



ARTIFICIAL INTELLIGENCE AS A TOOL TO ENHANCE SUSTAINABLE ELECTIONS AND WOMEN PARTICIPATION IN AFRICA: A CASE OF KENYAN ELECTIONS

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Abstract:

This article seeks to critique the adoption of electronic voting (e-voting) technologies during Kenyan elections between 2013 and 2022. It argues that e-voting can only advance universal suffrage and other democratic principles when it is preceded by strong institutional frameworks. While there is literature on ethical considerations of electronic voting in Kenya, there is inconsiderate attention on the pre-conditions which complemented these technologies and made them more accessible to women. The study found that cultural, religious and political factors have contributed to the repression of Kenya women during electoral processes. As a result, there has been reluctance to reinforce their participation in elections. However, the country's recent constitution and electoral reforms have inspired positive conditions for electoral sustainability and improved women participation. Despite these gains, e-voting systems are prone to power relations and distributional inequalities with detrimental effects on future elections and women's participation. This qualitative study draws on secondary data concerning sustainable development, women's participation and the newly adopted e-voting technologies. It underscored the significance of gender mainstreaming and political will to uphold sustainability in elections. An interpretative paradigm was adopted for the review of existing literature which includes the Actor-Network theory and the concept of gender mainstreaming. The article recommends robust gender mainstreaming policies at all spheres of government to enhance and protect women participation in the wake of electronic voting technologies. This paper is divided into six sections namely; introduction, statement of the problem, conceptual clarification and literature review, gaps in existing laws and policies concerning women participation and sustainability, legal approaches for addressing the challenges of e-voting technologies and women participation and conclusion.

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1.0 INTRODUCTION

Governments have invested in Artificial Intelligence (AI) technologies to enhance electoral integrity, anticipated to protect democratic rights of voters. Although elections have become indispensable to democracies, they have become flawed and repressive of women's political participation. Electoral manipulation has enabled incumbents to stay in power and they have been able to distort election outcomes for their own interests.¹ These offences have caused dissatisfaction and reduced confidence in electoral processes.² E-voting has emanated as an alternative to the traditional manual voting and is regarded important for its ability to encourage voter participation.

However, in many countries, there are pre-existing constraints which exacerbate electoral offences for certain populations. There is a global phenomenon of marginalising women from electoral processes. Historically, women have been under-represented in legislative and decision-making processes.³ Among others, literature has identified ethnic cleavages, patriarchy and gender prejudices as key constraints of women's participation in elections.

The history of Kenyan women's participation in electoral processes resonates with these challenges. Although they have proven themselves to be more than capable of supporting democratic principles, they have been relegated from organs of decision-making. Their votes have been manipulated by the male counterparts whose efforts were largely to

¹ Masaaki Higashilima and Hisashi Kadoya, 'The dynamics of electoral manipulation and institutional trust in democracies: Electoral Fraud and Timing, Blatant, and the Legitimacy of Governance', (2024) 88 Public Opinion Quarterly <<https://doi.org/10.1093/poq/nfae022>> accessed 08 September, 2024

² National Crime Research Centre, 'Election Crimes and Offences in Kenya', <<https://crimeresearch.go.ke/publications/Elections%20Crimes%20&%20Offences%20in%20Kenya.pdf>> accessed 19 November 2024.

³ Courage Mlambo, Forget Kapingura and Richard Meissner, 'Factors Influencing Women Political Participation: The Case of the SADC Region' (2019) 5 Cogent Social Sciences <<https://doi.org/10.1080/23311886.2019.1681048> >accessed 27 July, 2024.

retain political power. In a society that is deeply divided by ethnic identities, patriarchy, religion and gender disparities, participation in elections has been met with structural detriments. This has led to entrenched insecurities concerning Kenya's electoral system. The aftermath of the 2007 elections was a result of grievances concerning voters' register, ballot stuffing, intimidation and faulty data collected from voting systems.⁴ To mitigate these deficits, Kenya underwent reforms which significantly encouraged women's participation in elections.

Following the adoption of the 2010 constitution and other human rights treaties to protect political rights, significant strides have been made to redress the marginalisation of Kenyan women's participation in elections.⁵ The Independent Electoral and Boundaries Commission (IEBC) replaced the Electoral Commission of Kenya (ECK) and was established in 2011 with clear mandate to promote electoral integrity. There was mounting pressure to entrench gender quotas across all government spheres to have women in key political positions. The two-thirds gender rule of the constitution demanded that female representation in decision making processes across all spheres of government should be realised.⁶

The constitutional and electoral reforms coincided with global efforts to counter democratic recession. The early 2010s saw the surge of flawed democracies and authoritarian regimes. In Europe, full democracies became flawed with those in the Middle East deepening autocratic regimes. Many democracies in North and Sub-Saharan Africa

⁴ Francis Aywa, 'Kenya' in Eugene Ntaganda and B Makulilo (eds), *Election Management Bodies in East Africa*. (African Minds 2016).

⁵ Gloria Kenyatta, 'The Political Participation of Women in Kenya', (2023) 25 (2) *Journal of International Women's Studies* 1.

⁶ Aneisa Babkir, 'Kenya's Continual Failure to Meet Their Two-Thirds Gender Quota'. (Oxford Human Rights Hub, 17 April 2023) < <https://ohrh.law.ox.ac.uk/kenyans-continual-failure-to-meet-their-two-thirds-gender-quota/> > Accessed 07 October, 2024.

experienced the ‘roll back’ on democracy.⁷ Together with environmental depletion, the collapse of liberal markets and other concerning issues, democratic decline became a global concern. The Sustainable Development goals (SDGs) became the blue print for incremental change. For women, it meant gender quota to increase the assumption of political leadership across spheres of government. It also meant that there would be deliberate measures to remove gender biases from society.

While exponential usage of AI technologies are expected to support democratic freedoms, reinforce peace and unity,⁸ their success or failure in relation to encouraging women participation is largely determined by the political landscape in which they are functioning. In an enabling environment, they carry potential to positively encourage women’s participation. The possibilities of reverting women participation are high when the political landscape is repressive of their democratic rights.

It is against this backdrop of electoral sustainability, gender mainstreaming and e-voting ecosystems that this article argues that Kenya’s efforts to encourage women’s participation in election is commendable and should be sustained by convergence of multi-sectoral policies. This would ensure that e-voting technologies do not become prone to gender biasness.

1.1 Statement of the problem

It has become crucial for electoral processes to adopt policies which reinforce shared principles of sustainability. The establishment of the SDGs in 2015, has led to a positive gradual shift towards the adoption of electoral sustainability. The broader concept of sustainability

⁷ Economist Intelligence Unit, ‘ Democracy index 2010. Democracy in retreat’ (The Economist, 2010) < https://graphics.eiu.com/PDF/Democracy_Index_2010_web.pdf. > Accessed 10 June, 2025.

⁸ Iris-Panagoita Efthymiou, Anastashia Psomiadi, Kyvele Diaramé and Souzana Chatzivasileiou, ‘Using AI Change the Paradigm of Women’s Participation in Politics’ (2020) 1 (2) HAPSc Policy Briefs Series <<http://dx.doi.org/10.12681/hapscpbs.26479> > accessed 07 October, 2024

encompasses among others the promotion of education, social equity, access to public services, ethical leadership, partnership and accountability. If elections are to be sustainable, they have to be viewed as a unit of a multi-faceted democratic system embodying the above-mentioned principles to uphold democratisation processes. That is beyond electoral cycle, elections need to continuously reinforce human rights, peace, equal participation, information integrity, public trust in democratic institutions.⁹ Elections are expected to strike a balance of sustainable principles because the erosion of one goal, leads to the collapse of others.

To determine if communities are ready for e-voting systems, a preliminary e-readiness study is commonly undertaken in a certain geographical space. This enables companies or organisations to provide a framework that determines the citizens readiness for new technologies that are been adopted for common use.¹⁰ The concept of e-voting readiness became critical to generating empirical evidence on the readiness of human resources and infrastructure for effective electoral election processes.¹¹ Despite the importance of e-readiness, there is insufficient data that reflects on the readiness of women ahead of the usage of e-voting technologies.

The post-2017 electoral violence prompted for change in the administration of elections. As study on Kenya's readiness for e-voting technologies by Mokodir measured technology readiness which includes network infrastructure, Internet availability, affordability speed, quality Information and Communication Technology (ICT) services and support. Secondly, it evaluated ICT competency of the workforce. The

⁹ Sarah Lister, 'The role of democracy in sustainable development' (UNDP, 14 September 2024) <https://www.undp.org/blog/role-democracy-sustainable-development> accessed 12 June 2025.

¹⁰ Emaase Mokodir, 'E-voting readiness in Kenya: A case study of Nairobi county'. University of Nairobi.

¹¹ Habibu Ahmed and Godfrey Mwandosya, 'Exploring the readiness for electronic voting (E-Voting) in emerging economies: evidence from Dodoma, Tanzania. (2024) 5 (4) African Journal of Empirical Research. College of Business Education.Tanzania.

third indicator concerned e-society and how the general public leverage ICT and electronic content. Security and trust used indicators to measure security of equipment and software, privacy and copyright issues.

Another key area of study in the existing literature on e-voting readiness has been the issue of cost-effectiveness. Considering the high costs of manual electoral systems, scholars have been engaged in discourses about government expenditures on voter registration and the polling processes.¹²

Although the existing literature is pivotal to understanding e-voting readiness, it has rather been about technical issues. There is insignificant attention on gender dimensions so as to determine how they interact with new e-voting technologies. In particular, research on Kenya's e-voting readiness has not considered how gender mainstreaming policies advance electoral sustainability principles such as human rights and public trust in democratic institutions. The article started with (I) Introduction as section one while the second heading focused on (ii) Conceptual clarification and literature review. The third aspect delved onto (III) Gaps in existing laws and policies concerning integrating sustainability and (IV) Legal approaches for addressing the challenges of e-voting technologies and Kenyan women's participation. The article concluded with (V) which is the concluding aspect of the manuscript.

2.0 CONCEPTUAL CLARIFICATION AND LITERATURE REVIEW

2.1 Electoral Sustainability

As mentioned, electoral sustainability derives from the broader concept of sustainability. Origins of sustainability can be traced to literature on environmental welfare. It denotes that actions inflicted on the

¹² Carl Dundas, 'Electoral sustainability and the cost of development' (2001) 1 (1) *Journal of African Elections* <https://www.eisa.org/storage/2023/05/2001-journal-of-african-elections-v1n1-electoral-sustainability-costs-development-eisa.pdf?x82092> accessed 12 June 2025.

environment have long lasting effects on the future. Without careful consideration, the future is likely to suffer from actions and decisions made in the present. Therefore, there needs to be structural changes, practical solutions to the present challenges without compromising on the future.¹³ This idea of preserving the future has attracted enormous attention in the paradigms of development which involve enormous transformation in social structures, poverty eradication and reduction of societal inequalities.¹⁴ In 2015, the United Nations (UN) adopted the 2030 Agenda with 17 SDGs informed by consultative processes with communities around the world. The communities envisioned the redress of their societal challenges and a future devoid of those constraints.¹⁵ Although these goals are interconnected, SDG 5 and SDG 16 are most aligned to this study. SDG 5 strives for gender equality and pleads for the eradication of discriminatory laws and promotion of gender quotas. SDG 16 aims to cultivate resilient institutions for inclusive societies. It identified civil conflicts and under-representation as some of the challenges to achieving social inclusion.¹⁶ As systems of electoral processes, e-voting technologies are expected to safeguard the ideals of the SDGs.

Democracy has also come under scrutiny for failure to deepen democratization of government and other state institutions, thus the large-scale demand for electoral reforms and principles of sustainability. Elections as a core feature of democracy are seen as an enabler of sustainable development. Although, elections are exercised across the African continent they have not always sustained democracy as they have

¹³ Ulrich Grober, 'Deep roots- a conceptual history of 'sustainable development' (Wissenschaftszentrum Berlin für Sozialforschung, 2007).

¹⁴ Justine Mensah and Sandra Casadevall, 'Sustainable development: Meaning, history, principles, pillars and implications for human action: Literature Review. (2019) 5 (1) Cogent Social Sciences < <https://doi.org/10.1080/23311886.2019.1653531>> accessed 11 June 2025.

¹⁵ UNDP, 'Sustainable Development Goals. Background on the goals (SDG Accelerator) <https://www.undp.org/sdg-accelerator/background-goals> accessed 12 June, 2025.

¹⁶ Department of Economic and Social Affairs, 'Achieve gender equality and empower all women and girls'. (SDGS, 2022) <https://sdgs.un.org/goals/goal5> accessed 13 June, 2025.

become indispensable to political conflicts. These political conflicts have resulted in regular bouts of violence, eroding the very principles of democracy.¹⁷ Issues of sustainability in electoral processes continue to be very political and informed by the environment in which they are taking place.

2.2 The Concept of E-Voting

Electronic-voting originates in the greater systems of artificial intelligence. Artificial intelligence can be defined as computational systems with the ability to accomplish tasks that normally rely on human intelligence. It is built with thinking capacities and the probability of being able to execute tasks as if they were human.¹⁸ These tasks include decision-making, making predictions and artificial interactions.¹⁹ It has been regarded as a transformative agent in electoral processes. In elections, it is embodied by e-voting which is anticipated to improve voter participation, voter registration, monitoring, and result outcomes.²⁰ E-voting relies on complex networks controlled by human participants and interacts with preferences and power distribution of those in the political spectrum. They can be conditioned to deepen gender biasness and stereotypes.²¹

¹⁷ Olugbemiga Samuel Afolabi, 'Elections, Politics, Democracy, and the challenge of sustainable development in Africa. in Kassa Alemu and Mulunesh Alebachew (eds), *Handbook of research on Sustainable Development and Governance Strategies for Economic Growth in Africa*. (IGI Global 2018).

¹⁸ Chris Smith, 'The History of Artificial Intelligence' (University of Washington 2006) 4.

¹⁹ Humero Gil de Zúñiga, Manuel Goyanes and Timilehin Durotoye, 'A Scholarly Definition of Artificial Intelligence (AI): Advancing AI as a Conceptual Framework in Communication Research'. (2024) < <https://pure.psu.edu/en/publications/a-scholarly-definition-of-artificial-intelligence-ai-advancing-ai>>accessed 25 December 2024'.

²⁰ Scott Timcke, "Harnessing Artificial Intelligence (AI) for Transparent Elections: A New Dawn for African Democracy"(AUDA-NEPAD, 20 June 2024)< <https://nepad.org/blog/harnessing-artificial-intelligence-ai-transparent-elections-new-dawn-african-democracy> >accessed 01 September 2024.

²¹ Maria Sideri and Stefanos Gritzalis, "Gender Mainstreaming Strategy and the Artificial Intelligence Act: Public Policies for Convergence" (2025) 4 (2) *Digital Society* <https://link.springer.com/article/10.1007/s44206-025-00173-y> accessed 01 May 2025.

For e-voting to enhance electoral integrity, it should be based by common democratic principles. Like manual voting systems, it is expected to support universal suffrage and endorse the eligibility of every voter participating in the elections. Further, it should protect the ‘one voter, one vote principle’ and advance the freedom to express political choices without any fear.²² Adherence to democratic principles encourage social equity, fairness in resource distribution, peace, economic prosperity and other SDG goals.

2.3 Actor-Network Theory

The Actor-Network Theory sought to understand how relationships are established between people, ideas, and technologies. The theory reasserts that society encompasses human and non-human participants. It is heterogeneous and relies on interaction of all participants. Although, non-human participants like machines are enabled to participate in this heterogeneous society, they are leveraged by humans.²³ E-government models such as e-education, e-payment, and e-transport are among the earliest inventions which reinforce technology-enabled networks to engage with citizens. Recently governments have integrated messenger applications like Whatsapp, Twitter which are integrated in political communication to provide information and encourage citizenry participation.²⁴

Through the lens of the Actor-Network Theory, block chain technologies consist of decentralised networks which are all interconnected to serve a particular purpose. These ideas are consistent with scholars who consider e-voting as systems belonging to a network

²² Lilian Mitrou, Dimitris Gritzalis, Sokratis Katsikas and Gerald Quirchmayr, “Electronic Voting: Constitutional and Legal Requirements, and their Technical Implications in Dimitri Gritzalis (ed), *Secure Electronic Voting* (Springer US 2003).

²³ John Law, “Notes on the Theory of the Actor-Network: Ordering, Strategy and Heterogeneity” (1992) 5 *Systems Practice and Action Research* 379-393.

²⁴ Sylvia Marcos-Garcia, Hugo Fabregat, Andreu Casero-Ripollés, “The Platformization of Institutional Political Communication. The Use of Whatsapp by Local Administrations”, (2021) <79 (79) *Revista Latina de Comunicación Social*. <http://dx.doi.org/10.4185/RLCS-2021-1520> accessed 28 September 2024.

with the ability to record and verify every transaction that has taken place.²⁵ For example, these responsibilities are decentralised in polling stations and they feed onto national tally centres which are then responsible for consolidation of results. Like earlier inventions, e-voting is conditioned by human interests and is subjected to distribution of power of electoral stakeholders including electoral bodies, political parties, voters, civil society and others. It is for this reason that this article emphasises on power relations and how they determine the participation of women in e-voting technologies.

2.4 Gender Mainstreaming

Gender mainstreaming was first proposed at the United Nations' Third World Conference, held in Kenya in 1985. Ten years later, the 1995 Beijing Platform for Action became a global blueprint for gender mainstreaming. It emphasised twelve key areas in which gender perspectives were to be considered by policymakers. Gendered transformation became crucial in areas such as power and decision-making, human rights, health, education, and institutional mechanisms for the advancement of women and media.²⁶ Following the 1995 Beijing Platform, gender mainstreaming has greatly emphasised on access to education for long-term development of women.²⁷ By advancing gender quotas, Kenya's 2010 constitution positively aligns with gender mainstreaming. Kenya's Vision 2030 is an extension of constitutional provisions as it reiterates on the aspirations of realising gender parity at all spheres of government. It also scores positively with SDG 5 as it reflects Kenya's intentions to reach the gender quotas and eradication of gender biasness in the political landscape.

²⁵ Mohammed Berenjestanaki, Hamid Barzegar, Nabil El Loini and Claus Paul, 'Blockchain-Based E. Voting: A Technology Review', (2023) 13 (1) Electronics <https://doi.org/10.3390/electronics13010017> accessed 07 November 2024.

²⁶ United Nations Development Programme, 'Gender Mainstreaming' <<https://www.unwomen.org/en/how-we-work/un-system-coordination/gender-mainstreaming>> accessed 25 August, 2024.

²⁷ Mark Hallie, 'Finance' in *Sustainable Development Goals, IISD Perspective on the 2030 Agenda for Sustainable*, (International Institute for Sustainable Development, 2016) 14.

2.5 A Historical Review of Kenyan Women's Participation in Elections

In the most recent census, Kenyan women were estimated to be over 24 million, making up just over 50 percent of the total population of 47,564 million.²⁸ They belong to at least 42 ethnic groups with the Kikuyu, Luhya, Kalenjin, Luo and Kamba being the most dominant.²⁹ Despite making up most of the voter population in elections, they have been historically marginalised from political participation.³⁰ Political participation, including in elections, has been constrained by patriarchal norms, ethnic cleavages and incapacities of state institutions.³¹

During the colonial period, administrators marginalised Kenyan women from political participation and rather favoured their male counterparts. As a colony of Britain, the British preferred to grant decision-making powers to the men.³² On the periphery of the political landscape, Kenyan women organised themselves into liberation movements to fight against the colonial rule.³³ For example during the Mau Mau rebellion, women established networks to sustain the fight against white domination which had moved Kenyans away from fertile lands. They became vital in assisting their male counterparts (the fighters) by physically providing

²⁸ Kenyan National Bureau Statistics, "2019 Kenya Population and Housing Census", <<https://www.knbs.or.ke/wp-content/uploads/2023/09/2019-Kenya-population-and-Housing-Census-Volume-1-Population-By-country-And-Sub-Country.pdf>> accessed 16 March 2025.

²⁹ Jasper Nyaura, "Devolved Ethnicity in Kenya: Social, Economic and Political Perspective", (2018) 11 (16) *European Review of Applied Sociology* 2.

³⁰ Eija Ranta, "Intersecting Inequalities in Women's Political Inclusion in Kenya", (2024) 26 (4). *International Feminist Journal of Politics* 881-902.

³¹ Gloria Kenyatta, 'The Political Participation of Women in Kenya', (2023) 25 (2) *Journal of International Women's Studies* 1.

³² Esther Kibuka-Sebitosi, 'Gender Dynamics in Elections', (2013) 12 (3) *Journal of African Elections* 120-141.

³³ Dorothy Nyakwakwa and Millicent Mokua, 'Women Participation in Kenyan Elections: 1963-2017' (2024) 8 (1) *Kenya Studies Review* 14.

transport, medical and messenger services.³⁴They sustained fighters by providing food and also cared for their children.³⁵

Having demonstrated their willingness to participate in political movements, Kenyan women were hopeful that the dawn of independence in 1963 would afford them opportunities for political participation. However, President Jomo Kenyatta inherited the colonial institutions and policies which continued to side-line women from political participation.³⁶As a result, not a single woman made it in Kenya's first parliament since independence.³⁷the Kenyatta regime had explicitly marginalised women. During his presidency, a total number of six women contested for political leadership in the 1969.³⁸However many of them were relegated to subordinated positions as care-givers. They were stripped of political rights to contest for political leadership and rather assisted male politicians in their political aspirations.

Angelo's interview with Jael Mbongo gives a detailed account of how the political icon's voice had been silenced when she raised concerns about exploitation subjected to women by male political leaders. Wambui Otieno, contested for political position in 1969 but was met with scrutiny for the marriage choices she had made. As a member of the Kikuyu tribe, she was stigmatised for being married to a man from the

³⁴ Margaret Gachichi, " *The Role of Kikuyu Women in the Mau Mau*", (University of Nairobi 1986).

³⁵ Bethany Rebisz, 'Kenya's Female Freedom Fighters Were The Silent Heroes of the Anti-Colonial Movement- Here Are Some of Their Stories', (The Conversation, 19 October 2024) <<https://theconversations.com/kenyas-female-freedom-fighters-were-the-silent-heroes-of-the-anti-colonial-movement-here-are-some-of-their-stories-241374> >accessed 16 April 2025.

³⁶ Dorothy Nyakwakwa and Millicent Mokua, 'Women Participation in Kenyan Elections: 1963-2017' (2024) 8 (1) Kenya Studies Review 14..

³⁷ Jill-Cottrel-Ghai, Yash Ghai, Korir Sing' Oei and Waikwa Wanyoike, 'Taking Diversity Seriously. Minorities and Political Participation in Kenya'(Minority Rights, 28 January 2013) <<https://www.eisa.org/storage/2023/05/2013-journal-of-african-elections-v12n3-gender-dynamics-elections-africa-eisa-pdf>> accessed 01 September 2024.

³⁸ Anais Angelo, "Changing the Narrative and Gendering Kenyan Political History: Jael Mbogo's Fight for Parliamentary Elections in the 1960s" (2023) 33 (1) Women's History Review <<https://doi.org/10.1080/09612025.2023.2208411> >accessed on 24 April, 2025.

Luo tribe. Philomena Chelagat Mutai was accepted into politics in 1994 by virtue of her association with her male counterparts.³⁹ Like in the case of Otieno, she had gained political experience prior to the elections but it was still not adequately acknowledged.

During his one-party state rule from 1978 to 2002, President Arap Moi deepened the 'state social construction' of gender identities, explicitly reduced women to sub-ordinates of their male counterparts. His ideas or perceptions would be carried into politics of the state which largely silenced women.⁴⁰

It was also during Moi's presidency that a women's political movement *Maendeleo ya Wanawake Organisaition* (MYWO) would be pivotal to the dissemination of gender and cultural identities as constructed by the political elites and society at large. Ironically, these women were to a large extent organised not to emancipate other women but rather validate the president's ideas and perceptions. The autonomy of MYWO had been undermined when Moi directed that it be joined to Kenya African National Union (KANU), a calculated decision that would let him personalise political power.⁴¹

The political participation of Kenya's renowned female political figures such as Wangari Mathai was also nullified by MYWO.⁴² An esteemed academic and social activist, Mathai would endure fierce opposition when she participated in elections. She defied gendered roles which

³⁹ Lanoi Maloiy, 'Tracing Kenyan Women's Involvement in Elections and Political Leadership from 1963-2002' in Nanjala Nyabola and Marie-Emmanuelle Pommerolle (eds), *Where Women Are*. (Africae and Twaweza Communicaitons 2018).

⁴⁰ Florence Ebila, 'A Proper Woman, in the African Tradition: The Construction of Gender and Nationalism in Wangari Maathai's Autobiography Unbowed'. (2015). 52 (1) *Tydskrif vir Letterkunde* <<https://doi.org/10.4314/tvl.v52i1.10>. > Accessed 12 April 2025.

⁴¹ Korwa Adar and Isaac Munyae, 'Human Rights Abuse in Kenyan Under Daniel Arap Moi, 1978-2001' (2001) 5 (1) *African Studies Quarterly* 1-17.

⁴² Florence Ebila, 'A Proper Woman, in the African Tradition: The Construction of Gender and Nationalism in Wangari Maathai's Autobiography Unbowed'. (2015). 52 (1) *Tydskrif vir Letterkunde* <<https://doi.org/10.4314/tvl.v52i1.10>. > Accessed 12 April 2025.

confined women to domestic chores and had carried these sentiments in electoral processes.⁴³

Even after the return of multi-partyism in 1991, Kenyan women would continue to struggle to secure political leadership positions. The historical narrative of bestowing political power upon their male counterparts meant that they continued to be less influential in electoral processes.⁴⁴ It was rather tokenistic rather than genuine commitment of the state towards equal gender representation.⁴⁵ Against these hostilities that women have been subjected to, voting systems have been strategically captured to eliminate their participation as voters and candidates.

2.6 Kenyan Women's Participation and Traditional Voting Systems

Given their social status, Kenyan women had been subjected to systematic marginalisation. As a result, electoral systems would further undermine participation of women in elections. Firstly, the IEBC 'had no teeth, in that they had no power to enforce any laws or codes of conduct'.⁴⁶ As a result, the electoral body would not be held accountable by incumbents for gross violations against political rights of others. The traditional paper-based voting systems could easily be leveraged by political elites to achieve victory in electoral processes.

Political patronage is rife during elections and in networks tied to the political elite, ballots become prone to manipulation. A candidate in the

⁴³ Gail Presbey, 'Women's Empowerment: The Insights of Wangari Maathai', (2013) 9 (3) *Journal of Global Ethics* 272-292.

⁴⁴ Nyokabi Kamau, 'Women and Political Leadership in Kenya' (Heinrich Böll Foundation, 2010) < https://ke.boell.org/sites/default/files/women_in_leadership_study.pdf > accessed 17 September 2024.

⁴⁵ Sebastian Gatimu, 'Kenyan Politics. Where Have All the Women Gone?' (Institute for Security Studies, 24 May 2016) < <https://issafrica.org/iss-today/kenya-politics-where-have-all-the-women-gone> > accessed 10 April 2025.

⁴⁶ Mike Yard, 'In Kenya, Using Technology for Safer Elections', (IFES, 22 June 2012) <https://www.ifes.org/news/kenya-using-technology-safer-elections> > accessed 18 August 2024.

1969 parliamentary elections, Jael Kambo recalled how ballot boxes were hidden and some were even burnt. Agents who had been entrusted to exercise security measures were bribed so that they did not disclose these offences.⁴⁷ All these occurrences taking place under the weak administration of the electoral body that had ties with the political elite.

Traditional manual systems also lacked the ability to exercise all the activities including ballot marking, vote encryption and counting simultaneously. Once voting had taken place, it had to be tallied at a certain time which created opportunities for vote rigging and other election-related offences⁴⁸. Given their social status and lack of accountability, women became vulnerable to systematic corruption during electoral cycles.

The issue of “time tax” during elections has been a concern in studies that have looked into time length of traditional voting systems and its implications on voter behaviour. Long queues on elections have resulted in voters being unable to vote as they have had to wait long to cast their votes⁴⁹. While there are various reasons which may influence the time taken for voters to complete the voting process, manual systems demand the actual physical labour force to complete multiple tasks for each voter. In Kenya, the reality of enduring long queues on election day had not been far-fetched.⁵⁰

Research indicates that household errands are also contributing factors which may discourage women to stand in long queues. As already

⁴⁷ Anais Angelo, ‘Changing the Narrative and Gendering Kenyan Political History: Jael Mbogo’s Fight for Parliamentary Elections in the 1960s’ (2023) 33 (1) Women’s History Review <https://doi.org/10.1080/09612025.2023.2208411> >accessed on 24 April, 2025

⁴⁸ Al- Sewie Alsaya and Sellappan Palaniappan, ‘Developing a Secure and Trusted E-voting System for Libyan Elections (2022) 7 (3) International Journal of Professional Business Review <https://doi.org/10.26668/businessreview/2022.v7i3.0347> accessed 26 August, 2024.

⁴⁹ Elora Mukherjee, ‘Abolishing the time tax on voting’, (2009) 85 Notre Dame 177.

⁵⁰ Andrew Harris, ‘Do elections queues change election outcomes?’ (Democracy in Africa, 2021) <<https://democracyinafrica.org/do-election-queues-change-election-outcomes/> > accessed 12 January, 2026

discussed, Kenya women have for long being inundated with domestic chores which by cultural standards preceded political participation. Given the time consumed by manual voting systems, Kenyan women faced difficulties as they would have to submit to gender-specific responsibilities while participating in elections. Lengthy queues also subjected women to greater chances of experiencing the eruption of violent outbursts.⁵¹ In a political climate marred by violence, time spent participating in elections has subjected Kenyan women to physical and emotional abuse. Generally, a volatile climate intimidates and discourages women to be expressive of their leadership preferences.⁵² The prevalence of voter suppression through violence and intimidation affects not only the voter turnout but also opportunities to elect women into leadership positions.

There is a consensus in literature that Kenyans vote along ethnic lines. The 2007 post electoral violence was underpinned by ethnic politics. It was believed President Mwai Kibaki was representing the interests of his Kikuyu tribe. As a result, he exerted his political power to manipulation electoral outcomes. The electoral manipulation disadvantaged the opposition leader, Raila Odinga who belongs to the Luo tribe.⁵³ Because voter fraud compromises accountability and equal representation⁵⁴, Kenyan women belonging to tribes were far removed from political power and resources leveraged to favour the incumbents. Under these circumstances, women are also discouraged from participating in elections thus lower voter-turnout.⁵⁵ About women's

⁵¹ ACE, 'Barriers to Women's Voter Registration', (The Electoral Knowledge Network, 23 July 2013) <<https://aceproject.org/electoral-advice/archive/questions/replies/277728362>> accessed 24 April, 2025.

⁵² Purity Lund, 'Female Perceptions of Women in Politics in Kenya', (Norwegian University of Life Sciences 2021) 8, 9.

⁵³ Benjamin Marx, Vincent Pons and Tavneet Suri, 'Voter Mobilization Can Backfire: Evidence From Kenya' (Poverty Action Lab, 2016) https://www.povertyactionlab.org/sites/default/files/research-paper/Voter-Mobilization-can-backfire-Evidence-from-Kenya.marx_suri_2016.pdf accessed 23 March, 2025.

⁵⁴ Halfdan Lynge, 'Electoral Manipulation in the Grey Zone' (2023) 22 (2) *Journal of African Elections* accessed 29 April 2025 144.

⁵⁵ *Ibid.*

participation, the traditional voting systems functioned in complex networks which determined the extent to which they enabled gender equality. In the absence of policies that enhance equal political participation, women became vulnerable to irregularities across the entire electoral cycle.

2.7 Favourable Conditions for Kenyan Women's Participation Before the Adoption of E-Voting Technologies

It is worth noting that prior to the adoption of e-voting; there were conditions which were already favouring the participation of Kenyan women in electoral processes. Since the early 2010s, the Kenyan government passed numerous laws to support women participation and representation in elections. The 2010 constitution had incited radical changes in the political terrain which decentralised power and enforced women leadership.⁵⁶It declares that Kenya is a 'multi-party democratic state' with article 27 stating that '*not more than two-thirds of the members of elective or appointive bodies shall be of the same gender.*'⁵⁷This constitutional provision would shape political behaviour of all electoral stakeholders to ensure that they are consistent with it.

The new constitution also sought to advance interests of previously marginalised groups, therefore enabled more constituencies to take part in electoral processes.⁵⁸ Reforms of the Electoral Act of 2012 and Political Parties Act of 2011 provided for party coalitions. As a result, smaller and major political parties formed coalitions which to a certain extent diffused ethnic identities in certain regions.⁵⁹Following the 2013 and

⁵⁶ . The Constitution of the Republic of Kenya, 2010, s 27 (8).

⁵⁷ Miriam Kilimo, 'You Can't Do Politics Without Money', (2022) 92 Journal of the International African Institute < <https://doi.org/10.1017/S0001972022000092>> accessed 06 August, 2024.

⁵⁸ Ben Nyabira and Zemelek Ayele, 'The State of Political Inclusion of Ethnic Communities Under Kenya's Devolved System' (2016) 20 Law, Democracy and Development < <https://doi.org/10.4314/ldd.v20i1.7> >accessed 02 May, 2025.

⁵⁹ Frederick Wanyama, Jorgen Elklit, Bodil Frederiksen and Preben Kaarsholm, 'Ethnicity and/or Issues? The 2013 General Elections in Western Kenya', (2014) 13 (2) 169-195 <http://dx.doi.org/10.20940/JAE/2014/v13i2a8> accessed 01 May, 2025.

2017 elections when Kenya lagged behind to meet the gender quota, political parties were compelled to nominate more women into political leadership positions.⁶⁰In 2022, Raila Odinga boldly nominated Martha Karua of the Azimio La Umoja Party to be the first female deputy presidential candidate ever in Kenyan history. Karua had also made significant strides to underscore gender equality during her campaign.⁶¹This unprecedented move became significant for Kenyan women as it demonstrated the immense potential that they have in areas of decision making processes.

Women of marginalised groups would also be steered towards greater political participation by the new constitution. Article 56 of the Kenyan constitution reinforces affirmative action to ensure that minority groups are represented across spheres of government. As a result of these new provisions, there has been an increasing the number of political leaders of previously excluded group at county level.⁶²The provisions have brought new opportunities for women of minority groups to participate as candidates and voters.

Furthermore, at least fifty-eight political groups had complied with the constitutional requirement on gender quota,⁶³ indicating a positive move towards gender equality in elections. Although still rooted in ethnic identities, there has also been an inclination towards national identity.⁶⁴There were initiatives in place that encouraged women to be

⁶⁰ Miriam Kilimo, 'You Can't Do Politics Without Money' (2022) 92 *Journal of the International African Institute* < <https://doi.org/10.1017/S0001972022000092>> accessed 06 August, 2024.

⁶¹ Halimia Ahmed, 'How the Nomination of the 'Iron Lady' has influenced Kenya's 2022 general elections' <<https://www.accord.org.za/analysis/how-the-nomination-of-the-iron-lady-has-influenced-kenyas-2022-general-elections/>> accessed 10 August, 2026.

⁶² Eija Ranta, "Intersecting Inequalities in Women's Political Inclusion in Kenya", (2024) 26 (4). *International Feminist Journal of Politics* 881-902.

⁶³ Gloria Kenyatta, 'The Political Participation of Women in Kenya', (2023) 25 (2) *Journal of International Women's Studies* 1.

⁶⁴ Eija Ranta, 'Intersecting Inequalities in Women's Political Inclusion in Kenya', (2024) 26 (4). *International Feminist Journal of Politics* 888.

more embracing of Kenya's multi-ethnicity.⁶⁵ These changing attitudes inspired confidence and enabled Kenyan women to incrementally move into-decision making processes.

There was also a significant number of young female candidates vying for political positions. The youth makes up 75% of Kenya's population and as a result are the largest demographic group to participate in elections. Not only did young Kenyan women participate as voters, but they also seized opportunities to vie for political positions. Twenty-four year old Linet Chepkorir became the youngest woman in Kenyan history to be a county representative in Kenyan parliament.⁶⁶ These positive changes inspired active participation of female youth in elections. These crucial milestones would shape elections beyond the aftermath of the 2007 post electoral violence reforms that followed thereafter.

2.8 Contribution of E-Voting System To Electoral Sustainability and Participation of Kenyan Women In Elections.

Considering electoral crimes of the 2007 elections, e-voting was first adopted during the 2013 elections.⁶⁷ The Elections Act No.24 of 2011 provided for the adoption of Biometric Voter Registration System (BVRs), Electronic Voter Identification System (EVID), Results Transmission System (RTS) and the Political Party Nomination System

⁶⁵ Fiona Blyth, 'New Constitution Helps Kenyan Women Gain Traction in Politics', (The Global Observatory, 29 March 2013) <<https://theglobalobservatory.org/2013/03/new-constitution-helps-kenyan-women-gain-traction-in-politics/>> accessed 17 September, 2024.

⁶⁶ David Wafula and Justus Netia, 'Kenya Election 2022: Linet Chepkorir, 24, Makes History in the Kenya Parliament' (*BBC*, 15 August 2022) <<https://www.bbc.com/news/av/world-africa-62546397>> accessed 13 August, 2024.

⁶⁷ Agence-France-Presse, 'Kenya Election Uses High-Tech 'checks'' <*(Voice of Africa*, 4 August 2022) <<https://www.voaafrica.com/a/kenya-s-election-uses-high-tech-checks/6686592.html>> accessed 29 August, 2024.

(PPNS) which are empowered by AI technologies.⁶⁸ These provisions are supported by broad national efforts such as the National Computer and Cybercrimes Coordination Committee.

With judicial independence reinforcing redress of electoral conflicts, the IEBC also displayed commitment to affirmative action as recommended by Federation of Women Lawyers (FIDA). Considering that women in Kenya are disadvantaged by their financial constraints, the IEBC reduced the nomination fees for female candidates.⁶⁹ This was a positive shift towards making elections women cost-effective, thus improving chances of participating in future elections.

Invaluable gains of gender mainstreaming positively affected e-voting and sustainable elections. The voter-registers which had previously been entangled in controversy for lacking reliability were updated.⁷⁰ Through biometric registrations, these new systems enabled new voter-registers that were corresponding with the identity of voters. Lower risks of stuffing voters' registers also reduced opportunities of inflating votes for male candidates.

Real-time data derived from the IEBC enabled adequate election monitoring. Contrary to the traditional manual systems, e-voting technologies reduced significant time between voting, counting and reporting of electoral outcomes. Moreover, there were minimal errors ranging from 0.1 and 2.1 percent.⁷¹ This demonstrates the ability of

⁶⁸ Vellah Kigwiru, 'The Adoption of Technology in the Kenyan Electoral Process: Lessons From the 2017 and 2017 Presidential Elections', (2019) SSRN <https://dx.doi.org/10.2139/ssrn.3383987> accessed 30 August 2024.

⁶⁹ United States Agency International Development and National Democratic Institute, 'Key gains and challenges. A general audit of Kenya's 2013 election process' (2013) <https://www.ndi.org/sites/default/files/Kenya-Gender-Audit-2013-Electoral-Process.pdf> accessed 10 June 2025.

⁷⁰ Rose Mosero, 'In Kenya's 2022 elections, technology and data protection must go hand-in-hand', (Carnegie Endowment, 2022) accessed 23 August, 2024.

⁷¹ Paul Nantulya, 'Seven Takeaways From Kenya's Consequential Election' (African Center for Strategic Studies 2022) <<https://africacenter.org/spotlight/seven-takeaways-from-kenyas-consequential-election/>> accessed 23 July 2024.

technologies to generate credible elections. For women candidates and voters, these improvements are crucial for building trust in electoral processes. As already discussed, the Kenyan political landscape is prone to electoral violence when there is suspense between voting and reporting of elections. Therefore, real-time reporting was significant to reduce opportunities of electoral violence which have previously subjected women to psychological barriers during and between electoral processes.

“Time tax” had been reduced not only by the actual voting technology but also by reinforcement of policy frameworks to make elections time efficient. In the 2017 elections, only a number of 700 voters could cast their votes at polling stations. By capping the number of voters, there was an increased need to secure additional resources to alleviate lengthy queues ⁷². These improvements are incredibly meaningful for women who had commonly been at risk of physical insecurities. As discussed earlier, Kenyan women were inundated with family responsibilities and lengthy queues meant that they would be impeded to attend to them. By implementing policies to reduce time consumed by electoral processes and complementing them by time-efficient technologies, Kenyan women stood chances to spare time for personal commitments.

There was greater transparency during elections. The IEBC data was released directly from polling stations which allowed the civil society, political parties, voter and other stakeholders to partake in predictive tallies.⁷³ Heightened transparency enriched women by allowing them access to information and as a result, they were better able to participate in elections-related discourses.

With the rule of law supporting and mediating in AI- induced elections, women could be confident that their participation in the upcoming

⁷² Andre Harris, ‘Do election queues change election outcome?’, (*Democracy in Africa*, 2021) < <https://democracyin africa.org/do-election-queues-change-election-outcomes/> > accessed 22 July 2024.

⁷³ Paul Nantulya, ‘Seven Takeaways From Kenya’s Consequential Election’, (African Center for Strategic Studies 2022) <<https://africacenter.org/spotlight/seven-takeaways-from-kenyas-consequential-election/>>accessed 23 July, 2024.

elections would be encouraged by improved democratic standards. In 2013, there were systematic failures which were justified by late arrival of technologies and training of electoral staff.⁷⁴ Despite these challenges there was reasonable calm because the major political parties were committed to peaceful elections.⁷⁵ This demonstrates that it is not the systems themselves that erode democratic principles but the political behaviour of those who are participating. When Raila Odinga raised concerns of unauthorised access by the Kenyatta regime to manipulate technology systems, the 2017 election results were nullified by the court.⁷⁶ Following the court order, presidential elections were rescheduled.⁷⁷ Against these advantages of e-voting, there was a political will to meet the gender quota as provided by the institution. Therefore the sensitivity to pro-gender provisions paved a way for e-voting technologies and their ability to promote women participation.

3.0 GAPS IN EXISTING LAWS AND POLICIES CONCERNING INTEGRATING SUSTAINABILITY.

A combination of e-voting technologies and manual voting systems generated electoral outcomes which legitimised more political power for Kenyan women. Between 2013 and 2017, a number of women in the senate and national assembly doubled. In 2022, twenty three percent of women made it to parliament and thirty-one percent became senators. These have been sustained by national frameworks encouraging the participation of women in electoral processes.

⁷⁴ George Okong'o and Nicholas Matatu, 'Kenya: The Potential and Limitations of Electoral Technology', (*IDEA*, 27 September 2017) <<https://www.idea.int/news/kenya-potential-and-limitations-electoral-technology>> accessed 23 September, 2024.

⁷⁵ Institute for Security Studies, 'A Review of Kenya's 2013 Elections', (*ISS*, 20 March 2013) <<https://isafrica.org/events/a-review-of-kenyas-2013-elections>> accessed 19 August, 2024.

⁷⁶ Justin Lee, 'OT-Morpho denies claim Kenyan Biometric Voting System was Hacked', (*Biometric Update*, 19 September 2017) <<https://www.biometricupdate.com/201709/ot-morpho-denies-claim-kenyan-biometric-voting-system-was-hacked>> accessed 21 July 2024.

⁷⁷ Ken Mutuma, 'Kenya's Annulled Presidential Election: A Step in the Right Direction?', (2021) 35 (1) *Speculum Juris* 91.

While it is clear that Kenya has made significant strides to achieve gender parity and that it has contributed positively to women participation in AI-induced technologies, the structural and social constraints are still deeply embedded in electoral processes. Women are still marginalised by uneven power relations, limited education, patriarchal norms, and ownership of resources. As result they are vulnerable to compromised regulatory gaps, skills gaps, and lack of investment in research.

There is still lack of legal frameworks to reinforce security of e-voting technologies. The Data Protection Act continues to be threatened beyond the 2022 general elections with attempts to remove it. Biometric technologies have also increased unwarranted surveillance, there are no supporting laws to regulate facial recognition systems which can be misused to negate civil rights. Invasion of security encrypted into e-voting, exposes women to volatile environment between and during elections when their personal information is being accessed by those intending to suppress their participation. As already indicated, like manual voting systems, e-voting can be manipulated by those with access to them. These manipulative tendencies, structural inequalities and lack of legal frameworks mirrored historical legacies which have been detrimental to the participation of women in elections. Antagonistic behaviour towards Kenyan women has been greatly perpetuated in the absence of competent AI management strategies.

Operational deficits like power outages, and poorly trained workforce contributed to system failures and were more severe in rural areas during the 2013 general elections and were not so much about the failures of technology, but rather projections of managerial limitations. There were raised concerns of access inequalities and the digital divide which disadvantaged Kenyan women especially those in the rural areas. Again, it exposed Kenyan women to long queues, still making “time tax” a recurring feature of the electoral processes. Given the realities of energy poverty in the context of African elections, the IEBC has inadequately committed to power security during elections.

Asymmetrical power relations in the AI-generated networks favour those with access to state resources. Women generally account for a minimum ownership of servers used in electoral processes. Low number of Kenyan women in policymaking and the digital space, disempower them to encourage transparency in the AI ecosystem. The impact of AI on African elections is shaped by ownership of technological infrastructure. During the 2017 elections, organised stakeholders coined the Swahili phrase, 'Fungua server' directly translated as 'open the server'. They demanded the IEBC to 'open the servers' for verification of ballot papers. This shows that there are deeply rooted insecurities in voting technologies. Furthermore, since Kenyan women have less access to political networks, they have also become further from policy processes concerning technical considerations of voting technologies and a very insignificant number of Kenyan women in the development of AI and machine learning. This hinders their knowledge and control over technical aspects of e-voting systems.

Cheeseman and Kamencu (2024) cautioned that while structural changes in the Kenyan political landscape have positively affected democratic processes, inter-group factions, clientelism and ethnic fidelity still sustain political networks. Since, e-voting is affected by trust as one the key factors affecting adoption and acceptance, a political landscape still marred by ethnic and political tensions has the potential to incite conflicts concerning the legitimacy of electoral outcomes emanating from e-voting systems. In the electoral space, these can also be brought to surface in the absence of political will to genuinely emancipate women.

Unilateralism in key decision-making processes undermines inclusiveness required to operate and validate data emerging from e-voting technologies. While the laws may be adequate, there are still tendencies to exercise unilateral decisions. During the 2022 elections, the chairman of the IEMB, Wafula Chebukati, announced the final results which were disowned by other commissioners. Although the court still ruled that William Ruto had achieved victory, it raised questions not only about the tallying processes but resources including e-voting technologies. Given that Kenyan women have long been subjected to

these unilateralism decisions, their confidence in the very resources used at the time of electoral reforms declined.

Given the technical hiccups of electronic verification 2013, the IEBC reverted to manual systems. As already discussed, the manual systems had significantly undermined women's participation in previous elections. Without political commitment to credible elections and the protection of human rights, there is a possibility that contingency arrangements to support e-voting systems may undermine democratic principles.

William Ruto's victory in the 2022 elections symbolised a new era in Kenyan politics with potential to erode tribal, dynastic and ethnic politics, experiences of voters and candidates during elections from 2013 to 2022 proved that these historical legacies are still eroding Kenya's democracy. While there are well-meaning efforts to encourage ethnic tolerance in elections, the rapid advances of the entire AI ecosystem have presented opportunities for the general public and other stakeholders to interact with developing technologies during elections. Although social media technologies are detached from the actual voting technologies, they can be used to disseminate hate speech and keep women from e-voting systems. The surge of deep fakes and cyber bullying indicate that there is continuous weaponisation against women in politics carried over to social spaces. E-voting relies on the digital storage of voters and candidates' personal information which can be retrieved upon request for identity verification purposes. Without strong AI regulations in the e-voting systems, personal information can be filtered into social media domains. It is for this reason that the entire AI ecosystem should be gender sensitive and guarded by robust policies during and in between elections.

4.0 LEGAL APPROACHES FOR ADDRESSING THE CHALLENGES OF E-VOTING TECHNOLOGIES AND KENYAN WOMEN'S PARTICIPATION

Poor implementation of voting technologies has adverse effects on the future participation of women. While government has made significant strides to promote endurance of e-voting technologies and sustainable participation of women, literature has indicated that e-voting systems are prone to technical and political issues. As a result, there is tendency to revert to a political climate which does not support e-voting technologies and Kenyan women's participation in elections.

With regards to power outages, there should be policies reinforcing energy solutions during elections. This would ensure that women are not enduring anxieties associated with long queues due to power outages hindering functionality of e-voting technologies. The controversy concerning the declaration of results whereby a commissioner announced electoral outcomes unilaterally exposed inconsistencies of the IEMB executive personnel. Unilateralism in the IEBC may deter Kenyan women's confidence in electoral processes as it has previously marginalised them from participation. Given that conflicts have previously arisen from declaration of results, it remains critical commissioners of the IEMB work collectively during tallying processes to identify inconsistencies with data deriving from e-voting technologies.

Knowledge systems are critical to encourage continuous improvement of e-voting technologies. Although there are general reports highlighting women's marginalisation from e-voting technologies, the IEBC should in collaboration with government agencies generate county specific gender audits to determine unique challenges to a particular region. AI literacy should be nationalised with programmes tailored to complement component of cultural diversity.

The country will need to invest in continuous education programmes so as to fully capacitate the workforce. As argued by Ondiek and Onyango, policies in Kenya's AI ecosystem should recognise the fact that although

technologies are able to exercise a certain degree of autonomy, human input is still indispensable to their functionality. These key areas include the ability to create codes, protect servers and digital registers. Policies on ethics should also be prioritised to ensure compliance with data management. It should be mandatory that the technology suppliers, controllers and IEBC workforce are all trained and updated on ethical considerations. This is also aligned to the Kenya Artificial Intelligence Strategy 2025-2030 which identifies ethical considerations as a strategic theme.

Late procurement of voting technologies without clear policy direction on how transparency should be achieved restricts adequate implementation. As a result, the sustainability of electoral justice can be compromised by poorly trained workforce. Given rapid upgrades of technology, government should commit to early procurement so as to suffice time for adequate training.

Rapid technology innovation should unlock potential for multiculturalism and multilingualism in e-voting technologies. Generally, in the African context, e-voting systems are not also achieving maximum functionality because they are programmed in languages foreign to the voter population. As in the case of the United States, e-voting technologies could be modified to cater for local context without deviating from common principles. The Kenyan government needs to customise e-voting technologies to ensure endurance of diversity. These innovations would reinforce social cohesion, not only amongst women but the general public.

If e-voting technologies are to be sustained and inclusive, government should incentivise education for women to fully participate in the development of software programmes. There are concerns of gender disparity in Kenya's science, technology, engineering and mathematics (STEM) participation. Some of these concerns the exclusion of women from science programmes during pregnancy. As a result, women take longer to complete their studies. There should be deliberate efforts to remove gender biases and improve women's rights to science education.

Universities admitting female students for science programmes should be transformed by gender-friendly policies to cater for unique challenges for female students. Without these structural changes in other sectors, women will not have the competitive advantage in technology innovation responsible for e-voting technologies. Progress in this area will also enable Kenyan women to meet SDG 4 which aims for inclusive and quality education.

Considering that Kenya has accounted for high expenditure on e-voting technologies and is pressured to make financial cuts in other critical sectors, it makes it even more necessary for Kenyan government to be more in-ward looking for long-term solutions. The fact that there are fiscal cuts in other critical sectors, implies that women's services and development will inevitably become compromised. Women should be part of endogenous solutions so that government does not spend money on external sourcing of e-voting technologies. Again, sustainability of national resilience in technology become imperative if Kenya is to fully migrate to e-voting technologies. This calls for more work on SDG 17 which prioritises partnerships in science and technology. The IEBC should invest in long-term partnerships with other electoral bodies in the region for peer learning on electoral financing.

Beyond the 2022 elections, e-voting technologies can also persevere when there is tolerance for political dissent. While the judiciary has exercised remarkable autonomy, Kenya and many other east African countries are still entrenched in hostile political spaces. Nicknamed 'Abductistan', the Kenyan government continues to rule with brute resulting in the disappearance of citizens who have shown dissent to government. Citizens experience assault and kidnapping incidents. Beyond polity women continue to experience the scourge of femicide. Literature has pointed out to the importance of a conducive climate for e-voting technologies to enable electoral sustainability. Prone to these abusive behaviours, women are more likely to refrain from political participation even when technologies carry potential to sustain electoral integrity. It remains very urgent that structural transformation uproots the hostilities of Kenya's deeply divided political landscape. Kenya

Vision 2030 calls for security, policy, legal and institutional reforms. It calls for policy reforms and the finalisation of the hate speech bill, review of the Freedom of Information bill. These policy reforms should be realised. There should be enactment of National Cohesion and Integration Act of 2008 in electioneering so as to enable social cohesion. Even with its advantages, e-voting technologies cannot on its own secure participation of women.

There should immense investments in special investigation of AI gender-based threats. Security agencies should be adequately trained on ethical consideration and the need to uphold gender mainstreaming during electoral processes. National security should be fully committed to because Kenyan women will also benefit from safer spaces.

5.0 CONCLUSION

E-voting technologies carry potential to promote electoral integrity and the participation of women in Kenyan elections. Historical perspectives on Kenyan women's participation in election revealed poor compliance with democratic principles. Prior to constitutional reforms and establishment of SDGs, Kenya's electoral landscape was largely consumed by patriarchy, ethnic cleavages, and asymmetrical power relations. However, reforms ahead of using e-voting technologies, enabled progress towards sustainable elections. With the rapid expansion of the AI technologies, political power relations, patriarchy and ethnic cleavages are taking centre stage in other virtual domains. This is due to weak legalisation of the entire AI ecosystem. Electoral sustainability is highly sensitive to other social and cultural issues and can only be achieved when there is political will to genuinely steer transformation across the entire public administration. These misfortunes are reversing Kenya's efforts to reinforce SDG goals. E-voting solutions are certainly going to feature in many of Africa's relations. However, it is up to governments and constituents to ensure that pro-gender policies are implemented to ensure that women can actively participate in the upcoming election.