OF 2023)**

INVITATION TO SUBMIT MEMORANDA

WHEREAS, Article 118(1) (b) of the Constitution requires Parliament to facilitate public participation and involvement in the legislative and other business of Parliament and its Committees and Standing Order 127(3) of the National Assembly Standing Orders requires House Committees considering Bills to facilitate public participation;

AND WHEREAS the Basic Education (Amendment) Bill (National Assembly Bill No. 59 of 2023); the Environmental Management and Co-ordination (Amendment) Bill (National Assembly Bill No. 66 of 2023); the National Government Administration Laws (Amendment) Bill (National Assembly Bill No. 73 of 2023); the Land Laws (Amendment) (No. 2) Bill (National Assembly Bill No. 76 of 2023); and the National Employment Authority (Amendment) Bill (Senate Bill No. 48 of 2023) have been read a First Time and referred to various Committees for consideration and reporting to the House;

IT IS NOTIFIED that:

1. **The Basic Education (Amendment) Bill (National Assembly Bill No. 59 of 2023) sponsored by the Hon. Mary Wamaua, MP,** seeks to amend the Basic Education Act, No. 14 of 2013 to provide for the establishment of Sub-county Education Boards.

2. **The Environmental Management and Co-ordination (Amendment) Bill (National Assembly Bill No. 66 of 2023)** sponsored by the **Hon. Irene Nyakerario Mayaka, MP,** seeks to amend Section 147 of the Environmental Management and Co-ordination Act No. 8 of 1999 to permit the Cabinet Secretary responsible for matters relating to the environment to make regulations prohibiting the planting of eucalyptus trees along rivers, lakes, seas and wetlands. This is meant to remove the water-intensive eucalyptus trees from water catchment areas; preserve ground water and prevent the reduction of water levels.

3. **The National Government Administration Laws (Amendment) Bill (National Assembly Bill No. 73 of 2023)** sponsored by the **Leader of Majority Party, the Hon. Kimani Ichung'wah, MGH, MP,** seeks to amend provisions of the Assumption of Office of the President Act, 2012; the National Security Council Act 2012; the Office of the Attorney-General Act, 2012 and the National Government Co-ordination Act, 2013 to-
   (a) include the Secretary to the National Security Council and the Principal Secretary responsible for Defence as members of the Assumption of Office of the President Committee and increase the nominees of the President-elect within the Committee from three to six members;
   (b) introduce a National Security Advisor as the Secretary to the National Security Council and establish a National Security Council Committee;
   (c) replace the Attorney-General as the custodian of the public seal with the Head of Public Service; and
   (d) establish and delineate the functions of the Head of the Public Service and the offices of the Chief Administrative Secretary.

4. **Land Laws (Amendment) (No.2) Bill (National Assembly Bill No. 76 of 2023) sponsored** by the **Leader of the Majority Party, the Hon. Kimani Ichung'wah, MGH, MP,** seeks to amend the Registration of Documents Act, the Land Control Act, the Land Registration Act, 2012, Community Land Act, 2016, and the Sectional Properties Act, 2020 as follows-

   (i) The Registration of Documents Act
   The Bill seeks to inter-alia amend the Registration of Documents Act by decentralizing land registries for registration of documents across the country and align the Registration of Documents Act to the Constitution of Kenya, 2010.

   (ii) The Land Control Act
   The Bill seeks to reconstitute and align Land Control Boards with the governance structure in the Constitution and enable granting consents to transact in agricultural land in accordance with Article 65 of the Constitution which allows non-citizens to own land on leasehold terms not exceeding 99 years.

   (iii) The Land Registration Act, 2012
   The Bill seeks to streamline the registration of long-term leases within the provisions of the Sectional Properties Act, 2020 and to widen the scope under which the Land Registrar can revoke a title obtained through fraud.

   (iv) The Land Act, 2012
   The Bill proposes to clarify the process of allocation of public land and the respective roles played by the National and County governments. The Bill also seeks to separate the roles of renewal and extension of leases and assign them to the National Land Commission and the Cabinet Secretary responsible for matters relating to land.

   (v) The Community Land Act, 2016
   The Bill seeks to allow the Cabinet Secretary responsible for land to complete pending adjudication programmes under the Land Adjudication Act beyond the 2-year period currently permitted by the Act.

   (vi) The Sectional Properties Act, 2020
   The Bill seeks to widen the scope of the Act to include phased developments and introduce a second-tier corporation known as Umbrella Corporation to deal with management issues associated with a big or mixed-use sectional development.

5. **The National Employment Authority (Amendment) Bill (Senate Bill No. 48 of 2023) sponsored by the Senator Crystal Asige, MP**, seeks to amend the National Employment Authority Act to introduce provisions to protect the rights, welfare and well-being of Kenyans working overseas.

NOW THEREFORE, in compliance with Article 118(1) (b) of the Constitution and National Assembly Standing Order 127(3) the Clerk of the National Assembly hereby invites the public and stakeholders to submit memoranda on the Bills to the respective Committees listed below:-

S/No.	BILL	COMMITTEE
1.	**The Basic Education (Amendment) Bill (National Assembly Bill No. 59 of 2023)**	**Education**
2.	**The Environmental Management and Co-ordination (Amendment) Bill (National Assembly Bill No. 66 of 2023)**	**Environment, Forestry and Mining**
3.	**The National Government Administration Laws (Amendment) Bill (National Assembly Bill No. 73 of 2023)**	**Justice and Legal Affairs**
5.	**The Land Laws (Amendment) (No.2) Bill (National Assembly Bill No. 76 of 2023)**	**Lands**
6.	**The National Employment Authority (Amendment) Bill (Senate Bill No. 48 of 2023)**	**Committee on Labour & Committee on Diaspora Affairs and Migrant Workers**

Copies of the Bills are available at the National Assembly Table Office, Main Parliament Buildings and on **www.parliament.go.ke/the-national-assembly/house-business/bills**.

The memoranda may be forwarded to the **Clerk of the National Assembly, P.O. Box 41842- 00100, Nairobi;** hand-delivered to the **Office of the Clerk, Main Parliament Buildings, Nairobi;** or emailed to **cna@parliament.go.ke** to be received on or before **Thursday 28th December, 2023** at **5.00 p.m.**

S. NJOROGE
CLERK OF THE NATIONAL ASSEMBLY
9th December, 2023

"For the Welfare of Society and the Just Government of the People"

Annexure 5: Letter from the Clerk of the National Assembly inviting/requesting stakeholders views on the Bill.

Annexure 5: SUBMISSIONS

LEGAL BRIEF

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION (AMENDMENT) BILL, 2023- HON. IRENE MAYAKA

	PROVISION IN THE PRINCIPAL ACT	PROPOSED AMENDMENT	RATIONALE/ JUSTIFICATION	OBSERVATIONS
1.	**147. Power to make regulations** (1) The Cabinet Secretary may, on the recommendation of the Authority and upon consultation with the relevant lead agencies, make regulations prescribing for matters that are required or permitted by this Act to be prescribed or are necessary or convenient to be prescribed for giving full effect to the provisions of this Act. (2) Regulations made under subsection (2) may— (a) make provisions for the issue, amendment and revocation of any licence; (b) provide for the charging of fees and levying of charges; (c) adopt wholly or in part or with	Section 147 of the Environmental Management and Co-ordination Act, 1999 is amended in subsection (2) by inserting the following new paragraph immediately after paragraph (b)— "(ba) makes provisions for the prohibition of the introduction, growth or maintenance of trees of the eucalyptus species in and along any river, lake, sea or wetland."	The planting of Eucalyptus trees along rivers, lakes, seas and wetlands is detrimental to water catchment areas as they absorb a lot of water.	The amendment seeks to require the Cabinet Secretary to make Regulations to prohibit the introduction, growing or maintenance of eucalyptus species along any river, lake, sea, or wetlands.

	modifications any rules, standards, guidelines, regulations, by laws, codes, instructions, specifications, or administrative procedures prescribed by any lead agency either in force at the time of prescription or publication or as amended from time to time.			

PARLIAMENTARY RESEARCH SERVICES

13TH PARLIAMENT | THIRD SESSION

NATIONAL ASSEMBLY

DEPARTMENTAL COMMITTEE ON ENVIRONMENT, FORESTRY AND MINING

BILL ANALYSIS

Title of the Bill	The Environment Management and Co-ordination (Amendment) Bill, 2023.
Date of Publication	19th October 2023
Sponsor	Hon. Irene Nyakerario Mayaka

I. INTRODUCTION

1. The principal object of the Bill is to amend Section 147(2) of the Environment Management and Coordination Act, No. 8 of 1999 by inserting a new Subsection 2(ba).
2. The Subsection provides that the Regulations made by the Cabinet Secretary may *"make provisions for prohibition of the introduction, growth or maintenance of trees of eucalyptus species in and along any river, lake, sea or wetland"*
3. This is meant to remove the water-intensive eucalyptus trees from water catchment areas and thus preserve groundwater and prevent the reduction of water levels.

II. SITUATIONAL REVIEW

4. Eucalyptus trees cover about 20 million hectares in more than 90 countries around the world with major centers in Brazil (5.7 m ha), India (3.9 m ha) and China (4.5 m ha).
5. Eucalypts are widely grown in commercial plantations to produce raw material for the industry (pulp and paper, charcoal, sawn timber, wood panels) but also in small woodlots for the production of firewood and charcoal for domestic uses[1].

[1] Managing Eucalyptus plantations under global changes, https://agritrop.cirad.fr/589039/1/ID589039.pdf , retrieved on 23-06-2023

Trends - Other species.

6. In Kenya, eucalypts were introduced in 1902 to provide fuelwood for the Kenya-Uganda railway. Currently, eucalypts are used for fuelwood, timber, plywood, transmission poles, pulp, building materials, fencing posts, windbreaks and ornamentals[2].
7. Eucalypts are grown in most ecological zones in Kenya and on a variety of soils including infertile sands and heavy clays. In 2010, the total area under eucalypts in Kenya was about 100, 000 Ha distributed in **gazetted forests and land owned by large private companies, small-scale farmers and local authorities.**
8. Eucalyptus, a fast-growing tree species, has gained popularity in various industries due to its numerous uses and economic benefits. However, its rapid growth and extensive water consumption make it highly unsuitable for planting near water bodies and wetlands.
9. The impact of eucalyptus on these delicate ecosystems can be detrimental and long-lasting. Wetlands, particularly, are fragile habitats that provide essential ecological services, such as water purification and flood control. The planting of eucalyptus in such areas can disrupt these vital functions.
10. Kenya Forest Service[3] developed guidelines providing for the areas where Eucalyptus should not be planted. They include:
    i. Wetlands and marshy areas
    ii. Riparian areas.
        a) Along rivers (reserve not less than 30 meters as stipulated in the Survey Act Cap 299 of the Laws of Kenya. In addition, allow for an extra 20 meters to ensure that the trees do not adversely interfere with the water source.
        b) Areas around lakes, ponds, swamps, estuary and any other body of standing water.
    iii. Irrigated farmlands.
    iv. Areas with less than 400mm of rainfall.
    v. In farms next to water sources, planting should be minimized by inter-planting with indigenous tree species or in mosaic plantations between indigenous trees with the 19 latter occupying a greater percentage or strip planting of eucalyptus with natural vegetation.

[2] FACTS ON GROWING AND USE OF EUCALYPTUS IN KENYA, https://www.fornis.net/sites/default/files/documents/new%20eucalyptus%20final.pdf, retrieved 23-06-2023
[3] A Guide to On-Farm Eucalyptus Growing in Kenya, https://africacheck.org/sites/default/files/Eucalyptus-guidelines-Kenya-Forest-Service.pdf

11. White *et al.* (2002)[4] reported that the roots of Eucalypts penetrate deeper soil layers and can extract water from reservoirs in addition to that from rainfall.
12. Robert (2005)[5] observed that when eucalypts were cleared from the river systems, the flow of the river was restored to normal within a decade, indicating that the groundwater accumulates and springs up.

III. COMPARATIVE ANALYSIS

13. Several countries have recognized the potential harm posed by planting eucalyptus near water resources and have taken decisive action to mitigate these risks. Here are a few examples:

South Africa	**Brazil**	**Australia**
✓ South Africa has implemented regulations that restrict the planting of eucalyptus trees within specified distances from rivers, wetlands, and other sensitive areas. These measures were put in place to protect water quality, prevent invasive species encroachment, and maintain ecological integrity. ✓ The regulations vary by province, but they generally prohibit the planting of eucalyptus	✓ In Brazil, the state of **Rio Grande do Sul** banned the planting of eucalyptus trees within **1,000 meters** of water bodies in 2006. The legislation aimed to protect water resources, prevent soil erosion and preserve native vegetation in riparian areas[7].	✓ While eucalyptus trees are native to Australia, there have been instances where planting them near water bodies has been restricted or discouraged. ✓ In certain states, for example, in **New South Wales** and **Victoria**, it is illegal to plant eucalyptus trees within 100 meters and 50 meters of water bodies respectively without a permit.

[4] White, D.A., Dunin, F.X., Turner, N.C. Ward, B.H. and Galbraith, J.H. (2002). Water use by contour-planted belts of trees comprised of four Eucalyptus species. Agricultural water management 23(1-3): 133 -152.
[5] Robertson, D. (2005). South Africa water project clears water–guzzling alien plant infestation. https://www.voanews.com/a/a-13-2005-03-22-voa19-67382107/274863.html
[7] Eucalyptus Plantations and Water Quality in Brazil: A Review." Environmental Science & Policy 52 (2014): 131-139. doi:10.1016/j.envsci.2013.11.006.

trees within 100 meters of a river or wetland. In some cases, the restrictions are even more stringent. For example, in the **Western Cape Province**, it is illegal to plant eucalyptus trees within 500 meters of a river or wetland[6].		

[6] Department of Environmental Affairs, South Africa. "Eucalyptus Plantations: A Guide to Good Practice." 2010.

KENYA FORESTRY RESEARCH INSTITUTE

INPUT TO PROPOSED BILL FOR AMENDMENT OF SEC TION 42 OF THE ENVIRONMENTAL MANAGEMENT AND COORDINATION ACT

The Bill propose to amend section 42 of the EMCA 1999 to inserting subsection 1 that outlaws growing or maintaining any eucalyptus species along any river, sea or wetlands

Proposed Clause	**Response**	**Submission**
f(a) .grow or maintain any eucalyptus species along any river, lake, sea, or wetland. f(a)…could add "grow or maintain any eucalyptus species or any other potentially dangerous species such as Prosopis or other invasive species along any river, lake, sea, or wetland"	The intended clause is more specific on eucalyptus. Further, Clause 42 1, (d) is adequate: It states that: 42.(1) No person shall, without prior written approval of the Director-General given after an environmental impact assessment, in relation to a river, lake or wetland in Kenya, carry out any of the following activities – (d) introduce or plant any part of a plant specimen, whether alien or indigenous, dead or alive, in any river, lake or wetland Introduce the word ….or maintain after…. plant	1. Growing of eucalyptus need to be: a. Supported because of its Economic value b. Restricted to suitable sites c. Guided by species to site matching ecological principles and tools like JAZA Miti Apps. 2. Uprooting of Eucalyptus without suitable replacement will lead to more degradation of the riparian areas with possible invasion of invasive species 3. The planting of Eucalyptus in non-suitable sites can cured through development and enforcement of regulation on Eucalyptus growing in Kenya or planting suitable species in such sites. 4. The detailed submission is annexed

Annex 2

KENYA FORESTRY RESEARCH INSTITUTE

PROPOSED RESTRICTIONS AND GUIDELINE ON PLANTING EUCALYPTUS IN KENYA

Jason Kariuki, Stephen Omondi, Jane Njuguna, Joram Mbinga and Leonida Cherotich

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FOREWORD

The genus Eucalyptus comprises over 900 species, various hybrids and varieties. Eucalypts are native to Australia. They are the most widely cultivated forest trees in the world, covering over 20 million hectares. In Kenya, eucalypts were introduced in 1902 to provide fuelwood for the Kenya-Uganda railway. Currently, eucalypts are commercially grown for fuelwood, timber, plywood, transmission poles, pulp, building materials, fencing posts, windbreaks and ornamentals.

Eucalypts are grown in most ecological zones in Kenya on a wide range of site types and climates variety of soils including infertile sands and heavy clays. The total area under eucalypts in Kenya is about 100,000 hectares, distributed in gazetted forests, large private companies, small scale farmers and local authorities. The area under Eucalyptus is likely to increase as a result of high demand for transmission poles to cater for the ongoing expansion in rural electrification, and for construction, fuelwood, carbon sequestration and mitigation of the effects of climate change.

Since 1970s, concerns have emerged globally on the alleged harmful effects of the eucalypts on the environment and have since attracted a lot of attention from environmentalists, researchers, policy makers and politicians grew. The key eucalyptus attribute of concern is the high water use by the species and negative effects on soil fertility and biodiversity. Many countries have initiated restriction on growing of eucalypts in specific sites mostly riparian areas, wetlands and water catchments and rivers and springs.

To address these concerns in Kenya, the government in 2010 launched two publications to inform decisions on growing of eucalyptus in the country namely, "*A guide to On-Farm Growing of Eucalyptus in Kenya*", and "*Facts on Growing and Use of Eucalyptus in Kenya*". Since, then it has been found that the two publications did not sufficiently address some key issues including specifics on where growing of Eucalyptus trees should be restricted as a matter of greater public interest especially because water catchments and attendant resources are critical to other sectors and the socioeconomic development of the country. The current paper proposes restrictions on growing Eucalyptus in Kenya and will be handy in providing critical information and awareness creation on where Eucalyptus should not be planted in the country.

The booklet therefore provides descriptions of sites where growing of Eucalyptus should not be allowed to minimize its adverse effect on the environment leading to increased water flow, forest cover and conservation of biodiversity in the country.

Joshua K. Cheboiwo (PhD)
Director, Kenya Forestry Research Institute

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List of Acronyms

IUFRO	International Union Forestry Research Organizations
KEFRI	Kenya Forestry Research Institute
KFS	Kenya Forest Service
PPCSA	Presidential Commission on Soil Conservation and Afforestation
NTZC	Nyayo Tea Zones Company
FAO	Food and Agriculture Organization

1.0 Introduction

Eucalyptus is a genus of more than 900 species and is the most commonly planted genus of trees in the world (Demel 2000). The major planting of this tree species outside Australia include Kenya, Brazil, Malaysia, the Philippines and China among other countries. The major Eucalyptus growing countries are: China (4.5 million ha); India (3.9 million ha); and Brazil (5.7 million ha) (IUFRO, 2018). In Africa, South Africa has the largest area under Eucalyptus plantations of about half a million hectares (Teketay, 2003). Eucalypts grow in diverse ecological conditions with some hardy species growing in semi-arid areas, whereas others are able to grow on marshy and swampy sites. Eucalypts also grow under a variety of soils including fertile loamy soils, infertile sands and heavy clays. In East Africa Eucalyptus is grown in Ethiopia, Rwanda, Uganda, Kenya and Sudan. The total area under eucalypts in Kenya is estimated at 100 000 ha comprising: 15 000 ha in gazetted forests; 35 000 ha on private land owned by large companies; and the rest on land owned by individual farmers and local authorities in form of woodlots, ornamentals, boundary planting, avenue planting and scattered trees on communal land (KFS, 2009, Oballa *et.al* 2010). Growing of eucalypts has been expanding due to high demand for wood for renewable energy, carbon sequestration and mitigating climate change (Ball, 1995; Binkley and Stape, 2004; FAO, 2009).

1.1 Global Perceptions of Eucalyptus trees

Criticism concerning the alleged harmful effects of the eucalypts on the environment started in the 1970s attracting the attention of policy makers across the world with countries responding differently. The concerns about the adverse impacts of Eucalypts on soil, the water cycle, wildlife, biodiversity, and local vegetation have been expressed in India, Portugal, Brazil and Kenya leading to restrictions on growing Eucalyptus trees in specific landscapes such as stream banks and catchments areas.

Due to the negative concerns raised, the Food and Agriculture Organization (FAO), in 1988 commissioned several studies at global, regional and country levels (Davidson 1985; FAO 1988). In its findings FAO noted presence of three types of stakeholders: (i), eucalyptus growers, (iii), environmentalists and (iii) researchers. Eucalyptus growers overwhelmingly supported Eucalyptus trees whereas environmentalists and agriculturists vehemently opposed emphasizing the negative environmental impacts. The major arguments against Eucalyptus trees include: draining of water resources; suppression of undergrowth, Depleting of soil nutrients; induction of allelophatic effects (Davidson 1985; FAO 1988; Nduwamung et al. 2007) while the positives include provision of various economic goods and services including reduction of soil erosion.

1.2 Global Experiences on Restrictions of Eucalyptus trees

The scepticism on Eucalyptus trees has made some countries to take drastic restrictive actions including outright ban. For example in 1913, Ethiopia ordered residents of Addis Ababa to uproot half of the Eucalypts planted in their farms. India has banned growing of Eucalyptus in specific sites or regions in three (3) states. For example in 1990, the Karnataka State banned Eucalyptus and Acacia growing in areas with rainfall of 500-750mm and in 2011 changed the Forest Act and banned all public nurseries from raising Eucalyptus seedlings and finally instituted a complete ban on propagation and planting in 2017 across the state. Tree growers

responded by taking the state to court citing jurisdiction, lack of scientific data to back state claims and cited negative impacts on incomes and livelihoods of the poor. In October 2018 Portugal banned planting of Eucalyptus trees in certain areas and proposed mixed species planting in such areas. In East Africa similar concerns and proposed actions have been considered in Rwanda, Kenya, and Uganda (Jagger and Pender 2000; Nduwamung *et al.*, 2007; Oballa *et al.*, 2005).

1.3 Eucalyptus Distribution and Economic Importance

Eucalyptus species are grown in many ecological zones in the country from coastal lowlands to the highlands. The key species include, *E. grandis, E. saligna, E. globulus, E. regnans, E. paniculata, E. maculata, E. camaldulensis, E. citriodora, E. tereticornis, E. urophylla and E. hybrids*. Counties with high densities of Eucalyptus growing include Kakamega, Vihiga, Kisii and Kericho where Eucalyptus forms over 80% of the planted species on farms and private plantations. The medium growing counties include Nakuru, Uasin Gishu, Nandi, Trans Nzoia, Kiambu, Embu and Meru among others that Eucalyptus form less than 15% of the planted area but with growing fast due to high demand for firewood and transmission poles. Currently Eucalyptus products from farms and private plantations are about 450, 000 poles per annum and also produce biomass energy to tea, tobacco, lime, cement and many other industries.

2.0 Experiences on Eucalyptus Restrictions in Kenya

The country has experienced sporadic pronouncement mostly by prominent policy makers and politicians that have not been backed by adequate policy, structural and specific measures to move it into reality. Among the first voices was the Chairman of the Permanent Presidential Commission on Soil Conservation and Afforestation (PPCSCA), Mr. Zachary Anyieni who called for uprooting of Eucalyptus planted in wetlands. In 2007, the Nobel Prize laurate and renowned conservationist Prof. Wangari Maathai, called for the ban on planting alien species and particularly Eucalyptus. In 2009, the Permanent Secretary, Ministry of Agriculture, Romano Kiome proposed ban on planting of Eucalyptus in Nyayo Tea Zones in Mt Kenya. Theses pronouncements were not backed by policy and specific evidence to support them as well as structures for implementation.

In October, 2009 the Minister for Environment and Natural Resources, Hon. John Michuki ordered the uprooting of Eucalyptus trees from wetlands and banned their planting along rivers and watersheds. In same year the Ministry of Agriculture published the Farm Forestry Rules 2009 that also restricted planting of Eucalyptus in wetlands with no compliance. In 2010, two publications, "*A guide to On-Farm Growing of Eucalyptus in Kenya*" and "*Facts on Growing and Use of Eucalyptus*" were produced by the Kenya Forestry Service (KFS) and the Kenya Forestry Research Institute (KEFRI) respectively in an attempt to enforce the implement the pronouncement. Like the Farm Forestry rules 2009, the two publications were not implemented.

In February 2020 the Cabinet Secretary, Ministry for Environment and Forestry, Hon. Kerioko Tobiko during the World Wetlands Day Celebrations directed KFS to remove Eucalyptus species along Mara River catchment in Eastern Mau Forest and replace them with the indigenous bamboo.

2.1 Justifications/Rationale for the restrictions

Despite the existence of the booklets mentioned above and the Farm Forestry Rules 2009, and other rules and regulations mentioned in this policy, Eucalyptus trees have continued to be grown in the wrong sites with negative environmental impacts. Some stakeholders still express the concerns that there is no scientific information and data to sufficiently inform the public that Eucalyptus trees cause adverse effects in the environment. Therefore, the paper justifies restrictions on the following scientific grounds;

2.3 Scientific Evidence on Eucalyptus and Water Use

Evidence shows that Eucalyptus trees have the ability to lose excessive water into the environment due their ability to keep their stomata open (Gurumurthi and Rawat, 2000; 1992) when there is excess water in the environment; a condition referred to as ***luxury water consumption***. This results to high transpiration rates increased evaporation, reduced runoff and low infiltration rates (Davidson, 1995). This could be the reason why Eucalyptus trees are used to drain swamps and marshy areas and significantly affect underground water levels.

Scientific evidence and previous information, it is confirmed that eucalyptus consume large amounts of water to produce biomass compared to other tree species, reduces ground water availability and also reduce water flow resulting in drying up of streams and various water sources. Scientific evidence show that a mature eucalyptus tree can consume as much as 90 litres of water per day under excessive water availability.

Further, evidences show under unlimited water availability, Eucalyptus water requirement rises to as high as 90 litres per plant per day and that under water scarcity, their water requirement comes down to 40-50 litres per plant per day by adopting various mechanisms for drought avoidance (Kallarackal and Somen, 1997; Whitehead and Beadle, 2004). It is estableisged that eucalyptus trees generally consume more water under adequate water availability indicating that, they are reasonably drought tolerant and can efficiently adapt to various climatic conditions depending on prevailing environmental conditions.

Further research shows that, *Eucalypts are able to draw water from large area in* the vicinity of its root system. (Ravikumar Hoogar *et al*, 2019). Mukund Joshi and Palanisami (2011) demonstrated that the depth of freshly dug borehole wells was 26.3 to 47 per cent more in situations where the borehole wells were located within 1 km of Eucalyptus plantations of more than 2 hectares. Against the average depth of 177 m, the depths of freshly dug borehole wells in the vicinity of Eucalyptus plantations were in the range of 224-261 m. These studies clearly showed that eucalyptus plantations significantly reduce availability of ground water. This reduction was found to be more prominent in downstream areas of the watershed.

Studies by Scott & Lesch (1997); Albaugh *et al.,* (2013) also showed that eucalyptus plantations reduce water flow faster than pine plantations. Reduction of water flow was further reduced by increase in age of both species irrespective of the season. These studies further showed that streams completely dried in areas afforested with eucalypts by year 9, while streams near those afforested with pines dried up by 12 years after planting (Scott & Lesch, 1997; Albaugh *et al.,* 2013). The authors further showed that the annual stream

flow reduced by 47mm for pines and 239 mm for eucalypts respectively. Due to this phenomenon, it is therefore advisable that Eucalypts are not planted around wetlands and or riparian areas to maintain regular water flows.

Some studies (Senelwa *et al.*, (2009) have argued that although eucalyptus hybrids are heavy consumers of water although they produce double the biomass per litre compared to indigenous tree species, which are light consumers and produce reasonable amount of biomass per litre of water. However, it is important to note that biomass production should not be the only factor to consider since other environmental goods and services such as water quality and quantity for agricultural and domestic uses is also important for survival of humans and animals. From the evidence provided above and that in the foregoing sections, it is clear that plantations of eucalyptus exert more double pressure on water resources and therefore should not be planted near water sources.

2.3 Eucalyptus and Fires

Another lesser-known impact of Eucalyptus in Kenya is their ability to spread wildfires. It is reported that eucalyptus trees have the potential to promote serious wildfires owing to easily flammable sap, bark and easily combustible oily leaves. The bark of Eucalyptus trees easily peels off and fly off many miles thus spreading fires. Eucalyptus trees are thought to have caused the world's worst fires in California and Portugal in 2018 and in Australia in January 2020. Furthermore, research shows that Eucalyptus trees are adapted to fires since they have epicormic buds deeply covered under the bark that easily re-sprout after even after high intensity fires (Crisp *et al.,* 2011). This implies that they will quickly recover from fires and dominate the landscape unlike species that are not fire tolerant. It is reported that species of *Fraxinus* were planted around eucalyptus plantations in Kenya since they are fire tolerant. However little research has been done to prove this observation in Kenya hence the need for detailed research on the subject.

The scope of this paper restricts itself to issues surrounding Eucalyptus and water use, a commodity that is critical to the survival of life on earth.

2.4 Restrictions on planting of Eucalyptus trees

Based on the information gathered on eucalyptus and water used as provided in the revised version of "*Facts on Use and Growing of Eucalyptus in Kenya*", it is recommended Eucalyptus trees should not be planted:

- Near water sources, riparian areas, wetlands, and marshy areas, lakes, ponds, swamps, estuaries or any standing water, riparian areas especially along rivers streams, springs and irrigated farmlands and;

- A distance of 50 m from the riparian area should be left clear of all tree planting in accordance with the restrictions provided by The Survey Act cap 299 of the Laws of Kenya, that "a distance of not less than 30 m should be reserved from the riparian areas and an extra 20 m where trees are to be planted";

It is further recommended that:

- Due to allopathic and shading effects on agricultural crops, Eucalypts should not be planted along farm boundaries to avoid social conflicts.

3.0 Supporting Policy and Legislative Framework

3.1 Relevant Policy and Legal instruments on Land Use Restrictions

Currently there is no enabling policy and legislation to guide growing Eucalyptus trees except The Farm Forestry Rules 2009. The rest are guidelines or legislation to guide general conservation and protection of water courses, riparian, wetlands and water catchments that place some restriction on specific or quantum of land uses. These include:

3.1.1 The Constitution of Kenya 2010

The Constitution of Kenya 2010 (CoK 2010), under Land and Environment, articles 69 and 70 seek to eliminate processes and activities likely to endanger the environment and promote equitable management, protection and conservation of the environment. Therefore, CoK 2010 envisages a situation where critical ecosystem services like water are provided in perpetuity to the current and future generations hence elimination of adverse land uses.

3.1.2 Environmental Management and Coordination Act 1999

The Environmental Management and Coordination Act No 8 of 1999 revised 2002 and Amended in 2015 entitles every person to a clean and healthy environment and has a duty to safeguard the same. The Act demands that action should be taken to either eliminate or mitigate land use actions that are likely to have negative impacts on the environment and provision of related services.

3.1.3 Environmental Easements in EMCA 2009

The sections 112–116 provide for the creation of environmental easements to facilitate the conservation and enhancement of environmental conditions for various purposes including environmental services. It confers a legal right to conservation organizations or government agency to restrict or forbid future development on a parcel of land but may allow the owner to continue to make some use of the property. The section provides an opportunity for a negotiated temporary or permanent deferment of land uses that are injurious to provision of ecosystems services while compensating the land owner for the loss of certain uses.

3.2.2 EMCA (Water Quality) Regulations, 2006

The Environmental Management and Coordination Act (Water Quality) Regulations, 2006 provide guidelines on use and management of water sources and quality of water for domestic use, municipal supply and irrigation. The regulations prohibit anyone from undertaking development activities in areas where such development may pollute or interfere with water. The regulation objectives are aimed at improving the quantity and quality of water for various uses.

3.2.3 EMCA 2009 Regulation on Wetlands

The EMCA Regulation on wetlands, Riverbanks, Lake Shores and Sea Shore Management 2009 promote conservation and sustainable use of wetlands and water resources in Kenya. The regulations recommend the use of precautionary principal when working near wetlands in order to conserve them. Wetlands, riverbanks and lake shore are providers of key ecosystem services

and their use is highly regulated through precautionary principle that requires mitigation measures in case of development schemes.

3.3 The Lands Act, 2012

The Land Act, 2012 provides ownership rights to various entities who are in charge of specific natural resources with negotiable powers on management issues and thus tenure rights are key ingredients in formulation and implementation of Eucalyptus growing across various land categories in the country.

3.4 Water Act 2002

The Water Act and its subsequent supplementary legislations give powers to WRMA to levy on water use to support catchment conservation activities including development of catchment management plans, and rehabilitation of degraded catchments. The WRMA actions represent some form of public instruments that provide support to landowners to undertake activities that mitigate watershed degradation processes.

3.5 The Forest Conservation and Management Act, 2016

The Forest Conservation and Management Act, 2016 under article 27. (1) Establishes Forest Conservation and Management Trust Forest Fund. The objects of the Trust Fund are to nurture, promote and support innovations and best practices in forest conservation and development including support of programmes for payment for ecosystem services.

3.6 The Agriculture (Farm Forestry) Rules, 2009

The subsidiary legislation of the Agricultural Act Cap 318 whose objective and purpose is to promote the establishment and sustainable management of farm forestry for the purposes of protecting riverbanks, shorelines, riparian and wetland areas among others under section 2 outlines that no agricultural landowner or occupier shall grow or maintain any Eucalyptus species in wetlands and riparian areas.

3.7. The Survey Act Cap 299

The Survey Act Cap 299 of the Laws of Kenya that stipulates "a distance of not less than 30 m should be reserved from the riparian areas" and an extra 20 m where trees are to be planted giving a total distance of 50 m from a riparian area.

4.0 Proposed Way Forward on the Implementation of the Restrictions on Growing Eucalyptus Trees

4.1 Mapping of restriction areas in the country

The national and county governments in collaboration with partners will be required to map out the restricted areas within counties for purposes of education, compliance and implementation of the restrictions. The specification for rivers and riparian areas are also contained in section… of this policy. The process should be consultative to enable buy in by landowners and remove ambiguity and contestation on the specifics of the restrictions.

4.2 Restriction Order and Procedures

The quantum of legislations outlined in section 3 and section 2.2 of this paper provide sufficient grounds for restriction of Eucalyptus planting in fragile areas for purposes of public good

mostly to ensure sustainable flow of water and goods and services for socioeconomic development.

Therefore, landowners bordering wetlands and marshy areas, riparian areas, around lakes, ponds, swamps, estuary, sea shores and any other body of standing water, irrigated farm lands and areas with less than 400mm of rainfall are prohibited from planting or mainatining Eucalyptus with specified distances as provided in the various laws. They should leave a clear 50 m from the riparian areas of the bodies mentioned in this paragraph.

All landowners both public and private should take note and comply with these restrictions.

4.3 Procedures for Removal from Restricted Areas

The landowners who have planted Eucalyptus species within the restricted areas are required to remove them within agreed/negotiated timelines as provided in the Agricultural Act 318 Forestry Rules 2009. Part II section 6 subsection (1, 2, 4 & 5) and section 7 subsections (1, 2, 3, 4, 5, 6, 7 & 8) provide procedures on compliance within 30 days of notice, consultative process and appeal procedures thereon.

4.4 Replacement with Water /Riparian Friendly Species

The Agricultural Act Cap 318; Farm Forestry Rules 2009 section 6 allows planting of tree species or varieties that don't have adverse effects on water sources. The Ministry of Environment and Forestry will provide a comprehensive list of species suited for planting in wetlands and marshy areas, riparian areas, around lakes, ponds, swamps, estuary, seashores and any other body of standing water, irrigated farmlands and areas with less than 400mm of rainfall. The list will be used by public and private agencies to advice farmers on preferred species for fragile ecosystems and for public good. Some of the species are listed in annex 1.

4.5 Public Awareness on the Restrictions

To ensure compliance and concurrences among landowners, national and county government agencies the Ministry of Environment and Forestry in consultation with national and county government agencies will mount rigorous campaign to educate the public on conservation of fragile ecosystems and areas of public interest. Standard brochures and pamphlet with standard messages will be prepared and shared for purposes of synergy and content to minimize any contradictions.

4.6 Structured engagement with stakeholders

All stakeholders with interest on land and conservation of the environment will be engaged through various forums at both national and county levels.

4.7 Radio and TV adverts and Education

The key national and government agencies and other conservations institutions will be required to engage the public through radio talks and TV sessions among others forums to sensitize and educate the public on Eucalyptus restriction areas and remedial actions

4.8 Grassroots mobilization and coordination

The national and county government grassroots actors including chiefs, sub chiefs, ward administrators and civic organizations will provide with standard brochures and pamphlet will education and order messages for use in local education forums.

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ANNEX 1

KENYA FORESTRY RESEARCH INSTITUTE

Evidence-based Technical Response to the Discussion on EMCA 1999 additional Clause on "Grow or Maintain Any Eucalyptus Species Along Any River, Lake, Sea, Or Wetland"

By

The Director
Kenya Forestry Research Institute

March 2024

1. Background

This brief looks at the controversy surrounding the impact of *Eucalyptus* tree species on Kenya's water resources and agricultural land. It specifically looks at:

a) Kenya's commercial timber market outlook
b) The place of *Eucalyptus* as an alternative source of timber in Kenya
c) Economic significance of Eucalyptus trees to Kenya's economy
d) Potential ecological and environmental risks and recommended mitigation measures

2. Kenya's commercial timber market outlook

The demand for wood and wood products, particularly sawn timber, transmission poles, fencing posts and fuelwood, has been rising rapidly with increase in Kenya's population and economic growth. Currently, the country can only meet 70% of its timber demand (about 49 million m^3 of wood) through domestic supply. The rest is met through imports, which also struggle to bridge the gap. The import market targets mainly sawn timber for construction work (roofing & fittings – 69%) and furniture production (28%), a market segment that remains grossly undersupplied. The situation has seen the government zero rate timber imports for close to a decade with little success in terms of bridging the supply gap. The country's annual timber supply deficit is projected to broaden with an estimated collective growth demand of 6.2% per annum with growth in urbanisation and increase in demand for affordable housing and associated interior fittings and furnishing. It is estimated that the demand will increase to 66 million m^3 by 2030, while supply will stay largely static. This will widen the supply deficit to approximately 63%.

The greatest constraint to meeting the timber demand in the Kenya is that the industry relies mainly on gazetted government plantation forests, which make up only 6.5% of the total forest area. Private landowners have not found much incentive in establishing industrial plantation forests because of the long rotational period of key plantation forest tree species (25 years for Cypress and 30 years for Pine). As a shortcut, farmers have always grown substitutes, particularly *Eucalyptus* and *Grevillea*, which mature in 10 to 15 years. In most cases, the price for these substitutes is much lower when saw millers factor in the cost of transporting unprocessed roundwood from farmlands to milling plants. With a negligible number of private investors producing industrial forest tree species on a commercial scale currently, the timber deficit cannot be bridged in the next twenty five years even if massive tree planting was to commence today. In this regard, the country will continue to rely on *Eucalyptus* tree species produced by small-scale farmers.

3. The place of *Eucalyptus* as an alternative source of timber in Kenya

Eucalyptus is the tree species with the largest acreage in Kenya, and this is because of its desirable attributes, such as fast growth, multiple uses, suitability to diverse agro-ecological zones small and overall appeal to key sectors of the economy such as manufacturing, construction and energy. In 2006, the area under *Eucalyptus* trees in Kenya was estimated at 100,000 ha. This comprised 15,000 ha in gazetted forests, 35,000 ha in commercial forest estates (e.g., tea estates) and 50,000 ha in small-scale farms. Current estimates place its coverage at 250,000 ha (Kluthe, 2016), with the acreage under small-scale farms comprising approximately 200,000 ha.

The tree species was introduced into Kenya in 1902, primarily to provide fuel wood for the locomotive engine. Kenya's indigenous forests were at risk of depletion with the arrival of the Kenya-Uganda Railway. Later, it became an affordable source of energy for the tea and tobacco industry. Approximately 100 *Eucalyptus* species were introduced into the country, of which 83 are planted at the KEFRI Arboretum in Muguga. Ten of the species ended up being widely planted on-farm. These include *E. grandis, E. saligna, E. globulus, E regnans, E. paniculata, E. maculata, E camaldulensis, E. citriodora, E. tereticornis, E urophylla* and hybrids. The trees are found in a variety of ecological settings throughout Kenya. Considering the area under *Eucalyptus* trees currently and the various value chains that it supports, it is reasonable to state that it is the most import tree species currently in Kenya's forestry sector.

4. Economic significance of Eucalyptus trees to Kenya's economy

Eucalyptus trees are very important to Kenya's economy. They are grown primarily for construction materials, utility poles and the production of tea leaves and tobacco. At an average of 1,600 trees per acre and a tree survival rate of 80% at Year 10 and a market rate of KES 2,000 per tree, a farmer is likely to make KES 2,560,000 per ha. Thus, the conservative market value of 250,000 ha of *Eucalyptus* trees in Kenya is KES 640 billion if harvested after ten years or KES 64 billion per year if calculated on an annual basis. This translates to approximately 0.41% of the GDP.

Some attributes of Eucalyptus trees that make popular among Kenyan farmers include:

a) Eucalyptus trees are fast-growing and can be harvested for their wood, bark, and leaves in a relatively short period of time.
b) Eucalyptus trees are relatively easy to grow and require little care.
c) Eucalyptus trees are drought-tolerant, which makes them a good choice for farmers in Kenya who live in areas with low rainfall.
d) The demand for eucalyptus products is growing rapidly.

The market for eucalyptus trees in Kenya is expected to continue to grow rapidly in the coming years. Some of the major buyers of eucalyptus trees in Kenya include:

i. Timsales
ii. Sawmills
iii. Furniture manufacturers
iv. Paper mills
v. Timber Yards
vi. Charcoal producers
vii. Kenya Power and Lighting Company (KPLC)
viii. Rural Electrification Authority (REA)

5. The Distribution of Eucalyptus trees in Kenya

Eucalypts are grown in agro-climatic zones II, III and IV. The major Eucalyptus growing areas in Kenya include Western Region, Central Rift Valley, Central Kenya, parts of Eastern and the Coastal regions (Figure 1).

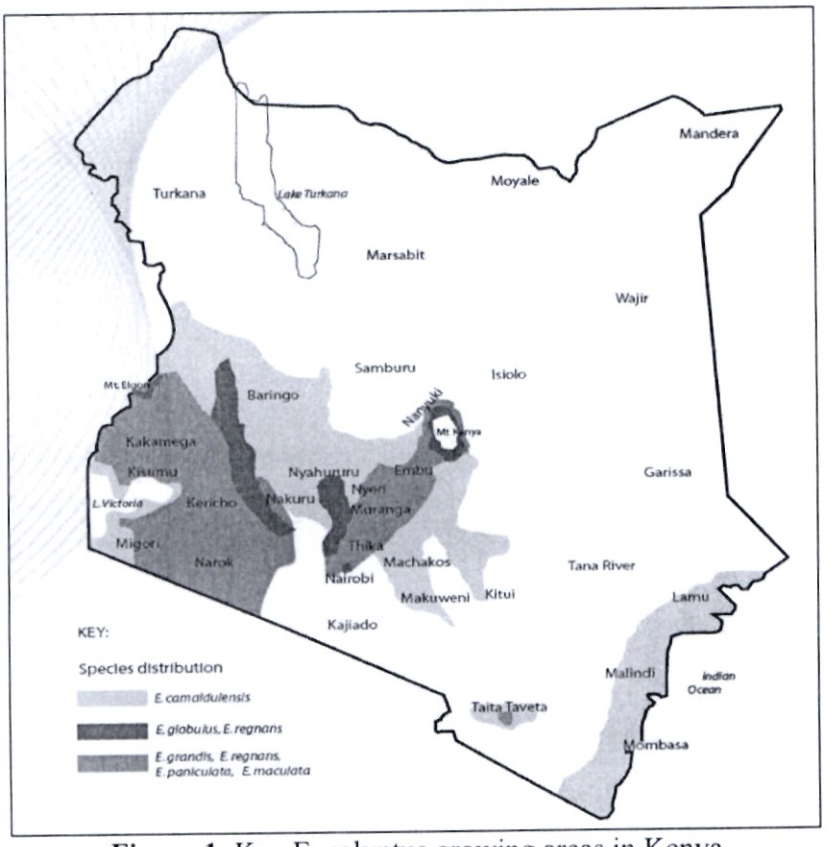

Figure 1: Key Eucalyptus growing areas in Kenya

Although the genus Eucalyptus is spread across diverse ecological conditions, various species thrive under different altitude and rainfall regimes. The recommended areas for growing various Eucalyptus species in Kenya are shown in Table 1.

Table 1. Recommended areas for growing Eucalyptus species in Kenya

Species	Altitude (m)	Minimum annual rainfall (mm)	Recommended areas for planting
E. grandis	1400-2200	1000	Greater districts of Bungoma, Kakamega, Trans Nzoia, Uasin Gishu, Nandi, Kericho, Kisii, Nyeri, Kiambu
E. saligna	1600-2500		
E. globulus	2000-3000	1000	Molo, Nyandarua
E. regnans	2500-3000	1000	South Kinangop, Molo, Timboroa, Londiani
E. paniculata	1600-2000	1000	Nairobi, Nakuru, Nanyuki
E. maculata			Nyeri, Nairobi, Nakuru, Nanyuki
E. camaldulensis	Up to1400	600	Dry areas of Nyanza, Coast, semi-arid lowlands
E. citriodora	1200-2000	1000	Lower areas of Nyanza, Nakuru, Nyeri, Nanyuki
E. urophylla	Up to1400	1000	Coast, Meru, Lower Nyanza
Eucalyptus hybrids	Up to1700	750	Coast, Lower Nyanza, Mid-Eastern, Lower Western

6. Propagation of Eucalyptus

Eucalyptus species are propagated from seed and through vegetative means. Planting material is collected from trees with superior characteristics; tall, good form, little taper and healthy. The most commonly used method for vegetative propagation of Eucalyptus in Kenya is cuttings. Other methods used to a limited scale in Kenya are grafting and tissue culture. The vegetatively propagated materials are called clones because they are duplicate genetic copies of the original individuals. Eucalyptus species that are raised through vegetative methods include; *E. grandis*, *E. saligna*, *E. camaldulensis* and *E. urophylla*, and their hybrids. Hybrids can only be raised through vegetative methods, widely known as cloning. Tree growers are advised not to use seeds of hybrid clones to raise seedlings for planting. Seeds from clones will not produce the same material as the parent.

6.1 Spacing of Eucalyptus in the field

Initial spacing depends on the objective of planting the eucalypts (KFD, 1996; KFS, 2009). In plantations for production of transmission poles and timber, the spacing is 3 x 3 m, fuelwood and pulpwood is 2 x 2 m, and for withes and firewood for domestic use 1 x 1 m (Table 2).

Table 2. Recommended spacing and stocking of Eucalyptus plantations in Kenya

Objective of planting	Initial spacing (m)	Trees per hectare
Withies, domestic firewood	1.0 x 1.0	10 000
Fuelwood, pulpwood	2.0 x 2.0	2500
Fuelwood, light construction poles, pulpwood	2.5 x 2.5	1600
Transmission poles, fencing posts, light construction poles, timber	2.75 x 2.75	1320
Transmission poles, fencing posts, construction wood, timber, plywood	3.0 x 3.0	1100

6.2 Growth and yield

Eucalypts are highly productive provided that care is taken to match the species/provenance to the right locality, and appropriate site preparation and establishment procedures are duly followed. Annual production rates in Kenya now range from 20 m^3 ha^{-1} to over 70 m^3 ha^{-1} depending on the species, site quality, management, and climatic conditions (Oballa and Giathi, 1996). At Muguga and Turbo, KEFRI has recorded annual volume growth of 70m^3 ha^{-1} and mean annual height increment of 5 m for improved *E. grandis* (Oballa, 1989; Oballa and Giathi, 1996), and 3 to 4 m for *E. camaldulensis*, *E. regnans* and *E. globulus* at the age of 3 to 4 years (Konuche, 1989; Maua, 1997). Such high rates of productivity are only sustainable with investments on silviculture and tree breeding research.

There are differences in growth between hybrid clones and local landraces at various sites. *Eucalyptus grandis* x *E. camaldulensis* (GCs) 10, 14, 15, 522, 540, 581, 642 and *E. grandis* x *E. urophyla* (GU) 21 perform better in marginal agricultural areas, whereas *E. grandis* is superior in high potential areas (Wamalwa *et al.*, 2007). There are also differences in performance among hybrids at various sites indicating that some hybrid clones are more adaptable to specific sites (Kirongo and Muchiri, 2009). Hybrid clones GCs 581, 14 and 15 have good growth across most sites.

7. Evaluating Eucalyptus enterprise for profitability

Some of the factors that are considered when evaluating Eucalyptus enterprises for profitability include net present value (NPV), equal annual equivalent (EAE) and land expectation value (LEV). NPV is the present value of all benefits (revenue) less the cost. EAE is an annual payment that will pay off the NPV of an asset during its lifetime and LEV is the capitalized value of the expected annual net income.

Results of a study at the Kenya coast in 2010 estimated the compounded cost (at 10 % per year) of a 5 year old 1 ha of Eucalyptus clones plantation with the initial stocking of 2,500 trees as Ksh. 294 000 over a period of 8 years. The total present value of the same plantation was calculated as Ksh. 666 000, resulting in a net profit of Ksh. 372 000, which is equivalent to an

annual income of Ksh. 74 400. The results of the same study showed that it is more profitable to grow Eucalyptus for production of fuelwood and poles than maize in high potential agricultural areas like Kitale and Uasin Gishu. At Kericho, it was shown that it is slightly more profitable to grow tea than Eucalyptus for fuelwood, but not for transmission poles (Figure 2). The estimated volume of wood that can be produced under various site conditions from ages 5 to 8 years for *E. grandis* varies from 75 to 360 m3 ha^{-1}.

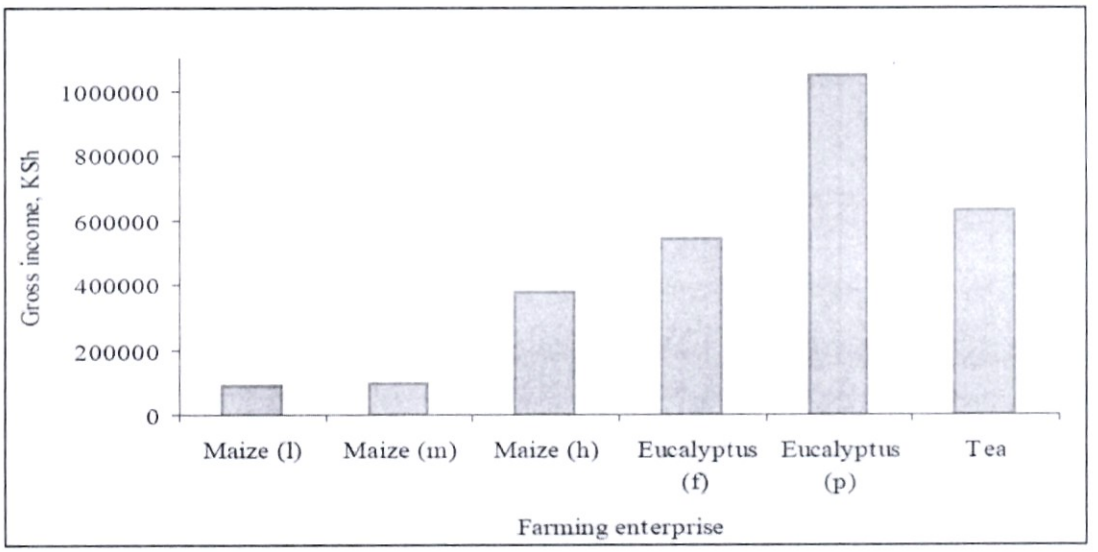

Figure 2: Net income of growing Eucalyptus, maize and tea for 8 years (l = low potential, m = medium potential, h = high potential, f = fuelwood and p = pulp wood) as at 2010

8. Pests and diseases

In Kenya, Eucalypts have been cultivated with few reported major outbreaks of pests or diseases. The earliest known pests in the country are the snout beetle (*Gonipterus scutellatus*) and termites. *Leptocybe invasa* (Blue gum chalcid) is another pest that has attacked eucalypts in the country since 2002 (Mutitu *et al.*, 2008). Snout beetle has had a devastating effect on *E. globulus* thus leading to reduced planting of the species. Recently, the pest has been observed on other species including; *E. saligna*, *E. grandis*, *E. camaldulensis* and a number of introduced Eucalyptus hybrids, but the effect is manageable. Termites are the most widespread pests attacking most Eucalyptus species in Kenya particularly in dry areas. Termites can be controlled through application of various termiticides including Regent 3G (Fipronil) at a rate of 33 g per tree at planting (Otieno *et al.*, 2009).

Attack of Eucalyptus by *L. invasa* (Blue gum chalcid) is more severe in dry areas of Western, Nyanza, Rift Valley, Coast, Central and Eastern regions of Kenya. The pest mostly attacks seedlings and saplings under 4 years. The most highly susceptible species are *E. grandis*, *E. saligna*, *E. camaldulensis* and their hybrids. Botryosphaeria is the most widespread disease of

Eucalyptus in Kenya (Mutitu *et al.*, 2008; Otieno *et al.*, 2009). It causes cankers, gum production and growth retardation.

The disease attacks *E. grandis* and its hybrids. The other diseases recorded on Eucalyptus include Mycosphaerella, which appears as black and brown spots on leaves. *Mycosphaerella keniensis* is the most widespread disease found on *E. grandis*, *E. urophylla* and *E. camaldulensis*. Powdery mildews have been observed on leaves of Eucalyptus seedlings, especially in the nursery. The affected leaves have a whitish coating and in severe cases the leaves curl. The remedy is to spray the seedlings with ridomil or milraz. Other diseases that affect Eucalyptus in Kenya include *Phytophthora* and *Cylindrocladium* species. The fungi attack the roots causing rotting. The *Cylindrocladium* species is also associated with cankers on young seedlings. The diseases are more pronounced in sites with high humidity.

9. Environmental concerns regarding planting of Eucalyptus trees in Kenya

There have been serious claims against Eucalyptus trees regarding: (i) high rate of water use, (ii) unsuitability for planting in water catchments and riparian zones, (iii) negative interactions with crops and native tree species, and (iv) a general adverse impact on agricultural (Otieno 1998; Belnap et al. 2012; Kluthe, 2016). In this regard, the defunct Permanent Presidential Commission on Soil Conservation and Afforestation (PPCSA) discouraged planting of Eucalyptus. This campaign resulted in reduced planting of the species in state forests. Currently, there is a bill in the National Assembly seeking its total ban from planting in Kenya. This section provides an impartial, evidence-based review of the species' interaction with its environment.

9.1 Scientific Evidence on Eucalyptus and Water Use

Evidence shows that Eucalyptus trees have the ability to lose excessive water into the environment due their ability to keep their stomata open (Gurumurthi and Rawat, 2000; 1992) when there is excess water in the environment; a condition referred to as ***luxury water consumption***. This results to high transpiration rates increased evaporation, reduced runoff and low infiltration rates (Davidson, 1995). This could be the reason why Eucalyptus trees are used to drain swamps and marshy areas and significantly affect underground water levels.

Scientific evidence and previous information, it is confirmed that eucalyptus consume large amounts of water to produce biomass compared to other tree species, reduces ground water availability and also reduce water flow resulting in drying up of streams and various water sources. Scientific evidence show that a mature eucalyptus tree can consume as much as 90 litres of water per day under excessive water availability.

Further, evidences show under unlimited water availability, Eucalyptus water requirement rises to as high as 90 litres per plant per day and that under water scarcity, their water requirement comes down to 40-50 litres per plant per day by adopting various mechanisms for drought avoidance (Kallarackal and Somen, 1997; Whitehead and Beadle, 2004). Generally,there is evidence that eucalyptus trees can consume more water under adequate water availability

indicating that, they are reasonably drought tolerant and can efficiently adapt to various climatic conditions depending on prevailing environmental conditions.

Further research shows that, *Eucalypts are able to draw water from large area in* the vicinity of its root system. (Ravikumar Hoogar *et al*, 2019). Mukund Joshi and Palanisami (2011) demonstrated that the depth of freshly dug borehole wells was 26.3 to 47 per cent more in situations where the borehole wells were located within 1 km of Eucalyptus plantations of more than 2 hectares. Against the average depth of 177 m, the depths of freshly dug borehole wells in the vicinity of Eucalyptus plantations were in the range of 224-261 m. These studies clearly showed that eucalyptus plantations significantly reduces availability of ground water. This reduction was found to be more prominent in downstream areas of the watershed.

Studies by Scott & Lesch (1997); Albaugh *et al.,* (2013) also showed that eucalyptus plantations reduce water flow faster than pine plantations. Reduction of water flow was further reduced by increase in age of both species irrespective of the season. These studies further showed that streams completely dried in areas afforested with eucalypts by year 9, while streams near those afforested with pines dried up by 12 years after planting (Scott & Lesch, 1997; Albaugh *et al.,* 2013). The authors further showed that the annual stream flow reduced by 47mm for pines and 239 mm for eucalypts respectively. Due to this phenomenon, it is therefore advisable that Eucalypts are not planted around wetlands and or riparian areas to maintain regular water flows.

However some studies (Senelwa *et al*., (2009) have argued that although eucalyptus hybrids are heavy consumers of water, they produce double the biomass per litre compared to indigenous tree species, which are light consumers and produce reasonable amount of biomass per litre of water. However, it is important to note that biomass production should be considered together with need for other environmental goods and services such as water quality and quantity for agricultural and domestic uses which is also important for survival of humans and animals. From the evidence provided above, it is clear that plantations of eucalyptus exert double pressure on water resources and therefore should not be planted near water sources.

9.3 Site suitability matching for Eucalyptus trees

Both KEFRI (2010) and KFS (2009) have provided information regarding areas where Eucalyptus trees should NOT be planted due to environmental concerns. These include:

i. *Wetlands and marshy areas*

ii. Riparian areas

- *Along rivers – It is stipulated that not less than 30 meters be reserved in the Survey Act Cap 299 of the Laws of Kenya. In addition, land owners should allow for an extra 20 meters to ensure that the trees do not adversely interfere with the water source.*

- *Areas around lakes, ponds, swamps, estuary and any other body of standing water.*

iii. Irrigated farm lands.

iv. Areas with less than 400mm of annual rainfall.

v. In farms next to water sources, planting should be minimized by inter-planting with indigenous tree species or in mosaic plantations between indigenous trees, with the latter occupying a greater percentage, or strip planting of Eucalyptus with natural vegetation.

9.4 Eucalyptus rooting depth and effect on ground water

There are concerns that *Eucalyptus* trees can extend their roots into deep soil layers and deplete groundwater in the process, particularly in water catchments. Eucalyptus trees have both a tap root and lateral roots. It is the tap root that extends deep in the soil. Some of the published research on this aspect include:

- Dye (1996), Robinson et al. (2006) and Christina et al. (2011) documented that the roots of Eucalyptus trees extend several metres into the soil.
- Christina et al. (2017) illustrated that Eucalyptus roots can reach a depth of 20 m within 5–7 years. However, water withdrawn from depths of over 10 m amount to only 5% of the water used by the tree. This is because a significant amount of the water is captured by its lateral roots. However, the percentage of water drawn by the tap root increases significantly during dry periods when most of the water used by the tree comes from the deeper soil layers. The situation often contributes to the lowering of the water table.
- This phenomenon is not unique to Eucalyptus trees. Most exotic trees, with a high rate of growth and little support for native underground tend to have the same effect on ground water.
- This is the reason Eucalyptus trees are not recommended for *wetlands, marshy areas, springs, river banks and other riparian zones*

9.5 Does the water table recover after harvesting Eucalyptus trees from a riparian zone?

Whereas it is generally agreed that planting Eucalyptus trees in wetlands lowers the water table (and may end up draining swamps and springs), public opinion is divided whether to remove such trees from riparian zones immediately or upon maturity. This decision should be guided by facts surrounding the ability of the water table in riparian zones to recover upon the removal of Eucalyptus trees. This section summarises research findings on the ability of a water table to recover upon removal of Eucalyptus trees.

- Lara *et al.*, (2021) assessed catchment streamflow response to the removal of a 14 year-old stand of Eucalyptus plantation and subsequent restoration of the site with suitable native tree species. Their results indicated that annual streamflow increased by between 40% in the early stages of restoration, and 100% in later stages of restoration. Overall, their findings illustrated that the removal of Eucalyptus plantations from a riparian zone immediately increases streamflow, while native forest restoration gradually restores deep soil moisture reservoirs which sustain streamflow by recharging the water table.
- In a study by Christina *et al.* (2017) on the effect of rooting depth of Eucalyptus trees on the water table, the tree roots reached the water table at 10 m below ground and the water

table fell to 12 m after 2 years, and subsequently 18m at 5 years. The Eucalyptus trees were harvested at Year 5. Two years after clear-felling the Eucalyptus plantation, the water table rose from 18 m below the ground to 12m below the ground.

- These results demonstrate that the water table often recovers when Eucalyptus trees are removed from a site.
- Thus, it is prudent to allow existing Eucalyptus trees to attain maturity or have an agreeable cut-off date for the removal of the trees so that policy and legal directives do not disrupt farmer's plans.

9.6 Effects of *Eucalyptus* on soil fertility

Few studies have been done on soil nutrient status in Eucalyptus plantations in Kenya. In 1993, a study was carried out in Ethiopia to compare nutrient status in plantations of *E. globulus* at 40 years old, Cypress at 28 and 40 years old, and Cedar at 40 years (Teketay, 2003). The results showed that soils under *E. globulus* plantations had lower nutrient content than soils under cedar trees and natural forests. The soils under *E. globulus* and cypress also tended to have lower density of mycorrhiza fungi. In natural forest, the total annual litter fall was about twice as high as in plantations of *E. globulus*. However, nutrient release in *E. globulus* plantation was comparable to that in natural forest. Overall, these studies suggest that *Eucalyptus* trees lead to a significant reduction in soil nutrient status.

9.7 Allelopathy of Eucalyptus

One of the criticisms of Eucalyptus is its allelopathic effect on other plants (Sasikumar *et al.*, 2001). This is to imply Eucalyptus produces foliar and root exudates that hinder the growth of other plants. Thus, agricultural crops planted next to a mature Eucalyptus stand may be affected by allelopathic reactions Eucalyptus. An alternative argument has been that agricultural crops do not perform well for many years in land where Eucalyptus have been harvested. Florence (2004), in a review concluded that there is no scientific evidence that eucalypts competes directly with other plants through chemical exudes. The review argues that it is appropriate to interpret any effects of Eucalypt in terms of its capacity to compete for soil resources, i.e. nutrient and water in short supply. In an experiment in which soil from Eucalyptus plantation was used in a greenhouse to grow beans, no allelopathic effects were detected (Couto and Betters, 1995). In a trial on various clones of tea grown on sites that had been prepared after removal of tea, Eucalyptus and natural forest showed that tea yield was highest on land previously under Eucalyptus (Onsando, 2001). At Muguga, the practice is to manage fuelwood plantations for four rotations that take a total of nearly 30 years (Dyson, 1974; Kaumi, 1983). Once the final harvest is done the fields are used for cultivation of agricultural crops for 1 to 2 years (Figure 7). The observation from such farms is that the yields of maize, beans or potatoes are usually higher than in the nearby cultivated farmlands, a confirmation that Eucalyptus return a good amount of nutrient to the soil and allelopathic effect is not a hindrance to crop production once the trees are clear felled.

Furthermore, a rehabilitation plot of mixed indigenous tree species at Muguga, planted in a site after 60 years of Eucalyptus growing showed no growth inhibition as a result of allelopathic residue effects. The seedlings survival and tree growth was good and by 15 years the tree

canopies had closed, with leading trees at 20 m and crown stratification beginning to form. Allelopathic effects have mainly been confirmed in high concentrates of extracts from Eucalyptus tissues (Sasikumar *et al.*, 2001) or immature compost of Eucalyptus litter (Teshome, 2009). However, given ample time, the leachetes of Eucalyptus and organic compost lead to soil enrichment. Planting of Eucalyptus with other species (mixed species trials) has been shown to hasten that decomposition of the litter and enrichment of soil.

9.8 Conflicts over planting Eucalyptus in common boundaries

The concern about the effect of Eucalyptus trees when planted long common boundaries in real. In this regard guidelines have been develop to provide direction on this. KFS (2009) on page 19 of its Guide to On-Farm Eucalyptus Growing in Kenya, states as follow:

- *While planting Eucalyptus on farm and along road reserves, ensure that the trees are planted at least six (6) meters from the boundary. In view of this requirement, planting of Eucalyptus in land sizes of less than quarter (1/4) of an Acre is not recommended. Planting, near buildings is not recommended as branches/stems of some trees break off easily.*

9.9 Effects of Eucalyptus on biodiversity conservation

Several studies have been carried out to assess the effects of Eucalyptus plantations on biodiversity. At Muguga, plant diversity was assessed in two *E. saligna* plantations. There were about 7 times more plant species in the older plantation than in the younger one indicating that species richness increases with the age of the plantation. It is also evident that the lower the stocking, the higher the biodiversity of undergrowth plant species. Further studies showed that there were 26% and 68% of woody species in the younger and older plantations respectively. Observations in other parts of the country have also shown that at low stocking level or in high rainfall areas, regeneration of a wide range of indigenous plant species is found under plantations of eucalypts. Some valuable tree species that regenerate easily under eucalyptus plantations include; *Prunus africana*, *Polyscias fulva*, *Zanthoxylum gillettii*, *Juniperus procera*, *Croton macrostachyus*, *Carissa spinarum* (*Carissa edulis*) and *Olea* species, among many other lower plant species.

Binkley and Stape (2004) confirmed that large areas of Eucalyptus plantations have the potential to alter the diversity of plant and animal species but that varies based on the surrounding landscape, type of forest (savanna or natural forest), weather, agricultural status and the management regime. For example, plantation forests in Brazil as a rule must retain at least 20% of the land under indigenous forests to provide seed bank. The results further indicate that some trials with mixed species have shown increased benefits. Mixed stands that contain nitrogen-fixing tree species may increase stand growth depending on site conditions. Eucalyptus plantations with low stocking and open canopy create conditions favourable for regeneration of other plant species and therefore enhance biodiversity conservation. However, this is better enhanced in plantations close to indigenous forests where seed is easily dispersed by wind and animals into the Eucalyptus plantations.

9.10 Eucalyptus and Fires

Another lesser-known impact of Eucalyptus in Kenya is their ability to spread wild fires. It is reported that eucalyptus trees have the potential to promote serious wildfires owing to easily flammable sap, bark and easily combustible oily leaves. The bark of Eucalyptus trees easily peel off and fly off many miles thus spreading fires. Eucalyptus trees are thought to have caused the world's worst fires in California and Portugal in 2018 and in Australia in January 2020. Furthermore, research shows that Eucalyptus trees are adapted to fires since they have epicormic buds deeply covered under the bark that easily re-sprout after even after high intensity fires (Crisp *et al.,* 2011). This implies that they will quickly recover from fires and dominate the landscape unlike species that are not fire tolerant. It is reported that species of *Fraxinus* were planted around eucalyptus plantations in Kenya since they are fire tolerant. However little research has been done to prove this observation hence the need for detailed research on the subject.

The scope of this write up restricts itself to issues surrounding Eucalyptus and water use, a commodity that is critical to the survival of life on earth.

10. Conclusion and recommendations

a) Eucalypts provide multiple benefits ranging from industrial wood, poles, timber, fuelwood, bee forage, essential oils and many environmental services such as windbreaks, erosion control, buffer to natural forests, flood control and climate change mitigation..
b) Different Eucalyptus species are adapted to different ecological zones in Kenya. Planting these eucalypts in the appropriate ecological sites is important to maximize on yields, while reducing negative environmental impacts.
c) Fast growth and high biomass yield of Eucalyptus require a high level of water consumption that must be balanced with other competing water uses such as agriculture and domestic needs. Planting of Eucalyptus species should therefore be restricted to sites recommended by the policy guidelines.
d) When Eucalyptus is grown on short rotation, soil nutrient removal is high. Management systems should therefore include soil nutrient replenishment through application of fertilizers. For long rotations (12 years and above) nutrient recycling is similar to that of natural forest where decaying debris return minerals to enrich the soil.
e) Mixing Eucalyptus with other tree species can enrich productivity in plantations, as these species hasten decomposition of litter, leading to soil enrichment.
f) Biodiversity within Eucalyptus plantations is high in low-density plantations of over 15 years of age.

Recommendations

1) It is advisable to choose the right species of eucalyptus for your area. There are many different species of eucalyptus trees, and each one has different characteristics. You need to choose a species that is suited to the climate and soil conditions in an area.

2) It is advisable to ensure quality source of seed for your trees. There are many different companies that sell eucalyptus seedlings. You need to find a company that has a good reputation and that sells high-quality seedlings.

3) Plant seedlings at the right time of the year. Eucalyptus trees should be planted during the rainy season.

4) When planting Eucalyptus on farm and along road reserves, ensure that the trees are planted at least six (6) meters from the boundary. In view of this requirement, planting of Eucalyptus in land sizes of less than quarter (1/4) of an Acre is not recommended. Planting, near buildings is not recommended as branches/stems of some trees break off easily
5) Thus, it is prudent to allow existing Eucalyptus trees to attain maturity or have an agreeable cut-off date for the removal of the trees so that policy and legal directives do not disrupt a farmer's plans.

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Reviving our Water Sources

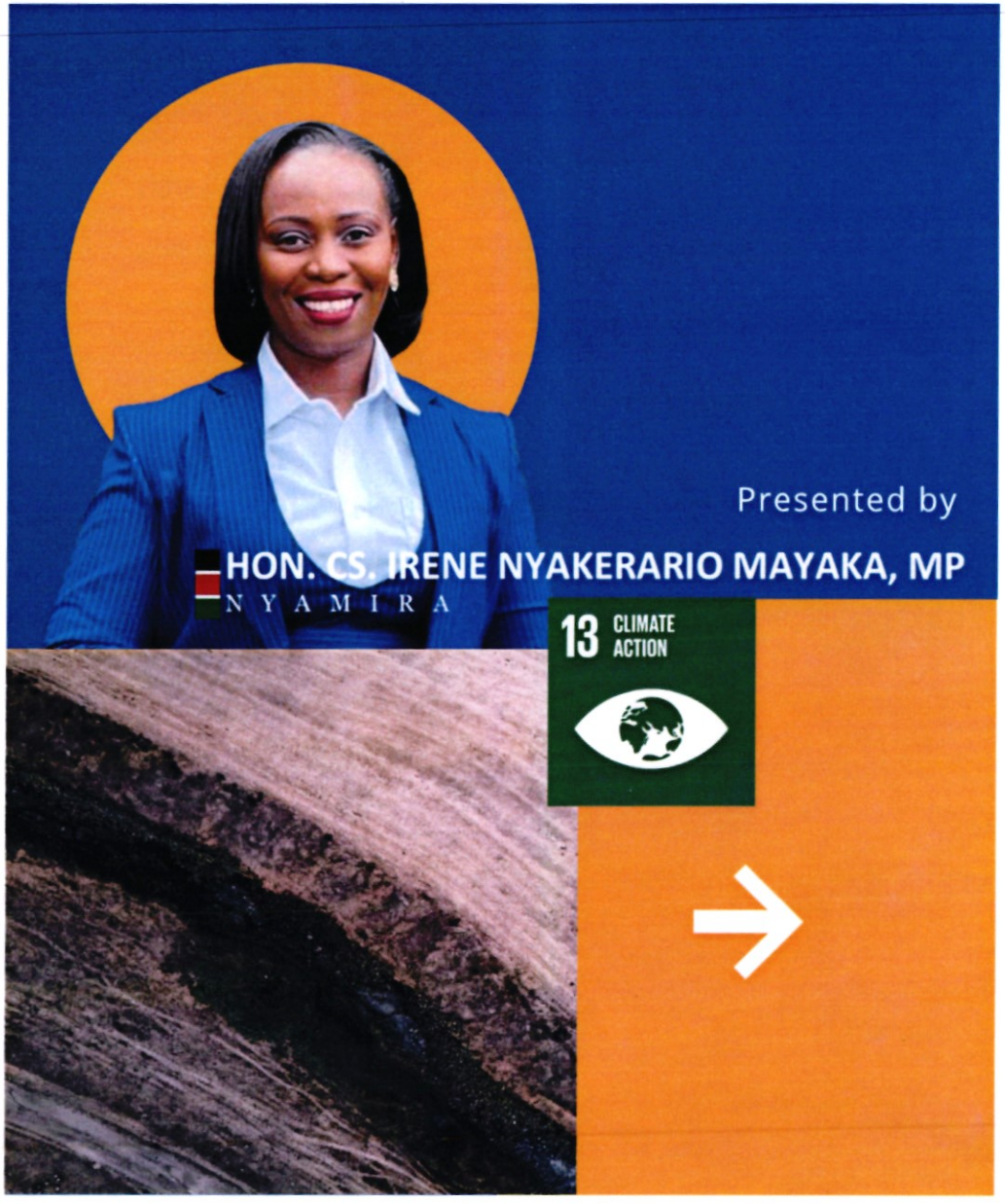
Prepared for the

Environment Committee

Kenya National Assembly

Assigned Theme:

Solving my Community's & Nation's Negative Contributions to Climate Change



Situation Analysis

Let's face it. There is a growing crisis around ensuring water security for our ecologies, power generation needs, and for our daily sustenance.

Our major water towers, Mau Forest Complex, Mt. Kenya, Aberdare ranges, Cherangany Hills and Mt. Elgon, feed into key catchment areas through many rivers across our country that are currently under threat of extinction.

Sadly this extinction of our rivers - even though effected mainly by climate change - has man-made contributions, due to a culture we introduced of planting water intensive crops along the banks of our water bodies.

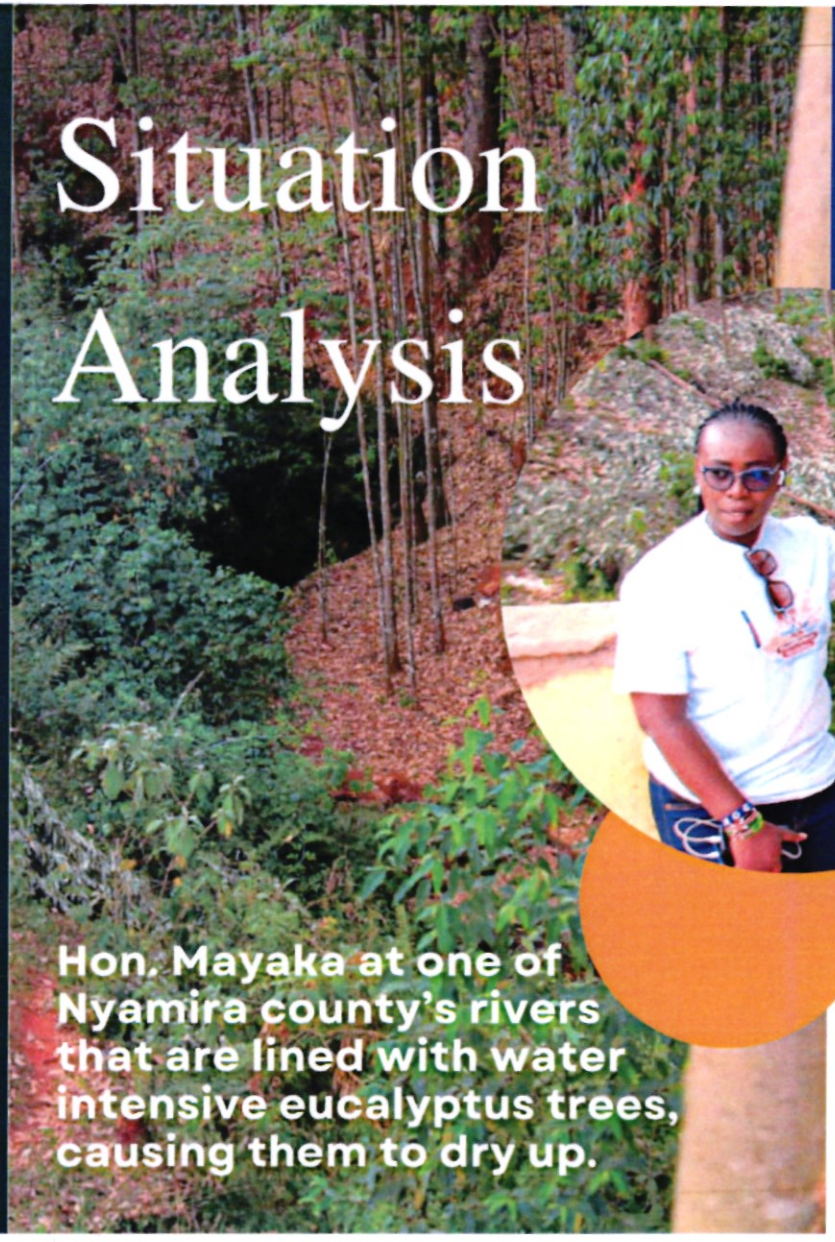
Eucalyptus tree

Grown for sale as windbreaks and telephone poles, the eucalyptus tree can draw as many as 90 litres of water a day in wet conditions and 40 litres in dry conditions

Key Counties Affected, with a lot having wetlands within their boundaries::

- Bomet
- Narok
- Nyamira
- Siaya
- Kisumu
- Homa Bay
- Bungoma
- Kakamega
- Busia
- Kiambu
- Nairobi
- Machakos
- Mombasa
- Kilifi

Situation Analysis



Hon. Mayaka at one of Nyamira county's rivers that are lined with water intensive eucalyptus trees, causing them to dry up.

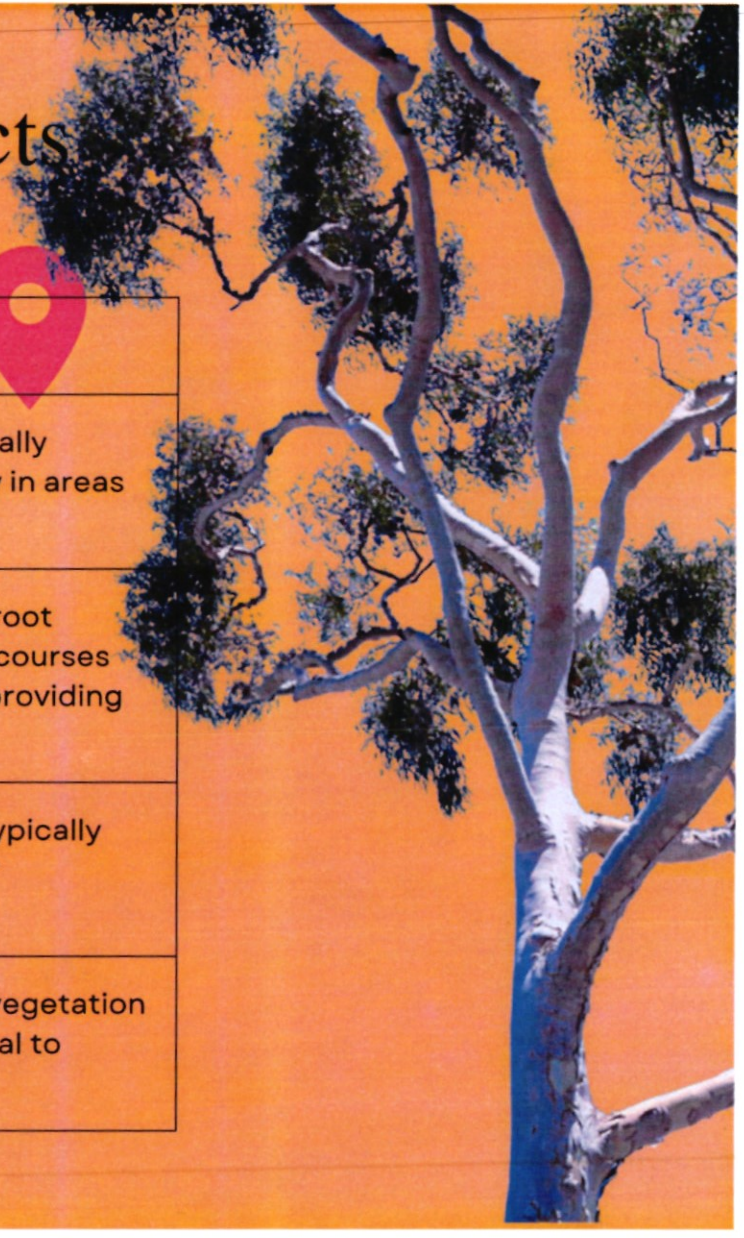
Nyamira has had 10 major rivers. These rivers have nourished my community and supplied the vitally important Lake Victoria.

2out of 10

80% the rivers in Nyamira are on the verge of extinction due to the rise of artificial forests that line the banks for the heavy consumption of their water.

Eucalyptus Species and Their Effects

Species	Characteristics & Effects
Eucalyptus globulus (Blue Gum)	Known for its water-hungry nature, it can potentially deplete water sources, affecting rivers especially in areas with limited water availability.
Eucalyptus camaldulensis (River Red Gum)	Commonly found along riverbanks, its extensive root system may reduce river flows and dry out watercourses despite its benefits in stabilizing riverbanks and providing habitat.
Eucalyptus deglupta (Rainbow Gum)	While appreciated for its colorful trunk, it is not typically associated with significant direct effects on river ecosystems.
Eucalyptus grandis (Flooded Gum)	Found in floodplain areas, it may displace native vegetation and alter riparian ecosystems, despite its potential to support aquatic wildlife.

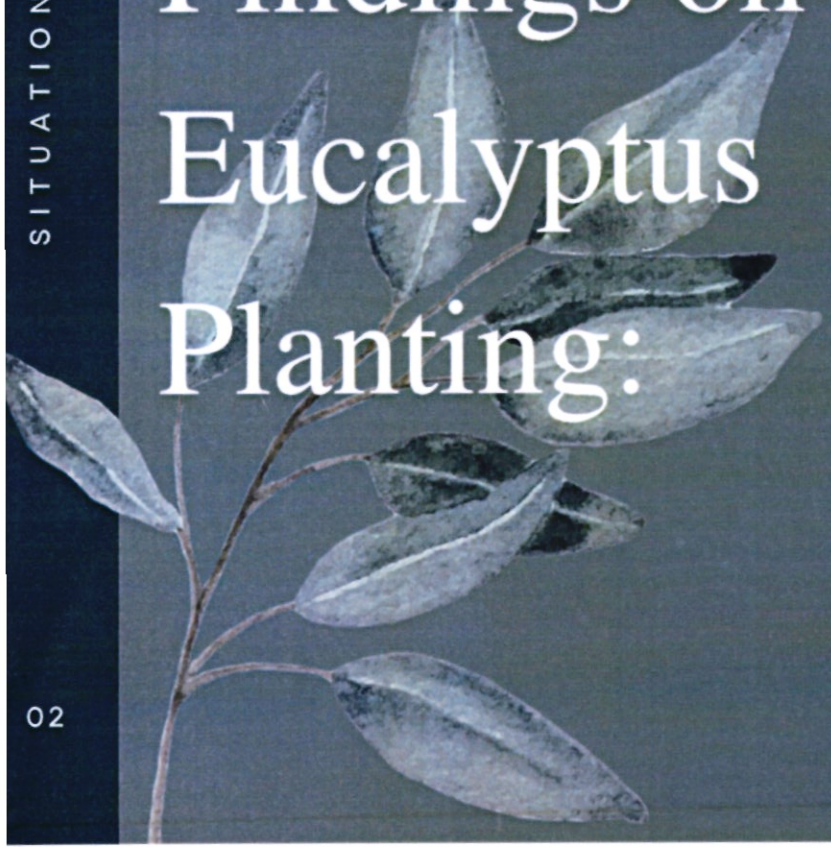


Impact

Our drying rivers have affected our vital resource mobilisation pratices:

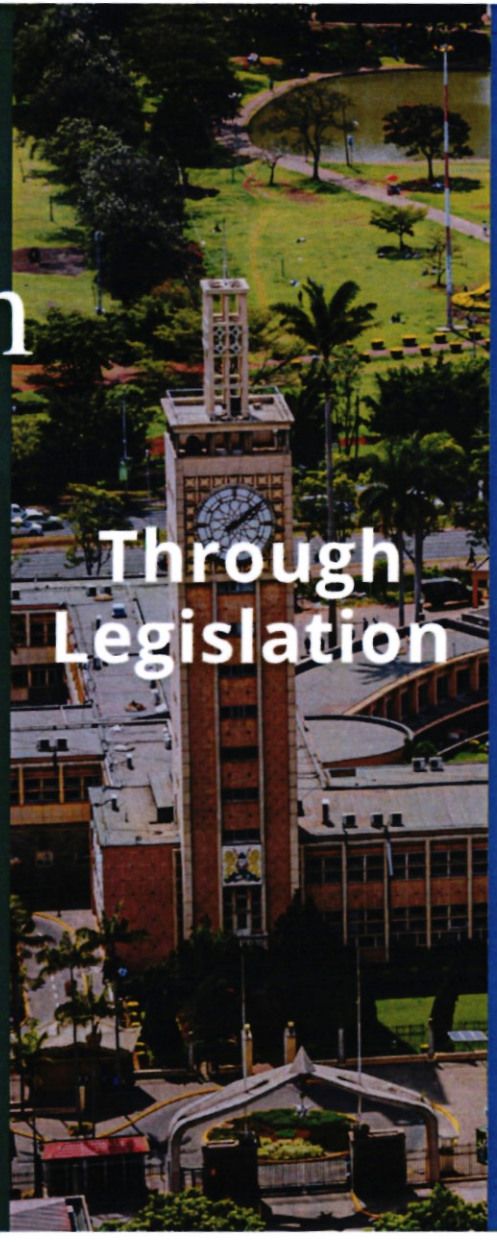
- lower yield of other crops
- reduced sanitation
- scarce access to drinking and
- cooking water
- more expensive hydro-electric
- power supply

Expert Findings on Eucalyptus Planting:



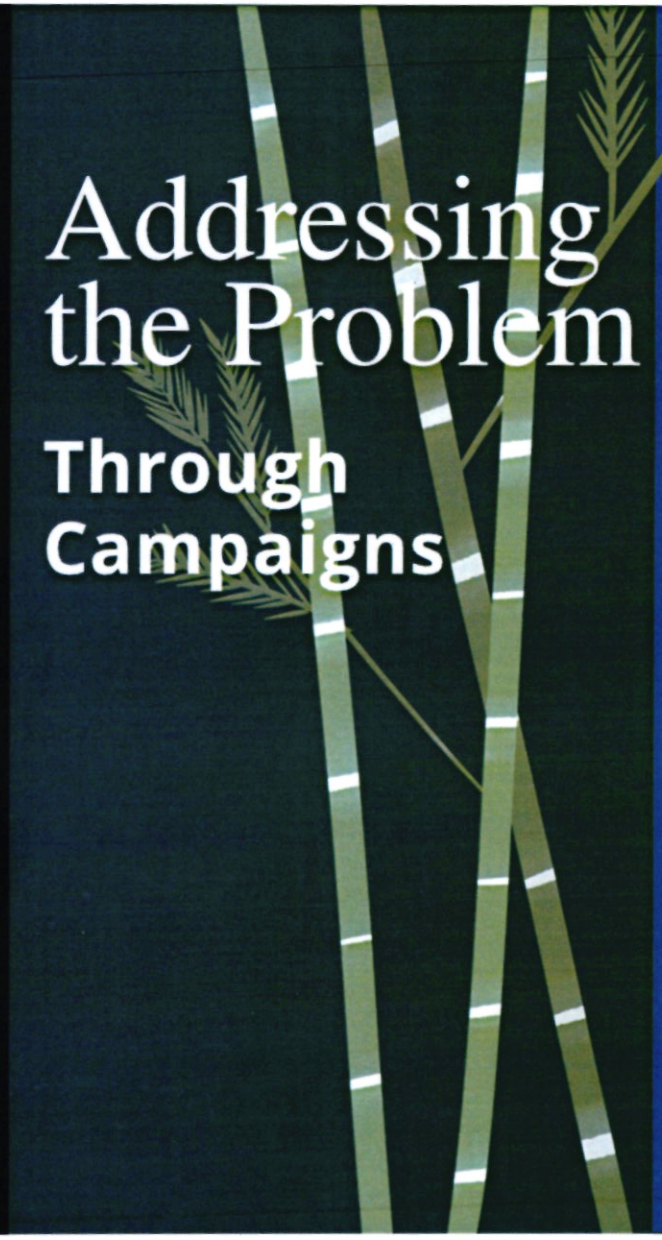
Experts highlight the high water demand of eucalyptus trees, their impact on biodiversity through toxic leaf litter, and their contribution to soil degradation due to competition for nutrients and moisture, which can lead to reduced biodiversity and soil erosion.

Addressing the Problem



Through Legislation

I proposed an amendment bill to Kenya's Environment and Coordination Bill 2022 to introduce a clause prohibiting the planting of eucalyptus trees along water bodies.



Addressing the Problem

Through Campaigns

Insupport of the amendment bill, I propose we engage meaningful partnerships to roll out sensitisation campaigns to offer commercial growers ofwater-intensive crops an alternative solution.

For example replacing the eucalyptus with the bamboo would benefit both the environment and the farmer.

- Bamboo isa waterreservoir, collecting and storing large amounts of water during rainy season, and returning it to the soil during droughts
- Giant bamboo trees have extensive fibrous roots that control soil erosion, making soils more stable for other forms of farming.
- Bamboo qualifies as a renewable resource because unlike other sources of biomass (trees). It matures in about four years and can be harvested for many years

Commercial Uses of the Bamboo:

- handicrafts production of chopsticks window
- blinds flooring
- furniture
- (carpentry) panels builders' joinery
- Paper/pulp
- Construction (unprocessed bamboo)

Taking Initiative to

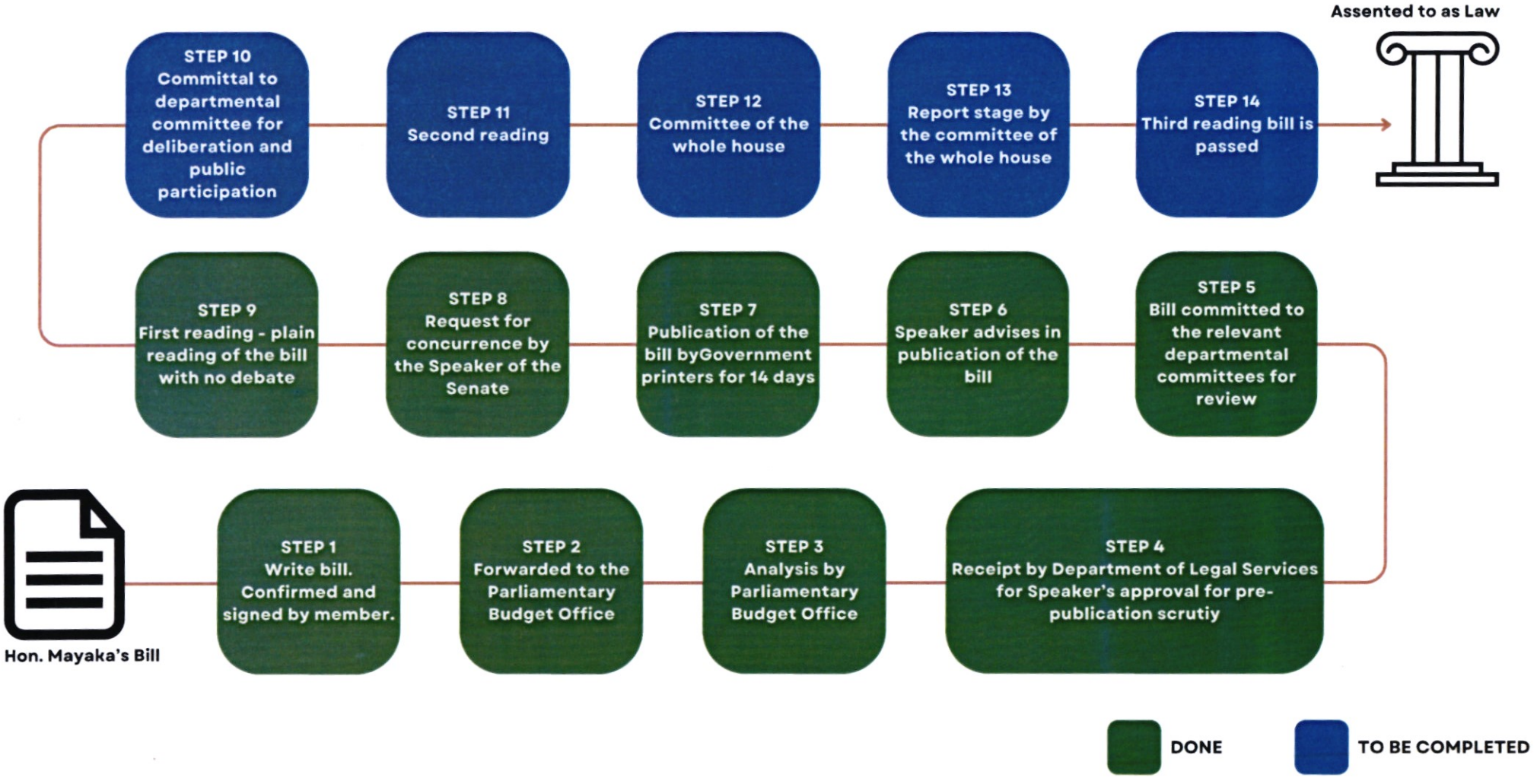
Address the Problem

Awareness Raising

In partnership with a Nyamira school, I rolled out a tree planting mission, through which productive talks with key stakeholders were sparked about replacing eucalyptus trees with less water intensive plantations that also have commercial value.

Targeting the youth as our future's custodians, I organized a local football tournament dubbed Super MP Cup; through it raising awareness on our ecological crisis. The tournament's theme - #RevivingOurRivers - is getting news coverage and is attached to a social media campaign.

PROGRESS WITH THE BILL 19 MAR 2024



Call to Action

Legislative Support

Any Kenyan's individual efforts, if not enforceable by law, would easily be delegitimise by our community members who are specifically invested in maintaining the current place of the eucalyptus tree.

Therefore it is important to receive the backing of my fellow Members of Parliament in the passage of an amendment to the Environment and Coordination bill in the National assembly.
I earnestly appeal to your support.

Asanteni!