

INTEGRATING **WOMEN**
IN THE UPTAKE OF
ELECTRIC MOBILITY
FOR THE TWO AND
THREE-WHEELER
SECTOR



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ABBREVIATIONS AND ACRONYMS

| | |
|-----------------|--|
| CBD | Central Business District |
| CIDPs | County Integrated Development Plans |
| CEDAW | Convention on Elimination of all Forms of Discrimination against Women |
| CO ₂ | Carbon Dioxide |
| CO | Carbon Monoxide |
| CoK | Constitution of Kenya (CoK) |
| EMCA | Environmental Management and Co-ordination Act. |
| ERC | Energy Regulatory Commission |
| FGD | Focus Group Discussion |
| GDP | Gross Domestic Product |
| GFEI | Global Fuel Economy Initiative |
| GHG | Greenhouse Gases |
| GIZ | German International Cooperation |
| GoK | Government of Kenya |
| HIV | Human Immunodeficiency Virus |
| HC | Hydro Carbons |
| ICE | Internal Combustion Engine |
| ICT | Information and Communications Technology |
| ILO | International Labor Organization |
| ISO | International Standards Organization |
| IMT | Intermediate Modes of Transport |
| KBS | Kenya Bureau of Standards |
| KI | Key Informant |
| KNBS | Kenya National Bureau of Statistics |
| LBDA | Lake Basin Development Authority |
| LDV | Light Duty Vehicles |
| MAAK | Motorcycle Assemblers Association of Kenya |
| MTPs | Medium -Term Plans |
| NDC | Nationally Determined Contribution |
| NMT | Non-Motorized Transport |
| NO _x | Nitrogen Oxides |
| NTSA | National Transport and Safety Authority |
| RESS | Rechargeable energy storage system |
| SACCO | Savings and Credit Cooperatives |
| SDG | Sustainable Development Goals |
| SSA | Sub-Saharan Africa |
| STEM | Science Technology and Mathematics |
| STI | Sexually Transmitted Infections |
| UDHR | The Universal Declaration of Human Rights |
| UNEP | United Nations Environmental Programme |
| UNESCO | The United Nations Educational, Scientific and Cultural Organization |
| WHO | World Health Organization |

EXECUTIVE SUMMARY

This study focused on “Integrating women in the uptake of electric mobility for two and three-wheeler sector. The study sought to examine gender dimensions in the 2/3 wheelers in Kenya, existing policy gaps and available opportunities for leveraging women/girls’ uptake in electric mobility in Kenya, particularly in the 2/3-wheeler sector. The study was conducted in Nairobi, Mombasa, Kisumu. Convenient sampling was used to reach 1184 respondents: 478 male riders, 60 female riders, 423 female commuters, and 223 women in the auxiliary services (mechanics, car wash, courier services, and those selling wheelers accessories such as spare parts.

The findings of this study established that the female gender is under-represented (11%) compared to (89%) male representation in the two and three-wheeler sector. Manufacturing and assembling of 2/3 wheelers are also male-dominated. The Majority (86%) of two and three-wheelers were aged between 18 and 39 years. Out of the 60 female -riders who took part in the survey, 72% specialized in two-wheelers while 28% specialized in three-wheelers. One of the reasons established by the study for the low involvement of women in the sector was attributed to the harsh working environment prevalent with sexual harassment. The majority (66%) of female commuters had experienced verbal harassment, while (21%) had experienced physical harassment. The culture of impunity, and inadequate enforcement of the law and that would provide adequate safeguards for women/girl’s engagement are hardly implemented.

This study also established that women lack adequate time to venture into the two and three-wheelers since gendered roles require them to perform most of the domestic work, including cleaning, cooking, and taking care of children, limiting their time required for one to succeed in the sector. The lack of awareness of e-mobility affordability, and efficiency, in addition to inadequate availability of charging stations is inhibiting the uptake of e-mobility in the 2/3 e-wheelers in the study regions. On the other hand, environmental friendliness and renewable clean energy were the most desirable attributes of the e-mobility uptake for 2/3-wheeler sector.

It can be noted that there is already a base anchored by enabling national policy and legal frameworks for mainstreaming gender in all sectors including the 2/3 wheelers. However, on overall, the transport policies and legal frameworks fail to recognize explicitly gender-specific issues like gender-differentiated transport and mobility patterns.

Policy recommendations include: There is need for a comprehensive gender audit in the industry and a specific policy that guides how the sector can be inclusive where women can meaningfully participate and feel safe. To this effect, social or gender experts should be actively involved not only in policy formulation but also in its implementation and monitoring.

Government should provide more security in transport terminals where motorcycle taxis and tuk-tuks drop and pick-up passengers/ commuters; safeguarding and self-protection measures; there is need to establish motorcycle taxis exclusively for women and/or driven by women; enforcement of law and introduction of tougher penalties for abuse targeted towards women in the 2/3 wheelers, particularly verbal and sexual abuse.

For the private sector, there is need to provide incentives like tax rebates or waivers for equal work for male and female employees in the 2/3-wheeler sector. There is need for donors to provide grants, fellowships, and scholarship programs to help encourage more women professionals into the public transport industry, and also provide technical support to government, private, and public sectors on the adoption of e-mobility. Academic institutions on the other hand should adopt affirmative action in the selection of girls in STEM programs as a way of improving women/girls’ capabilities in renewable energy engineering, manufacturing, and auxiliary services value chains.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background of the Study



Globally, rapid urbanization has continued to exert pressure on transport infrastructure, with the continuous increase in population¹. Historically, transport movements within cities tended to be restricted to walking, which made urban mobility challenging, and time-consuming. A study by Keto (2011) on Global Environmental Change noted that the sprawling global urban cities have inherited an urban transportation form, created under the historical circumstances, which are no longer prevailing². Globally, the majority of urban residents have relied on walking and public transport, both motorized (for example buses, sub-ways, and boda-boda motorcycles in Africa) or non-motorized (for example rickshaw taxis in Asia, and boda-boda bicycles in Africa). Analysis by World Bank (2018)³ shows that women in the transport-mobility sector are higher in the developed world with a median of 23%, while developing countries have female workers representation with a median of 8%, with Sub-Saharan Africa having a median of (5%).

The Asian Development Bank (2013)⁴ gender tool kit in the transport sector highlights the disproportionate access and integration of women into the transport sector. The report notes that men are more likely to own or know how to drive motor vehicles and more likely to have access to a cash income and control over family finances to afford and to pay for public transport. As women have primary domestic and caregiving responsibility in families, this provides men with more time to travel outside the home for further distances and to have overall greater mobility. In addition, where women do use vehicles or transport services, they are more heavily reliant on slower, nonmotorized transport (NMT) or intermediate modes of transport (IMTs, such as bicycle, cyclo, motorbike-taxi, (boda-boda), and tricycle (such as tuk-tuks), and rickshaws⁵. In urban areas, this usually translates to women being more dependent on public transport.

Two and three-wheelers are the fastest growing transport mode in many low and middle-income countries⁶. Currently, about 270 million motorcycles are on the road with annual motorcycle sales accounting for about 52 million⁷. It is projected that by 2050, the global fleet of motorcycles is projected to account for more than 400 million, which will represent a 50% increase, with most being electric mobility (using a battery instead of fuel). In Sub-Saharan Africa (SSA) the evolution from high-occupancy public transport to smaller demand-responsive is largely driven by affordability, access, and the need to avoid long hours of traffic congestion that creates inefficient mobility options⁸. Despite this growth,

Energy Regulatory Commission (ERC) in 2015⁹ notes that motorcycle engines contribute to poor engine emissions. The two-stroke exhaust is packed with oxides of nitrogen, oxides of Sulphur, hydrocarbon, and fine particles all of which are toxic contributors to air pollution and are detrimental to public health. Hydrocarbon emissions from motorcycles are higher (0.24g/km)¹⁰ compared to (0.019g/km petrol) and (0.003g/km diesel)¹¹ vehicles.

The Kenya Population Housing Census of 2009 indicated that by 2009, 24.3% of Kenyan households owned bicycles, 2.3% owned motorcycles, while 5.5% owned either a tuk-tuk or a private vehicle¹². In the years following the 2009 census, motorcycles transport (boda-boda) has become an all-important mode of public transport due to its accessibility, flexibility, availability, and maneuverability¹³. The total registered vehicles for 2013 were reported to be 2, 011,972 (out of which, 962, 000 (48%) were light vehicles, 738,219 (37%) were two, and three-wheelers). The registration of the wheelers has surged exponentially following the government decision to zero-rate the imported wheelers below 250cc. By 2019, a total of 1,294,980 were registered as two-wheelers (with 195,253 being registered in 2019 alone). Similarly, the three-wheelers increased from 134 in the year 2004 to 37,535 in Kenya by the year 2018¹⁴.

¹Mulley, C. (ed) (2013). Urban Form and Transport Accessibility, Cheltenham, UK: Edward Elgar.

²Seto, K.C. (2011) "Exploring the dynamics of migration to mega-delta cities in Asia and Africa: Contemporary drivers and future scenarios", Global Environmental Change. 21(S1), pp. S94-S107

³World Bank (2018). Global Roadmap of Action Toward Sustainable Mobility: Gender <https://thedocs.worldbank.org/en/doc/229591571411011551-0090022019/original/GenderGlobalRoadmapofAction.pdf>

⁴ADB (2013): Gender Tool Kit: Transport Maximizing the Benefits of Improved Mobility for All

⁵Ibid

⁶See: UNICEF (2020). Electric two and three wheelers: Available at: <https://www.unep.org/explore-topics/transport/what-we-do/electric-mobility/electric-two-and-three-wheelers>

⁷Ibid

⁸World Bank (2020). Gender in urban transport in Nairobi, Kenya. Volume 1: Mobility

⁹ERC (2015). Report on Global Fuel Economy Initiative study in Kenya (GFEI). Available at http://epra.go.ke/wp-content/uploads/2018/05/gfei_final_report_april_2015.pdf

¹⁰See: <http://at.eng.auth.gr/copert>

¹¹ <http://liftshare.com/content/stats.assumptions.asp>

¹²Kenya National Bureau of Statistics, 2009

¹³Nyachieo (2015). Socio-cultural and economic determinants of boda-boda motorcycle transport safety in Kisumu County, Kenya;

¹⁴Tunje, S & Yogo, K. (2020). Using Motorized Two and Three-Wheeler Transport to Enhance Youth Employment in Kenya: A Descriptive Approach. <http://repository.kippra.or.ke/handle/123456789/2522>

1.2 Statement of the Problem

Two and three-wheelers are associated with crash fatalities and injuries, they provide a solution to mobility and accessibility especially to poorly networked areas. However, their growth has been attributed to the flexible, timely, and convenient transport services they offer to commuters¹⁵. Mobility and access anchored on efficient, safe and sustainable transport has become important in the advancement of social and economic development, necessitated by the need to have safer, healthier, and environmentally sustaining mobility¹⁶. However, a study by Flone Initiative (2019) on three-wheeler operators in Mombasa established that 96% of operators were male, against a paltry 4% female. If well harnessed, the 2/3 sector can provide a valuable means of transportation and investment opportunity for women. The study was corroborated by Porter (2011) that indicated there exists inadequate protections and enforcement of two-and three-wheeler motorcycles make it difficult for female operators to compete effectively with the ir male counterparts.

These findings are consistent with international research that shows that reasons for lower rates of cycling amongst women include: greater domestic responsibilities (Emond et al.,2009, Steinbach et al., 2011); greater vulnerability to and fear of street violence (Frater and Kingham, 2018, Ravensbergen et al., 2020, McCullough et al., 2019); being less likely to be taught cycling skills; lower levels of perceived self-efficacy with negotiating traffic (Emond et al., 2009, Félonneau et al., 2013); difficulties achieving cultural expectations of feminine dress and behavior while cycling.

As such, despite the growth of two and three-wheelers in Kenya, women are disproportionately represented or integrated into the transport sector, which exposes them to socioeconomic disadvantage and poverty¹⁷. The increase in the adoption and usage of two and three-wheelers provides an opportunity for integration of women in the transport sector in Kenya, particularly, the two and three-wheeler electric mobility, which forms the basis of this study¹⁸.

1.3 Study Objectives - The objectives of this study are:

1.

To establish gender dimensions in the two and three-wheeler mobility in Kenya

2.

To identify gaps/opportunities, where integrating gender into two and three-wheeler sector in Kenya would result in wider uptake of electric mobility

3.

Identify policy gaps to support wider uptake of electric mobility in Kenya given gender-considerations.

1.4 Study Report Structure

This report is presented in the following manner. Chapter one highlights the background of the study, which covers the global and historical perspective of women in the transport sector, and the adoption of two and three-wheelers, including related challenges. The chapter also presents the statement of the problem and the objectives that guided this study. Chapter two focuses on the literature review, which covers gender representation in the two and three-wheeler transport sector, and socio-economic opportunities. Chapter three focuses on legal and policy frameworks and regulations. Chapter four highlights the methodology adopted, which includes the study design, sample size and sampling technique, data analysis, and presentation and limitation of the study. Chapter five presents the results and findings, discussions, and recommendations.

¹⁵Afukaar, Damsere, Peter & Starke (2019) Rural Transport Services Indicators: Using a new mixed-methods methodology to inform policy in Ghana

¹⁶Siemens Stiftung (2020). E-Mobility solutions for rural Sub-Saharan Africa: Leveraging Economic, Social, and Environmental change

¹⁷ADB (2013). Gender Tool Kit: Transport Maximizing the Benefits of Improved Mobility for All

¹⁸Ibid



CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Understanding the Motorcycle Industry in Kenya

Motorcycles in Kenya can be traced back colonial era, although, they were mostly used by government officials and the elite class. The commercialization of motorcycles (commonly referred to as boda-boda) as a mode of transport can be traced to the border town of Busia between Kenya and Uganda. The name boda-boda was a corruption of the English word “border-border”, which meant, ferrying passengers from one border to the other border between Uganda and Kenya (Malmberg, 1994)¹⁹. Initially, they were used to smuggle goods across Uganda -Kenya border as informal ‘for hire’ transport services for passengers and goods. A study by Mwobobia (2013)²⁰ noted that boda-boda transport has since gained greater and flexible mobility across urban and rural areas in Kenya, just as in Uganda.

Since 2008, there has been an upsurge in motorcycle taxis in Kenya due to the tax waiver provided by the Kenyan government on importation of the same, and the spare parts. The tax waiver was done to promote job creation among the youth in the transport sector (Mutiso & Behrens, 2011)²¹. The Motorcycle Assemblers Association of Kenya (MAAK) notes that in 2015, over 90% of motorcycle /boda-boda were youth operated²². The sector employs over 400,000 Kenyans, who provide livelihood support to approximately 2.4 million²³. According to the National Transport and Safety Authority (NTSA)²⁴ data, the motorcycle future in Kenya seems greener since the sector has started embracing the new technology for electric rechargeable batteries that are environmentally friendly and low-cost in operations.

Despite the growth of the motorcycle within the transport sector, the lack of enforcement of traffic regulations on boda-boda operations has seen a drastic increase in motorcycle-related injuries and death. WHO Motorcycle-related Road traffic crashes in Kenya: Facts and figures²⁵ cited a study conducted in Naivasha hospital that revealed that 36% of patients in the emergency department at Kenya’s hospitals were victims of traffic clashes involving motorcycles, out of which, 75% were reportedly not wearing helmets, despite the NTSA Motorcycle Regulations 2015 making specific stipulations on helmets²⁶.



¹⁹Malmberg, C. (1996) Case study on intermediate means of transport: bicycles and rural women in Uganda. SSATP Working Paper No. 12. The World Bank and Economic Commission for Africa mediation of sex in southwest Uganda. Journal of AIDS Care, vol. 13, No.1, pp. 373-386.

²⁰Mwobobia, B (2013). Critical Success Factors in The Motorcycle Boda-boda Business in Nairobi, Kenya. Master's Thesis, University of Nairobi.

²¹Mutiso, W. & Behrens, R (2011). Boda-boda bicycle taxis and their role in urban transport systems: Case studies of Kisumu and Nakuru, Kenya. Centre for Transport Studies: University of Cape Town

²²MAAK (2015). Motorcycles Assemblers Association of Kenya. Government Press. Nairobi-Kenya

²³Ibid

²⁴NTSA (2014). Comparative Statistics Trends For 2013 and 2014As at 14th September 2014. The National Transport and Safety Authority: Nairobi. Available on:

http://www.ntsago.ke/index.php?option=com_content&view=article&id=213&Itemid=706

²⁵https://www.who.int/violence_injury_prevention/road_traffic/countrywork/factsheet_kenya.pdf

²⁶The National Transport and Safety Authority Act (No.33 of 2012)

2.1 Gender Inclusion in the Two-Wheeler and Three-Wheeler Sector

A 2018 research by Flone Initiative revealed that women formed only 10% of workers in the matatu industry in Nairobi while a 2019 study in Mombasa indicated that women constituted only 4% of the labor force. As a result, it is easy to overlook their specific needs and how these impact on their employment, retention and promotion in the industry.

A study conducted by Nthiiri (2018)²⁷ in Meru County Chuka Municipality established that only 6% of 94 motorcycle respondents operators were female. The low level of female inclusion in the sector in Chuka Municipality was attributed to the perception that motorcycle riding in busy high traffic Kenya urban centers is risky, prone to accidents, injuries, and sexual-related abuses. Women transport workers are highly at risk of experiencing sexual harassment as revealed by a Flone Initiative 2020 study indicating that 79% had experienced some form of sexual harassment while at work. Similar findings had been established by Mutiso and Behrens (2011)²⁸ who looked at motorcycle taxis and their role in urban transport systems in Kisumu and Nakuru counties. In their study, they noted that over and above the inherent risks and injuries associated with motorcycles, cultural gender biases that associate women with domestic work enhance discrimination and exclusion of women in the two- and three-wheeler transport sector in Kenya. The use of two-wheelers among women is deemed inappropriate due to the way passengers are expected to sit and the proximity to the wheeler rider (Porter, 2011, Gillen, 2016) forcing them to ride side-saddle, which is not safe. According to International Labor Organization (2018) study showed that limited access to and safety of transportation was estimated to be the greatest obstacle to women's participation in the labor market in developing countries, reducing their participation probability by 16.5 percentage points²⁹. Sustainable transportation and gender inclusion is a crucial element in enabling women and girls to access to economic and social opportunities, leading to inclusive societies and equitable growth³⁰.

2.2 Socio-Economic Opportunities in the Two-Wheelers and Three-Wheelers Sector

The two and three-wheeler transport sector has emerged as a leading source of informal employment to the youth, with the majority operating as riders³¹. The sector has significant potential in mitigating youth unemployment. This is due to its ability to create jobs for skilled, semi-skilled, and unskilled individuals. The two and three-wheelers consist of essential nodes that link areas and travel routes that cannot be accessed by other means of motorized transport³². As such, the ease of accessibility, maneuverability, and end point connectivity of the two and three-wheelers has enhanced acceptance as the alternative means of transport. As discussed earlier, the two and three-wheeler value chain creates opportunities for value addition at various levels such as the sea port and inland port, assembly and manufacturing plants, wholesale and retail, operation, repairs, and disposal. So far, the operation node provides the highest number of job opportunities as one two-wheeler directly employs one individual for operating while a three-wheeler employs at most two direct jobs for operation. The sector employs over 400,000 Kenyans, who provide livelihood support to approximately 2.4 million³³.

According to data from the statistical abstract from the Kenya National Bureau of Statistics (KNBS, 2019)³⁴, the manufacturing node of the two- and three-wheeler sector employs more than 3,001 individuals. Additionally, the wholesale and retail nodes of the two and three-wheeler employ a total of 9,206 while repair and maintenance employ 36,799 skilled and semiskilled employees. Based on this data, it is evident that the sector has high growth potential. The workers' productivity wage rate has continued to increase by around 1.03 percent annually between Ksh 30 to Ksh 156 (\$0.27 to \$1.43) as per 2019 data. On manufacturing revenue of the two- and three-wheeler sector, there has been positive growth in revenue from Ksh 761.5 million (Approx. \$7 Million) in 2014 to an estimated Ksh 990.0 million (Approx. \$9.08 million) in 2018, while sales both wholesale and retail have increased from Ksh 3,305.8 million (Approx. 30.3 million) in 2014 to an estimated Ksh 4,808.5 million (Approx. \$44.11 million) in 2018³⁵. Similarly, the repair and maintenance of motor vehicles and two and three-wheeler sector increased from Ksh 9,856.0 million (Approx. \$90.42 million) in 2014 to an estimated Ksh 16,041.7 million (Approx. \$147.17 million) in 2019³⁶.

The continuous expansion of the two- and three-wheeler sector presents multiple opportunities for both skilled and semi-skilled individuals, that can be exploited in a gender-inclusive manner.

²⁷Boda Boda Business and Youth Empowerment in Kenya, A Case of Boda Boda Operators in Chuka Municipality. Available at: <https://core.ac.uk/download/pdf/224836729.pdf>

²⁸Mutiso, W. & Behrens, R (2011). Boda boda bicycle taxis and their role in urban transport systems: Case studies of Kisumu and Nakuru, Kenya. Centre for Transport Studies: University of Cape Town,

²⁹International Labor Organization (2018), Women and men in the informal economy: A statistical picture

³⁰World Bank Gender Equality Brief May 2018 Conclusions p 18. [https://openknowledge.worldbank.org/bitstream/handle/10986/29865/126579-Public-on-5-](https://openknowledge.worldbank.org/bitstream/handle/10986/29865/126579-Public-on-5-30-18-WorldBank-GenderEquality-Brief-v13.pdf?sequence=1&isAllowed=y)

³¹Tunje, S & Yogo, K, (2020). Using Motorized Two and Three-Wheeler Transport to Enhance Youth Employment in Kenya: A Descriptive Approach

³²Ibid

³³MAAK (2015). Motorcycles Assemblers Association of Kenya. Government Press. Nairobi-Kenya

³⁴Kenya National Bureau of Statistics - KNBS (Various). Statistical Abstract. Nairobi: Kenya National Bureau of Statistics

³⁵Kenya National Bureau of Statistics - KNBS (Various). Statistical Abstract. Nairobi: Kenya National Bureau of Statistics

³⁶Ibid

CHAPTER THREE

3.0 GENDER POLICY AND LEGAL FRAMEWORK

3.1 International, Regional, and National Legal Frameworks

Since the promulgation of the Constitution of Kenya (CoK) 2010, Kenya has been at the forefront in the efforts to eliminate all forms of gender discrimination in all sectors of socioeconomic development, including at the workplace. The constitution provides that all international and regional Conventions, Treaties, legislative and policy frameworks adopted and ratified by Kenya, shall become part of the domesticated laws of Kenya, and be used for gender equality, protection, and enjoyment of inalienable human rights³⁷.

Table 1: Summary of International Legal Instruments

| Treaty /Convention | Status |
|---|-----------------------------|
| <p>The Universal Declaration of Human Rights (UDHR) is an international document adopted by the United Nations General Assembly that enshrines the rights and freedoms of all human beings under UNGA Resolution 217 on 10 December 1948. The Declaration consists of 30 articles detailing an individual's "basic rights and fundamental freedoms" and affirming their universal character as inherent, inalienable, and applicable to all human beings. The UDHR commits nations to recognize all humans as being "born free and equal in dignity and rights" regardless of "nationality, place of residence, gender, national or ethnic origin, color, religion, language, or any other status"³⁸.</p> | Ratified on July 31st, 1990 |
| <p>Convention on Elimination of all Forms of Discrimination against Women (CEDAW) was established in 1979. The CEDAW Committee adopted General Recommendation No 19 on violence against women in 1992. According to this document, the definition of discrimination includes gender-based violence, that is, violence that is directed against a woman because she is a woman or that affects women disproportionately. It includes acts that inflict physical, mental, or sexual harm or suffering, threats of such acts, coercion, and other deprivations of liberty.</p> | Ratified 9th March 1984 |
| <p>The 1995 Beijing Platform for Action (BPFA) flagged 12 key areas where urgent action was needed to ensure greater equality and opportunities for women and men, girls and boys. It also laid out concrete ways for countries to bring about change. In 2014 the CEDAW committee established the BPFA five-year action plans to which countries are to report on the status of gender equality. The latest BPFA +25 was conducted in 2020 where Kenya reported on progress and opportunities for women and girls.</p> | Ratified 1996 |

(Source: Kenya Law Reform)

These policy regulations generally seek to promote the empowerment of women in all spheres of life. However, it is of necessity that the regulations are enforced in the public transport industry and specifically the male dominated 2/3 wheeler sector where women have experienced cases of gender based violence. The critical areas of concern where girls and women require differential treatment including; access to education and training and involvement in decision making on resource management. Participation of all stakeholders including men as well of change of attitudes should be stressed to eliminate the gender disparities in the public transport industry.

³⁷Article 2(5) and (6) provides that the general rules of international law as well as any, treaty or convention ratified by Kenya form part of the law of Kenya
³⁸ <https://www.ohchr.org/EN/UDHR/Pages/UDHRIndex.aspx>

Table 2: Summary of Regional Legal Instruments

| Treaty /Convention | Status |
|--|-----------------------|
| African [Banjul] Charter on Human and Peoples' Rights is an international human rights instrument that is intended to promote and protect human rights and basic freedoms in the African continent. It was adopted on November 2, 1987, in Addis Ababa, Ethiopia | Accession 23 Jan 1992 |
| African Charter on Human and Peoples' Rights on the Rights of Women in Africa (Maputo Protocol) in 2003. Article 4 entirely focuses on the topic of violence against women, calling for a range of state measures to address the violence that takes place "in private or public", including the punishment of perpetrators, the identification of causes of violence against women, and the provision of services for survivors ³⁹ . | Ratified 2010 |

(Source: Kenya Law Reform)

It should be emphasized that human rights and basic freedoms apply in matters of social economic participation in the public transport industry where women are exposed to gender stereotyping and discrimination. Specific attention should be paid to social justice within the 2/3 wheeler sector.

These policies have been ratified and reinforced by an enabling legal framework in Kenya. However, measures for reporting, documenting evidence and redressing violence against women should be improved to ensure prompt and effective dispensation of justice.

Table 3: Summary of National Legislative Frameworks on Gender Equality and Inclusion

| Treaty /Convention | Status |
|--|---|
| The Constitution of Kenya 2010 | Provides that every person has right to freedom and security of their person which includes the right not to be subject to any form of violence from either public or private sources, any form of torture whether physical or psychological or cruel, inhuman or degrading treatment. The right to security means that the Constitution safeguards everyone's right against SGBV and any other related form of gender-based violence |
| The Sexual Offences Act, 2006 | Provides for prevention and the protection of all persons from harm from sexual acts and access to justice and psychosocial support |
| HIV & AIDS Prevention and Control Act 2006 | Prohibits deliberate transmission of HIV/AIDS and outlaws' discriminatory acts and policies based on one's HIV status in all places and safeguards' the rights and dignity of those already affected |
| National Policy on Gender and Development (2019) | Makes recommendations on diverse issues gender equality in access to education, labor and work, health care, environment and natural resources, respect for all, access to justice, etc. |
| The Education Gender Policy (2007) | It recommends mainstreaming of policies that address education equality for all at all levels; |

(Source: NGEC- 2017 Model Policy for County Governments)

To protect the rights of every individual especially regarding women's economic participation, there is need to improve on the processing of reported cases of gender based violence and especially sexual harassment. The reporting mechanism should be clear and well publicized with proper / well documented evidence to support cases to and in court in seeking justice. It is also worth noting that the Sexual offenses Act 2006 fails to clearly outline the forms of sexual harassment and specifically in public spaces. Lastly all these policies should be disseminated and enforced to enhance the safety of women in the 2/3 wheeler sector.

³⁹Assembly of the African Union, Protocol to the African Charter on Human and Peoples' Rights on the Rights of Women in Africa, Maputo, 11 July 2003, Article 4

3.2 Policies and Legislations on Electric Mobility in Kenya

Globally, it is estimated that the transport sector that largely depends on fossil fuels contributes approximately 25% of all energy-related CO₂ emissions (Figenbaum & Kolbenstvedt, 2013)⁴⁰. Despite its impact and contribution to the countries' GDP and Transportation has been identified as the main contributor to the challenges of environmental degradation, and climate change, which has necessitated the need for policy and legislative frameworks. Governments across the world have some form of regulations on emissions from the transport sector. Lieven (2015)⁴¹ notes that besides the Greenhouse Gas (GHG), Internal Combustion Engine (ICE) motorized transport also create noise pollution and adverse health effect in urban environments that require policy and legislative mitigation and regulatory measures.

Electric Mobility has emerged as a practical solution in tackling negative externalities caused by GHG and ICE usage⁴². For instance, The Paris Declaration on Electro-Mobility and Climate Change and the "Call to Action" was established to promote electric mobility to help spearhead the achievement of a sustainable transport sector that will be compatible with a lower than 2-degree global warming pathway⁴³.

For instance, in 1999, the Chinese Government established a policy that designated electric two-wheelers as bicycles, which meant that the two-wheelers would not require licensing and registration⁴⁴. The policy further placed a ban on ownership of gasoline motorcycles in urban core centers. This approach allowed the two-wheelers to travel in bicycle right-of-way lanes, making them more popular in Chinese cities.

In Kenya the Global Fuel Economy Initiative (GFEI) study that was conducted in 2014 established that the average of Light-Duty Vehicles (LDV) which includes motorcycles had an average consumption of 7.62L/100 km, emitting an average CO₂ of 181.78g/km throughout the study⁴⁵. The study recommended policy formulation to help phase out motorcycles with two-stroke engines due to high CO₂ e, emissions, and noise pollution. The government of Kenya has also established a raft of measures, policies, and legal frameworks that guide electric mobility adoption. The current policy, legal and regulatory frameworks are stipulated in Tables 4, 5, 6, and 7.

Table 4: Electric Mobility Policy Framework

| Treaty /Convention | Overview/Summary |
|--|---|
| Integrated National Transport Policy, 2009 | This policy proposes the use of lead-free and low-Sulphur fuels. It stipulates the blending of efficient and less polluting fuels. It also provides strategies for dealing with public service vehicles concerning proper maintenance, and air and noise pollution. |
| Energy Policy 2015 | This policy contained specific measures to be undertaken by the government to promote the use of renewable energy to ensure adequate, quality, cost-effective and affordable supply of energy to meet the development needs while protecting the environment. The target of universal access to electricity necessary for electric mobility by 2022 is yet to be achieved. Solar-powered electric motorcycles are also envisaged and encouraged under the policy. |
| National Environmental Policy 2013 | The key policy statement that supports electric mobility suggests the provision of economic incentives for investment in more efficient, clean, and environment-friendly production technologies, and methods for improved productivity and environmental sustainability |

Source: (Authors Compilation)

It is worth noting that all the above policies are instrumental in enhancing environmental health and safety, fuel efficiency and affordability in the 2/3 wheeler sector. This makes the industry friendly and accommodative for women as users and investors and should be harnessed to encourage more women to participate in the industry.

⁴⁰Electromobility in Norway: Express and Opportunities. Research in Transport Economics 50(2015a)29-38

⁴¹Lieven, T. (2015). Policy measures to promote electric mobility – A global perspective. Transportation Research Part A: Policy and Practice, 82, 78-93

⁴²ibid

⁴³Integrating Electric 2 and 3-Wheeler into existing Urban Transport Modes in Kenya: Institutional arrangement and policy implications for electric mobility in Kenya, 2020

⁴⁴Christopher, C., Jonathan, W., & Davis, C.M. (2008). "The Environmental Impacts of E-bikes in Chinese Cities". Working Paper UCB-ITS-WWP-2007-2 April, UC Berkely Institute of Transportation Studies

⁴⁵ERC (2015). Report on Global Fuel Economy Initiative study in Kenya (GFEI). Available at http://epra.go.ke/wp-content/uploads/2018/05/gfei_final_report_april_2015.pdf

Table 5: Legal and Regulatory Framework



| Legal Document | Overview/Summary |
|---|---|
| Constitution of Kenya, 2010 | The constitution provides for mobility as a basic human right. Article 54(1) (c) provides for reasonable access to all places. Chapter 5 (Part 2) provides a clear outline of the state’s obligation concerning the environment. The Chapter seeks to eliminate processes and activities likely to endanger the environment. |
| Traffic Act CAP 403 2017 | The Act stipulates regulations and characteristics of motorcycles, operations, registrations, and requiring them to be governed by Legal Notice No. 19 of the National Transport and Safety Authority (Regulation 15). This includes: “ensure that no modifications to the exhaust system or any other noise abatement device of a motorcycle are done to cause the noise emitted by the motorcycle to be above that emitted by the motorcycle as originally manufactured. |
| County Government Act, 2012 | Transport within the Counties is a devolved function. County Governments regulates the commercial use of 2 & 3 wheelers in their respective jurisdictions. The County Governments are thus expected to designate operational areas of boda-bodas including designating picking and dropping points, charge parking, and operational fees. Counties are required to control air pollution, noise pollution, and other public nuisance, which could encourage the adoption of electric mobility that is environmentally friendly. |
| Environmental Management and Co-ordination Act, 1999 (EMCA, 1999) & Relative Amendment Act No.5 2015. | The Act requires the standards and enforcement review committee to recommend guidelines to minimize emissions of greenhouse gases and identify suitable technologies to minimize air pollution, Section 57 of the Act allows for the proposal of fiscal incentives, disincentives, or fees to promote the prosperous management of the environment. Including customs and excise waiver in respect of imported goods such as electric motorcycles, spare parts, tax rebates. Penalties and fees may be levied to discourage the use of internal combustion engine motorcycles |
| Excise Duty Act No. 23 of 2015, Revised 2017. | The Finance Bill of 2019 has proposed a reduction on the excise duty for electric vehicles from 20% to 10%, which provides a good incentive for importation and use of electric motorcycles. |
| Energy Act, 2019 | The Act has established several new ‘energy sector entities ‘such as geothermal, solar, wind, rechargeable batteries, etc., which will aid in fast-tracking the adoption of electric mobility. |

Source: (Authors Compilation)

The above policies are aimed at creating an effective, efficient and generally enabling operational environment for the public transport industry including the 2/3 wheelers sector. With such provisions the sector is likely to be favorable to women especially as investors. However, policy provisions that enhance access to credit facilities should be included and stressed since many women have limited control over resources required for collateral necessary for securing loans for investment.

Table 6: National Action Plans, Strategies and Blue Prints

| National Action Plans, Strategies, and Blue Prints Documents | Overview/Summary |
|---|--|
| Vision 2030 | This is the Kenyan development blueprint. It is aimed to lift Kenya to middle-income status over the next decade and helping millions of Kenyans out of poverty. The vision is implemented through series of Medium-Term Plans (MTPs). Infrastructure development is very central with the transport sector playing a key role in economic growth. |
| Kenya National Energy Efficiency & Conservation Strategy 2020 | The Strategy focuses on improving energy efficiency will help reduce the demand for fossil fuels and related greenhouse gas emissions. It will also enhance the potential of renewable energy sources to meet a larger portion of the country's energy needs and its contribution to achieving the Paris Agreement and Sustainable Development Goal 7. |
| National Climate Change Action Plan 2018-2022 | Action Plan provides a mechanism for adoption of climate-proof energy and transport infrastructure; encourage electricity supply based on renewable energy and develop sustainable transport systems which encourage adoption of electric mobility as a way of reducing GHG emissions to 1.82 MtCO ₂ e by 2022. |

Source: (Authors Compilation)

It is worth noting that the above strategies and blue prints are a step in the right direction towards creating and promoting an enabling and sustainable transport industry in Kenya. However, gender specific actions should be highlighted especially on addressing the barriers to meaningful participation by women in general but specifically in the 2/3 wheeler sector. The role of women as key players in the successful implementation of the plans must also be stressed and their maximum participation in design and evaluation solicited.



Table 7: Regulatory Standards

| Legal Document | Overview/Summary |
|---------------------|---|
| KSISO6469-1:2019 | Electrically propelled road vehicles-Safety specifications -Part 1: Rechargeable energy storage system (RESS) |
| KS ISO 6469-2:2018 | Electrically propelled road vehicles-Safety specifications -Part 2: Vehicle operational safety means and protection against failures. |
| KSISO6469-3:2018 | Electrically propelled road vehicles-Safety Specifications-Part 3: Electrical safety |
| KSISO6469-4:2015 | Electrically propelled road vehicles – safety specifications part 4: post-crash electrical safety |
| KSISO/TR8713:2012 | Electronically propelled road vehicles – vocabulary |
| KSISO8714:2002 | Electric road vehicles- reference energy consumption and range. Test procedures for passenger cars and light commercial vehicles |
| KSISO8715:2001 | Electric road vehicles – road operating characteristics |
| KSISO/TR11955:2008 | Hybrid electric road vehicles- guidelines for charge balance measurement |
| KSISO12405-4:2018 | Electrically propelled road vehicles-Test specification for lithium-ion traction battery packs and systems-Part 4: Performance testing. |
| KSISO/PAS16898:2012 | Kenya Standard – Electrically propelled road vehicles – Dimensions and designation of secondary lithium-ion cells, First Edition. |
| KSISO17409:2015 | Kenya Standard – Electrically propelled road vehicles – Connection to an external electric power supply – Safety requirements, First Edition. |
| KSISO18300:2016 | Electrically propelled road vehicles – Test specifications for lithium-ion battery systems combined with lead-acid battery or capacitor, First Edition. |
| KSISO/PAS19295:2016 | Specification of voltage sub-classes for voltage class B. |
| KSISO/PAS19363:2017 | Electrically propelled road vehicles-magnetic field wireless power transfer safety and interoperability requirements |
| KSISO23274-1:2013 | Hybrid-electric Road vehicles-exhaust emissions and fuel consumption measurement's part 1: non externally chargeable vehicles |
| KSISO23274-2:2012 | Hybrid-electric Road vehicles- exhaust emissions and fuel consumption measurement's part 2: externally chargeable vehicles. |
| KSISO/TR13062:2015 | Electric mopeds and motorcycles – terminology and classification. |
| KSISO13063:2012 | Electrically propelled mopeds and motorcycles – safety specifications |
| KSISO13064-1:2012 | Battery-electric mopeds and motorcycles- performance part 1: reference energy consumption and range. |
| KSISO13064-2:2012 | Battery-electric mopeds and motorcycles- performance part 2: road operating characteristics. |
| KSISO15031-6:2015 | Road vehicles – Communication between vehicle and external equipment for emissions-related diagnostics Part 6: Diagnostic trouble code definitions. |

Source: (KEBS, 2019)

Despite the existence of the policies and regulatory frameworks highlighted in Tables 3 to 6, electric mobility in Kenya still faces uptake barriers. A study by Energy and Petroleum Regulatory Authority (EPRA)⁴⁶ in 2020 on integrating Electric two and three-wheeler into existing Urban Transport Modes in Kenya, highlighted the following key barriers: high upfront purchase costs, where the comparative costs of EVs⁴⁷ are expensive compared to ICES⁴⁷; lack of electric mobility model of choice; technological concerns such as driving range, battery life, charging zones; and customer information gaps on long-term benefits of adopting EVs. Some of the proposed options to consider in overcoming these barriers include financial credit access to individuals and businesses migrating or adopting EVs, policy review to incorporate address issues of driving range, battery life, and charging infrastructure⁴⁸.

⁴⁶Integrating Electric 2 and 3-Wheeler into existing Urban Transport Modes in Kenya: Institutional arrangement and policy implications for electric mobility in Kenya, 2020

⁴⁷In the long term, EVs operational costs are less compared to ICES

⁴⁸ibid

CHAPTER FOUR

4.0 METHODOLOGY

4.1 Research Design

This study adopted the use of a descriptive survey research design. The descriptive survey design was adopted because of its ability to measure the characteristics of the population without interfering with the study environment. The design also makes it possible to describe the characteristics of the population using both quantitative and qualitative measures. The design was also relevant for its ability to provide in-depth analysis, explanations of findings based on the study variables. A descriptive survey design was essential for exploring the gender dimension in the two-wheeler and three-wheeler sector; describe the gaps/opportunities in integrating gender into the two-and three-wheeler electric mobility uptake, and also provide an adequate description of policy gaps in the uptake of electric mobility in Kenya, including recommendations.

4.2 Study Population and Sample Size

According to the KNBS (2020) Economic Survey, the total number of the registered motor and auto cycles is 1,427,533. Riders, operators, and sector auxiliary service providers formed the target population for this study. The target counties were Nairobi, Mombasa, Kisumu. The counties were selected since they have a sizeable population that depends on two and three-wheeler transport mobility. However, actual data on the target population for two and three-wheelers in the target counties was not known, which resulted in a convenient sampling of 1184 respondents were interviewed: 478 male riders, 60 female riders, 423 female commuters, and 223 women in the auxiliary services (mechanics, car wash, courier services and those selling wheelers accessories such as spare parts. The sample simple size distribution is summarized in Tables 8, 9, and 10.

Table 8: Riders / Drivers Sample Size Distribution Table

| | Nairobi | Mombasa | Kisumu | Total |
|--------------|-------------------|-------------------|-------------------|------------------|
| Male | 123 (88%) | 141 (90%) | 214 (89%) | 478 (89%) |
| Female | 17 (12%) | 16 (10%) | 27 (11%) | 60(11%) |
| Total | 140 (100%) | 157 (100%) | 241 (100%) | 538(100%) |

Table 9: Female Commuters Sample Size Distribution Table

| | Frequency | Percent |
|--------------|------------|-------------|
| Nairobi | 174 | 41% |
| Mombasa | 117 | 28% |
| Kisumu | 132 | 31% |
| Total | 423 | 100% |

Table 10: Female Commuters Sample Size Distribution Table

| | Frequency | Percent |
|--------------|------------|---------------|
| Nairobi | 13 | 5.8% |
| Kisumu | 81 | 36.3% |
| Mombasa | 129 | 57.8% |
| Total | 223 | 100.0% |

4.3 Sampling Strategy



A multi-stage cluster sampling was adopted. Each of the study regions was divided into several entry points that formed data collection points, where convenient sampling took place until the required numbers were achieved. In Nairobi, the points of data collection were; City Stadium, GPO roundabout, Globe Cinema, Nyayo Stadium roundabout, and the university way roundabout for the two-wheelers. For the three-wheelers, the main data collection points were: City Stadium, downtown, and Kibra, these are the main areas where three-wheelers operate in Nairobi. In Kisumu, the data collection points were; Kachok, Ahero Mowuok, Kondole roundabout, and Milimani, Kisumu Boys area, Agakhan, Nyalenda, Katito, Sondu, Kisii, Homa-Bay, Soriland Mbita for both two-wheelers and three-wheelers. In Mombasa, the points of data collection were Likoni Ferry Junction, Likoni, Mama Ngina Drive, GPO, Light, Kongowea, Tononoka, and the Central Business District.

4.4 Data Collection Method

Both quantitative and qualitative methods were employed. For male and female riders, semi-structured questionnaires (annexed) were used to collect data. The questionnaire was structured thematically as follows: section 1 collected riders' demographic data, section 2 collected data on opportunities and challenges for gender inclusion in two- and three-wheeler sector; section 3 collected data on the uptake of electric mobility; and the last section 4 examined some of the prevailing policy challenges and gaps, and possible recommendations. For the female commuter survey, a semi-structured questionnaire (annexed) was also used to collect quantitative data. The tool was structured thematically as follows: Section 1 collected data on female commuters' demographic data; section 2 documented reasons for the choice of using the two or three-wheelers transport services, section 3 examined the inherent challenges female commuters face while using the two- and three-wheeler services, while section 4 documented data on knowledge and viability of using electric two and three-wheeler mobility services. For the auxiliary service providers, a key informant open-ended questionnaire (annexed) was used.

The questions were structured around the study objectives: Gender inclusion in the two and three-wheeler sector, current challenges and gaps for gender inclusion; integrating women in the uptake of electric two and three-wheeler sector, and policy gaps, opportunities, and recommendations. For the two- and three-wheeler Sacco members, a focus group discussion guide was administered to female riders. The questions were structured around the study objectives: Gender inclusion in the two and three-wheeler sector, current challenges and gaps for gender inclusion; integrating women in the uptake of electric two and three-wheeler sector, and policy gaps, opportunities, and recommendations. The data collection processes included approaching the riders at each data collection point, introducing ourselves, the objective of the study, and requesting permission to participate in the survey. For KIIs and FGDs, a list was developed in collaboration with each region's two- and three-wheeler leaders. The same process of explaining the study objectives was conducted, and permission was requested for participation in the study.

4.5 Data Analysis and Presentation

All quantitative data surveys (Female and Male riders, and female commuters) were entered into Statistical Data for Social Studies (version 24), where checking of errors, incomplete data, and data cleaning to ensure the data was valid and reliable. This was followed by where coding of the data for each region, and descriptive analysis of the data for each region per study objectives. For qualitative data gathered from the KIIs and FGDs, the data was entered into an excel master sheet where coding of the qualitative data by region and respondents was done. This was also followed by checking for errors, incomplete sentences, and cleaning. Thirdly, a content analysis was examining trends emerging issues and key findings collaborated and compared with the data from the other regions. To mitigate data biases, quantitative survey data was triangulated with the qualitative data to help collaborate the findings, and also to provide a deeper understanding of the statistical figures. The findings of this study for quantitative data have been presented using Tables and Figures, while qualitative data from KII and FGDs has been presented using narrative prose, and quote citations from the respondents.

4.6 Limitations of the Study

This study was conducted in Nairobi, Kisumu, and Mombasa. The findings may not provide a complete reflection of the study objectives across all the cities and rural areas where two- and three-wheeler sectors operate. However, most of the Kenyan cities and rural areas (apart from marginalized regions) have close to similar demographic characteristics, which, to the extent possible allows for the generalization of the findings to the rest of the country.



CHAPTER FIVE

5.0 RESULTS AND FINDINGS

5.1 Introduction

This chapter presents the study results and findings. The demographic data of the study respondents is presented first, followed by results on gender dimensions in the two and three-wheeler mobility, gaps and opportunities for integrating gender into electric two-wheeler and three-wheeler mobility, uptake of electric mobility in the two-wheeler and three-wheeler sector, and policy priorities to support wider uptake of electric mobility in Kenya given gender- considerations.

5.2 Demographic Profile of Respondents

The two and three-wheeler sector was male-dominated as reflected in the study findings. Out of the 538 (356 riders and 182 drivers) surveyed 478 (89%) were male, 60 (11%) were female. Nairobi was represented by 140 riders and drivers (88% male, 12% female); Mombasa was represented by 157 riders and drivers (90% male, 10% female); Kisumu was represented by 241 drivers and riders (89% male, 11% female) as summarized in Figure 1. When respondents were analyzed on the area of specialization, 339 (63%) were two-wheelers (motorcyclists); 182 (34%) were three-wheelers (Tuk-Tuk riders), and 16 (3%) were two-wheeler (bicycle-cyclist) as indicated in Figure 2. Based on the study findings, the gender gap still exists in the sector. The culture of impunity, enforcement of the law and regulations, and operational standards in the two and three-wheeler sector has continued to inhibit female engagement.

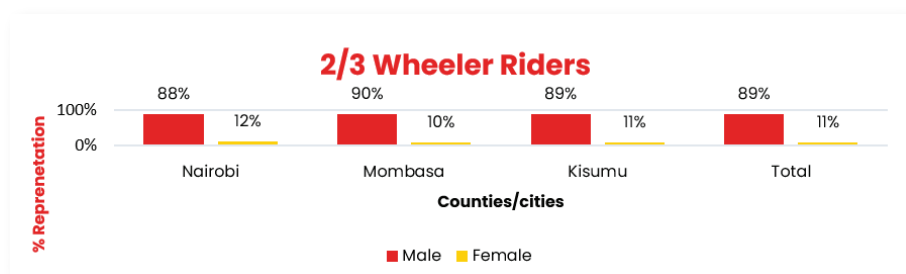


Figure 1: 2/3-Wheeler -Respondents

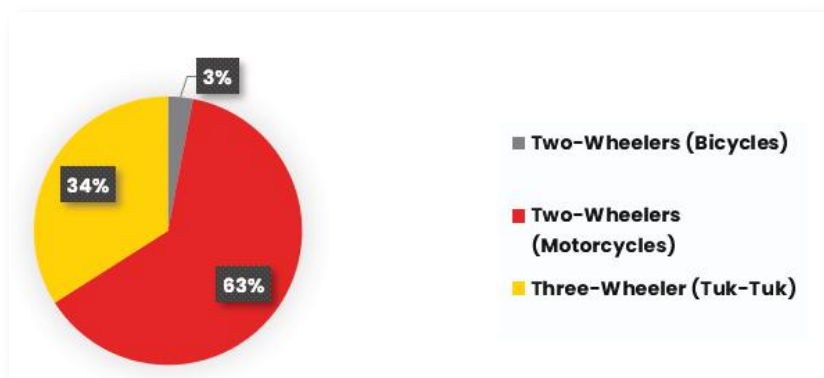
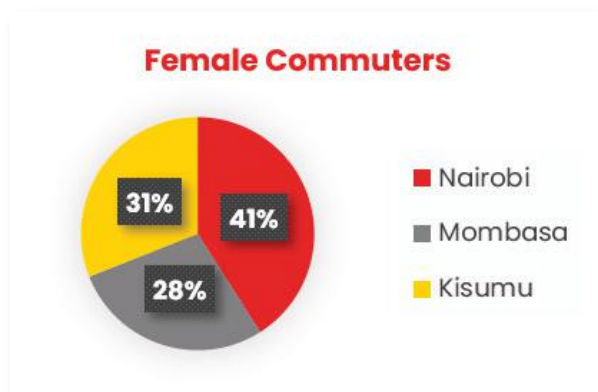


Figure 2: 2/3-Wheelers Area of Specialization



This study targeted 423 female commuters in the two and three-wheeler sector. The distribution of the respondents was as follows: 173 (41%) were commuters from Nairobi; 131 (31%) were commuters from Kisumu; while 119 (28%) were commuters from Mombasa as summarized in **Figure 3.**

Figure 3: 2/3-Wheeler Female Commuters

Addressing other systematic challenges such as a culture of impunity and violence in the informal transport sector, sexual harassment, and abuse, revamping both local and rural road infrastructure, and enforcing the sector regulations and policies and law, will significantly improve opportunities for women and girls' involvement in the sector in Nairobi, Mombasa, and Kisumu.

Based on the study findings, a majority (86%) of two and three-wheelers were aged between 18 and 39 years. Regionally, a majority (80%) of Nairobi riders were aged between 18 and 39 years; and in Kisumu, a majority (88%), while a majority (61%) of riders from Mombasa were aged between 18 and 39 years as summarized in Table 11. For 2/3-wheeler female commuters, a majority (82%) were aged between 18 and 39 years. Comparatively, Nairobi had a majority (81%) of female commuters aged between 18 and 39 years, with a similar age group being the majority in Kisumu (82%) and Mombasa (78%) as indicated in Table 13. As indicated by this finding, the youth (18–34 years) are highly represented compared to other age groups. The challenge of unemployment affects this group more than other age groups in the study regions. However, the findings show that adults who are 35 years and above are also engaged in the sector for economic livelihood. The two and three-wheeler sector has merged as a leading employer of unskilled youth and adults.

Table 11: 2/3-Wheeler Respondents Age

| | Nairobi | Mombasa | Kisumu | Total |
|----------------|---------|---------|--------|-------|
| Below 18 years | | 1.3% | | .4% |
| 18– 24 years | 6.4% | 8.3% | 7.9% | 7.6% |
| 25– 29 years | 32.1% | 31.2% | 29.0% | 30.5% |
| 30– 34 years | 24.3% | 31.2% | 31.1% | 29.4% |
| 35–39 years | 17.1% | 17.8% | 20.3% | 18.8% |
| 40– 44 years | 10.0% | 7.6% | 8.3% | 8.6% |
| 45– 50 years | 7.1% | 1.3% | 3.3% | 3.7% |
| Above 50 years | 2.9% | 1.3% | | 1.1% |

Table 12: 2/3-Wheeler Female Commuters Age

| | Nairobi | Mombasa | Kisumu | Total |
|----------------|---------|---------|--------|-------|
| Below 18 years | .6% | 5.1% | .8% | 1.9% |
| 18– 24 years | 22.4% | 13.7% | 13.6% | 17.3% |
| 25– 29 years | 26.4% | 29.9% | 34.8% | 30.0% |
| 30– 34 years | 16.1% | 20.5% | 24.2% | 19.9% |
| 35–39 years | 16.1% | 13.7% | 14.4% | 14.9% |
| 40– 44 years | 9.8% | 10.3% | 7.6% | 9.2% |
| 45– 50 years | 6.9% | 4.3% | 3.0% | 5.0% |
| Above 50 years | 1.7% | 2.6% | 1.5% | 1.9% |

The age distribution for 2/3-wheeler riders was 32.2% primary level education, 46.3% had secondary level education, 10.8% had certificate level education, 8.7% had diploma level education, while 1.9% had a degree-level education as summarized in Table 13. When education level was examined against gender, primary level education was represented by 40% female, 31% male; respondents with secondary level education were represented by 48% male, 32% female; certificate level was represented by 11% male, 12% female; diploma had 9% male, 8% female; while 7% female and 1% male had either a degree/post-graduate degree as summarized in Figure 7. These findings show that youth with low levels of education are highly represented in the two-three-wheeler sector. This could be explained by the fact that the sector does not require academic qualification, but rather, knowledge on how to ride a two or three-wheeler, and a license. The low levels of education make it difficult for women in the sector to engage in high technical skills sectors of manufacturing, engineering, and mechanic.

This finding collaborates with Sen's (1993) argument on expanding people's capabilities than focusing on resources. In this regard, enhancing women capabilities to function and thrive in the transport sector begins with an education system that puts women at the center of science, mathematics, and technology, that have opportunities to enhance women involvement in engineering, manufacturing, and related transport sector value chains, including the two and three-wheeler sector, and e-mobility. The Integrated National Transport Policy for Ministry of Transport, Kenya highlights issues of gender equality and inclusion in the transport sector. However, the policy does not provide enforcement mechanisms for adequate compliance on gender inclusion.

Table 13: 2/3-Wheeler -Level of Education

| | Nairobi | Mombasa | Kisumu | Total |
|-----------------|---------|---------|--------|-------|
| Primary level | 26.4% | 30.6% | 36.5% | 32.2% |
| Secondary level | 46.4% | 49.0% | 44.4% | 46.3% |
| Certificate | 9.3% | 12.7% | 10.4% | 10.8% |
| Diploma | 15.0% | 7.0% | 6.2% | 8.7% |
| Degree | 2.9% | .6% | 2.1% | 1.9% |
| Post graduate | | | .4% | .2% |

Gender comparison of riders education level

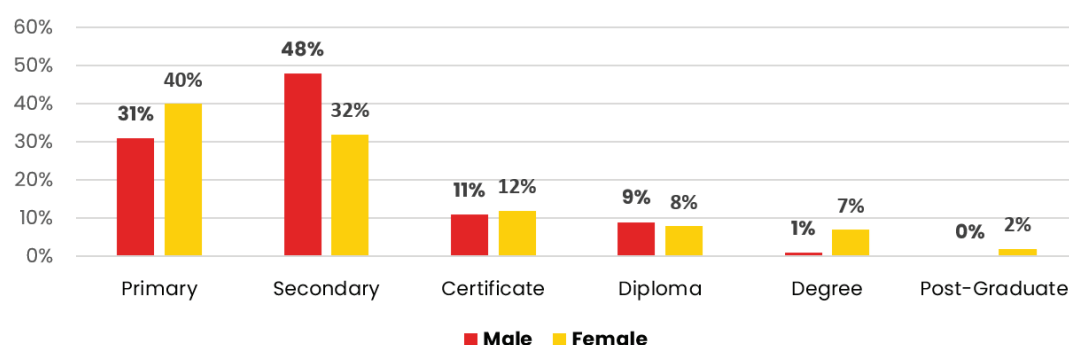


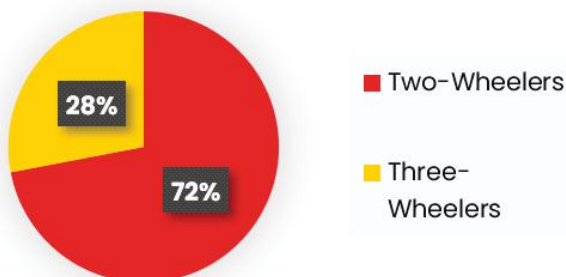
Figure 4: 2/3-Wheeler Gender Comparison on Level of Education

5.3 Gender Dimensions of Two and Three-Wheeler Mobility in Kenya

Based on the study findings, a majority (89%) of men dominated the two and three-wheeler sector compared to 11% female representation. Gender dimension across the three study regions indicated that men still dominated: Kisumu (89% male, 11% female); Mombasa (90% male, 10% female riders), and Nairobi (88% male, 12% female riders). The sector is dominated by youth with 73% are female study respondents below 35 years of age. Out of the 60 female -riders who took part in the survey, 72% specialized in two-wheelers while 28% specialized in three-wheelers as highlighted in Figure 5.



Female Specialization in 2/3 Wheeler sector



With regards to specialization, 72% of women riders specialize in two-wheelers while 28% specialize in three-wheelers. Kisumu is leading with more (88%) women riders in two-wheelers while Mombasa has a majority (89%) of women riders operating three-wheelers against an overall 28%.

Figure 5: Female Specialization in 2/3-Wheeler Sector

The level of female specialization for two-wheelers, as opposed to three-wheelers, was informed by the fact that two-wheelers are most preferred in Nairobi, and Kisumu, with larger populations as compared to the three-wheelers mostly preferred in Mombasa. This explains why 72% of the female riders were in the two-wheelers as opposed to the three-wheeler mobility sector. The higher levels of male domination of the two and three-wheeler sector was attributed to an unconducive environment that favors males at the expense of the female riders. For instance, the risk of exposure to abuse and assault, sexual abuse is more pronounced for female riders and commuters. Female focus group discussants revealed that the operational environment is more masculine, where 'thorax and zest' are used to fight for passenger clients. Being perceived as weak (in terms of stamina and strength), female riders find themselves disadvantaged in jostling to get clients using a similar 'thorax' approach employed by some of their male colleagues. As a result, females in the sector are preferring auxiliary services (mechanics, car wash, and sales of wheelers parts) which are less competitive.

"In terms of organization, the sector is not well-organized and has no formal structures. The Tuk-Tuks operates freely as they are mostly individually operated. The boda-boda on the other hand though operates outside the city, are informally organized into bases – mini-informal stages where they can pick commuters. Since the sector is dominated by men, operational decisions do not provide adequate protection and safeguarding for female riders and drivers, which exposes them to different forms of abuse. As a result of these challenges, most women prefer to engage in the sector as owners of the two and three-wheelers, where they lease out their wheelers to male riders/drivers for a fee. The majority of the women are also found in sales and other ancillary services such as sales, marketing, and cleaning within the sector..."

Two-and Three Wheelers FGD Member, Mombasa

Discussion with Falcon Tuk-Tuk Sacco Secretary collaborated the findings on male dominance in the sector:

"Not many women operate in the transport sector since the sector is male-dominated. Out of 104 Tuk-Tuks, we have 5 female drivers. Recruiting more female drivers is still a challenge. However, our SACCO has been accommodating women, out of the 104 Tuk-Tuks in operation, 7 are owned by women. Our SACCO has supported women interested in the sector that is why seven have registered their Tuk-Tuks with the SACCO and have employed young youths as drivers operating them"

Falcon Tuk-Tuk Sacco Secretary, Nairobi

Discussions with key informants revealed that women lack adequate time to venture into the two and three-wheelers revealed that gendered roles require women to perform most of the domestic work, including cleaning, cooking, and taking care of children, which does not provide sufficient time required for one to succeed in the sector.

"The sector mode of operation especially hours of operation are not favorable to women. Even the women drivers we have are not consistent they see this as short-time engagement as they look for better jobs. Women feel the sector is for men and some men disrespect women and I do not think it's about the sector but how some men are acculturated to dominate women"

Falcon Tuk-Tuk Sacco Secretary, Nairobi

"The sector operational hours are not favorable to women – very early mornings and very late in the night. Secondly, the informalities in the sector, the rowdiness, and arrogance associated with the male-dominated sector push away women who are not willing to soil their behavior by being associated with the rowdiness of the sector. Most men don't respect women in the sector and view them as weaker sex...the perception that only the rogue and hardened drivers, riders, and operators can survive the sector. Young women in the sector often face sexual harassment from both their fellow drivers/riders, operators, and the everyday commuters, which makes the sector unattractive to women..."

Stage Manager –Tuk-Tuk –Makadara, Nairobi

Secondly, cultural gender biases and perceptions that the two- and three-wheeler transport sector is the work of men, and that women are not skilled enough to use the wheelers to offer services to men. Additionally, for female commuters, particularly in Mombasa, two-wheelers among women were deemed inappropriate due to the way passengers are expected to sit and the proximity to the wheeler rider, which forces women to side-saddle, enhancing the risk for the commuter.

Preference and Choice of 2/3 Wheeler for Commuter Services

The study examined the attributes that inform choice and preference for female commuters for the two and three-wheeler services. The most preferred attribute that informs the choice of female commuters' utilization of two and three-wheelers was convenience (52%). Kisumu had the highest convenience need at (57%) followed by Nairobi (56%), and Mombasa (40%). Other areas that informed female commuters' preference for two and three-wheelers had minimal scores: On average, need for safety (16%), comfort (13%), cost (11%), and space (4%) as summarized in Figure 6. The commuter's choice of two and three-wheelers was highly rated for convenience since the two and three-wheelers can get to remote areas, use tiny roads and pathways that taxis and other public transport vehicles cannot. Additionally, the choice was informed by the fact that 2/3 wheelers can navigate traffic jams, and get commuters to desired destinations faster compared to taxis and other public transport vehicles.

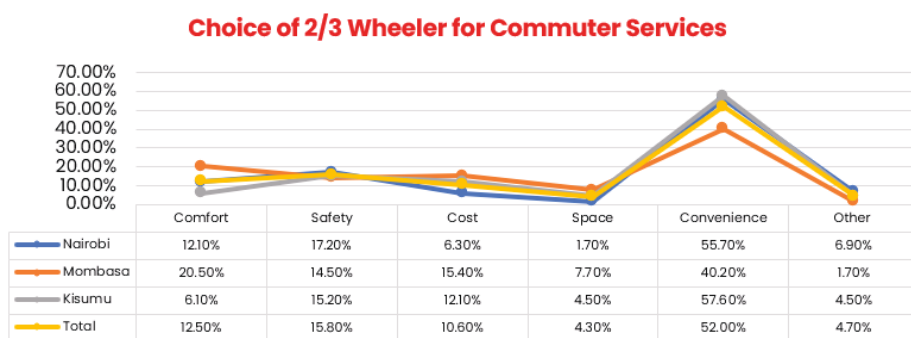


Figure 6: Choice of 2/3 Wheeler for Commuter Services

When female riders were asked to indicate if they had experienced any form of abuse during work, a majority (51%) indicated they had been subjected to verbal abuse from time to time; (22%) had been asked for sexual favors both from male passengers and male riders; (18%) had experienced physical harassment, while (9%) had experienced indecent gestures as summarized in Table 14. Female riders being asked for sexual favors were high in Nairobi (27%) and Mombasa (24%). Verbal harassment experienced by female riders was high in Kisumu (61%) followed by Mombasa (49%), while physical abuse was more pronounced in Nairobi (39%) as noted in Table 14. Therefore, to enhance women's inclusion in the sector, there is a need for government to enforce the law by bringing the offenders (sexual, verbal, physical) to account. Prosecuting known offenders will not only act as a deterrent mechanism but also ensure that women's confidence and protection in the sector is enhanced.

Table 14: Type of Abuse Experienced by 2/3-Wheeler Female Riders

| | Nairobi | Mombasa | Kisumu | Total |
|--------------------------|---------|---------|--------|-------|
| Indecent Gestures | 7.4% | 13.2% | 7.2% | 8.6% |
| Asked for sexual favours | 26.5% | 23.5% | 18.7% | 21.5% |
| Verbal harassment | 30.9% | 48.5% | 60.8% | 51.3% |
| Physical harassment | 33.8% | 14.7% | 12.0% | 17.5% |
| Other | 1.5% | | 1.2% | 1.0% |

The study also examined whether female commuters who use the two and three riders experienced any form of abuse while seeking transport services. A majority (66%) of female commuters had experienced verbal harassment, while (21%) had experienced physical harassment. Kisumu female passengers had experienced the highest form of verbal harassment (78%), followed by Mombasa (59%) and Nairobi (54%). Physical harassment was more pronounced in Mombasa for female commuters (28%), followed by Nairobi (27%). Other forms of abuse experienced by female commuters are summarized in Table 15.

Table 15: Type of Abuse Experienced by 2/3-Wheeler Female Commuters

| | Nairobi | Mombasa | Kisumu | Total |
|---------------------|---------|---------|--------|-------|
| Indecent gestures | 11.9% | 12.5% | 9.0% | 10.7% |
| Verbal harassment | 53.7% | 59.4% | 78.2% | 65.5% |
| Physical harassment | 26.9% | 28.1% | 12.8% | 20.9% |
| Others: | 7.5% | | | 2.8% |

Female commuters were asked to indicate the need they have for using the two and three-wheeler services. Based on the findings, a majority (73%) of female commuters use two and three-wheelers to get to work, (10%) to get to school, (7%) for shopping, (3%) for visiting family and friends, and (4%) for other errands. Kisumu had the highest utilization of two and three-wheelers for work commuting, followed by Mombasa (73%) and Nairobi (66%) as highlighted in Table 16. Based on this finding, it is evident that female commuters prefer using 2/3 wheelers mostly for work-related mobility just like their male counterparts. This shows that Kenya, and particularly the study regions still have a challenge of an efficient transport system that can make it easy for workers to get to their workplaces in time.

Table 16: The Need for using 2/3-Wheeler by Female Commuters

| | Nairobi | Mombasa | Kisumu | Total |
|-----------------------------|---------|---------|--------|-------|
| Work | 66.4% | 73.2% | 79.5% | 73.4% |
| School | 6.4% | 8.0% | 14.2% | 9.7% |
| Visiting friends and family | 6.4% | 3.6% | | 3.2% |
| Shopping | 14.5% | 7.1% | 4.7% | 8.6% |
| Treatment | | .9% | | .3% |
| Accompanying children | .9% | 1.8% | .8% | 1.1% |
| Other | 5.5% | 5.4% | .8% | 3.7% |

The survey on auxiliary services was conducted among 223 female respondents in the two-wheelers and three-wheelers sectors. The finding revealed that most of the women (46%) are in auxiliary services are doing cleaning/washing, (27%) sales and marketing, (22%) are owners/investors, (13%) do repair and maintenance of the two and three-wheelers; (11%) engage in decorating, and office administration respectively; (9%) are stage attendants, (8%) are managers (7%) delivery riders (5%) dealers/retailers, and (4%) are in manufacturing/assembly as summarized in Figure 7. The low involvement of women in technical areas such as manufacturing and assembling was attributed to limited interest and enrolment of girls in engineering, and mechanics necessary for the manufacturing sector of two and three-wheelers.



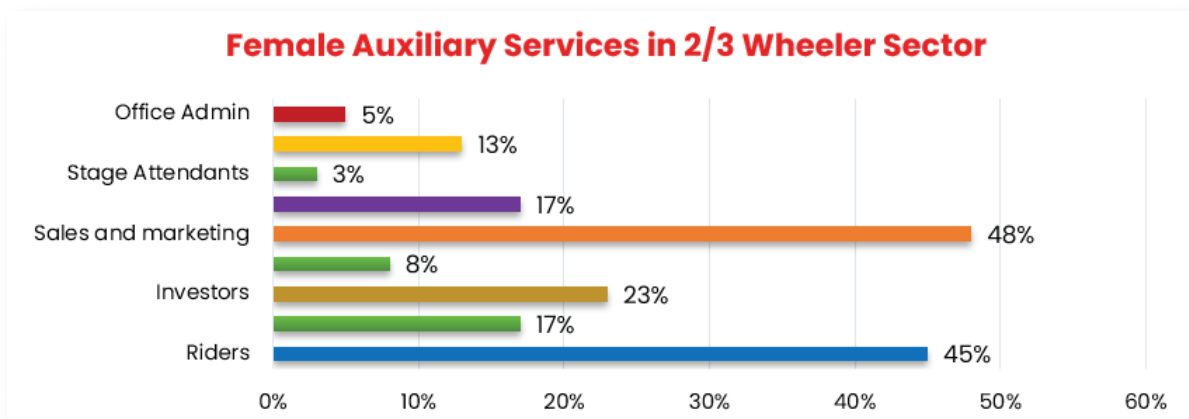


Figure 7: Female Auxiliary Services in 2/3-Wheeler Sector

5.4 Awareness of Electric Mobility in the two-wheeler and three-wheeler sector

Electric mobility in Kenya is still at its nascent stage. This study examined the level of awareness among the operators and uses of two and three-wheelers. The findings show that awareness of e-mobility was highest amongst the riders (62%), followed by (48%) among the auxiliary service providers, and (36%) among the female commuters surveyed.

When awareness of e-mobility was examined by region, riders in Nairobi had the highest awareness (78%), followed by riders in Kisumu (58%), and riders in Mombasa (57%) as summarized in Figure 8. Higher awareness in Nairobi is attributed to the fact that most electric prototypes are in Nairobi.

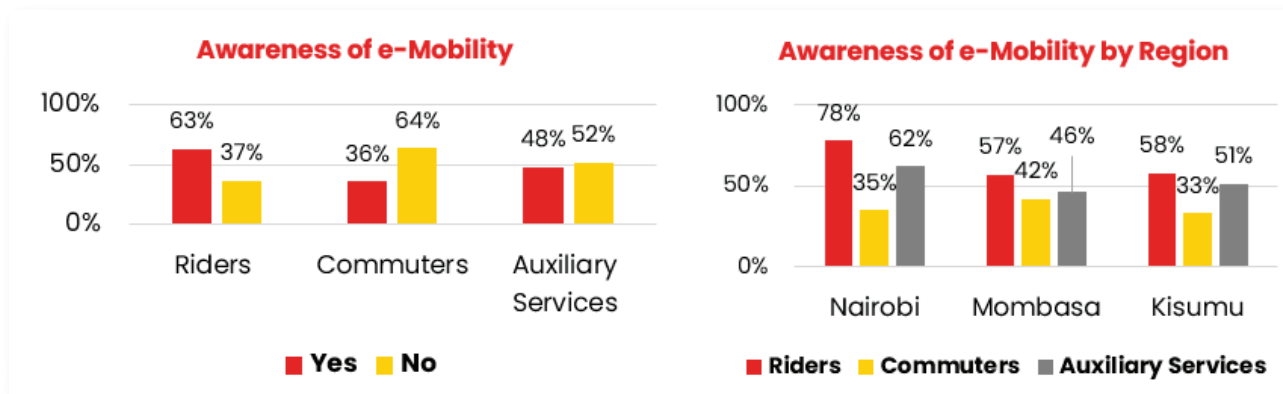


Figure 8: Awareness of e-Mobility

Key informant discussions noted that e-mobility is an attractive alternative to ICEs, and members are willing to adopt the use of two and three electric wheelers. However, the challenge still lies in availability and cost.

“The sector would be willing to have the electric vehicles should they be reliable in terms of charging places. The electric vehicle would help reduce pollution which is very good for health. The information on the Ubers’ that are electric is that they are cost-effective in terms of fuel and so this will help us who use a lot of money on fuel daily. There is no electric Tuk-Tuk in existence in the country, especially for PSV. Aware of Uber operating electric vehicles in the country in Nairobi for specific but still under piloting. Other electric modes are motorcycles are coming up, but they are expensive to purchase, and members do not have information where to purchase them...only for few wealthy people for having the electric motorcycles for leisure...”

Falcon Tuk-Tuk Sacco Secretary, Nairobi

Limited awareness was also attributed to a lack of information on efficiency, availability, effectiveness, and affordability of the 2/3 wheelers. Riders mostly use what is available to them. In this case, the ICE 2/3 wheelers. There is a need for the transport ministry, manufacturers, and distributors of electric wheelers to enhance information awareness creation among the riders, and sector proprietors.

E-Mobility Opportunities

Among the three regions that participated in the study, Kisumu had the highest preference by women for a two-wheeler in the e-mobility at (74%). Followed by (64%) two-wheeler e-mobility preference in Nairobi and (9%) in Mombasa. For the three-wheelers, e-mobility was highest in Mombasa (44%), and Nairobi (15%), and Kisumu (6%). Electric car preference was higher in Mombasa (46%), followed by (23%) in Nairobi, and (16%) in Kisumu. Preference for e-Scooters⁴⁹ was (4%) in Kisumu and (1%) in Mombasa as summarized in Figure 9.

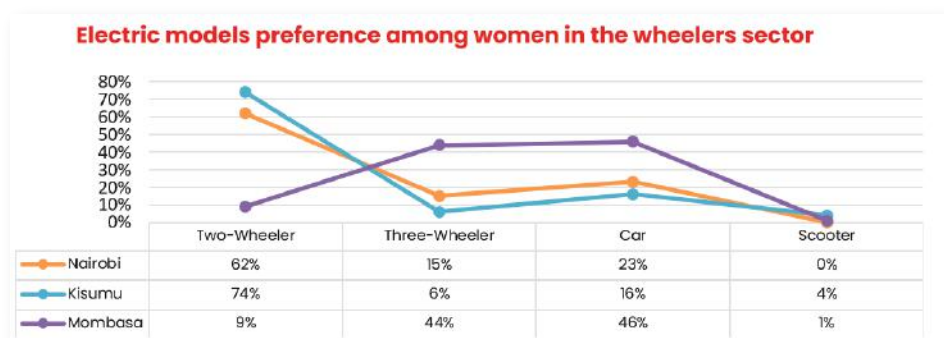


Figure 9: Preference for e-Mobility Models among Women in the Wheeler Sector

Despite the vast opportunities in the e-mobility for two and three-wheelers, technical skills areas such as manufacturing and assembling remain male-dominated. To enhance women and young girls' engagement in the e-mobility sector, the UNESCO project in Kenya is supporting young women scientists and mentoring girls to engage in Science, Technology, and Mathematics (STEM) and a way of enhancing their capabilities to compete for inclusion in e-mobility manufacturing, assembly, renewable energy, and related value chains. Offering training opportunities to women on this new technology is thus very significant for tapping the opportunities available. Strathmore Energy Research Centre is also offering specific training for women on solar photovoltaic one technical area with few women, and as a result, 300 women have so far been trained on this donor-based program.

Currently, firms involved in converting internal combustion engines like Opibus, and the Fika mobility are all in Nairobi. Nairobi also hosts fleet service vehicles that are electric, such as Nopea. For Kisumu, the level of awareness was attributed to the United Nations Environmental Programmes that has been supporting electric mobility projects in the area collaboration with the Kisumu County. UNEP project aims at reducing greenhouse emissions through sustainable transport in the region. In Mombasa, awareness was not attributed to any project or awareness drive, but rather sector information shared among the stakeholders. Based on these findings, there exists momentum and awareness of e-Mobility in the two and three-wheeler sector, which could be generalized to other cities not covered under the study as they hold close to similar transport characteristics.

Based on the study findings, gaps still exist in the sector, particularly addressing the culture of impunity, enforcement of the law and regulations, and operational standards in the two and three-wheeler sector. Addressing other systematic challenges such as a culture of impunity and violence in the informal transport sector, sexual harassment, and abuse, revamping both local and rural road infrastructure, and enforcing the sector regulations and policies and law, will significantly improve opportunities for women and girls' involvement in the sector

5.5 Factors affecting Uptake of Electric Mobility in the 2/3-Wheeler Sector

This study sought to examine factors that affect the uptake of e-mobility in the two and three-wheeler sector. First, riders were asked whether they have utilized an electric wheeler before this study. A majority (95%) indicated that had not used an e-wheeler, while (5%) has either driven or ridden on an e-wheeler. Nairobi had (7%) of riders among study respondents having utilized an e-wheeler, followed by Mombasa (6%), and Kisumu (4%) as indicated in Table 17. Based on this finding, it is notable that inadequate availability of the 2/3 electric wheelers has contributed to the under-utilization of the e-wheelers. Riders could only utilize what is available, affordable to them. Currently, ICE wheelers are still the most available and affordable, which explains the need to promote awareness of the e-wheelers, their environmentally friendly attributes, and also their reliability and long-term efficiency and effectiveness.

⁴⁹Scooters refers to mini motorcycles. E-Scooters are electric versions

Table 17: Prior Utilization of e-Mobility

| | Nairobi | Mombasa | Kisumu | Total |
|--------------------------------|---------|---------|--------|-------|
| Yes, I have driven /ridded one | 7.1% | 5.8% | 3.7% | 5.2% |
| No | 92.9% | 94.3% | 96.3% | 94.8% |

For riders, a majority (64% of respondents, (68% being female) indicated environmental friendliness as the main reason influencing uptake of e-mobility, followed by 40% who cited e-mobility renewable energy attributes, while 22% indicated e-mobility is economical compared to ICEs. For commuters (female), 65% indicated environmental friendliness as the main reason influencing uptake of e-mobility, followed by 11% who cited e-mobility renewable energy attributes, while 7% indicated e-mobility is economical compared to ICEs.

For auxiliary service providers, 57% indicated environmental friendliness as the main reason influencing uptake of e-mobility, followed by 40% who cited e-mobility renewable energy attributes, while 18% indicated e-mobility is economical compared to ICEs as summarized in Figure 10. Environmental friendliness was the major factor attributed by riders, commuters, and auxiliary service providers as the most significant driver in the up take of e-mobility. This finding shows that lack of awareness of other factors such as affordability, and efficiency could be inhibiting uptake.

Factors Influencing e-Mob Uptake

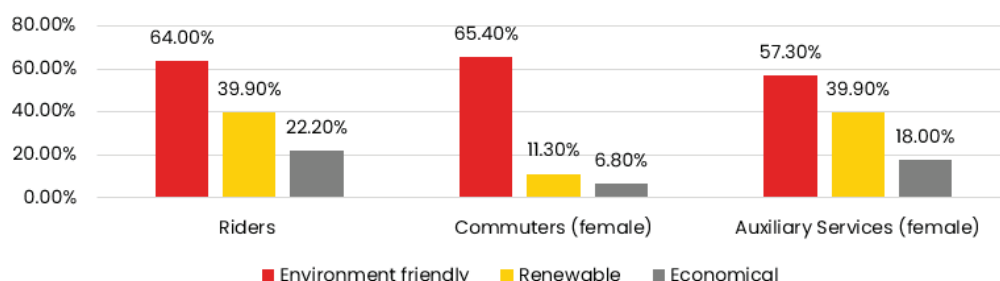


Figure 10: Factors Influencing e-Mobility Uptake in 2/3-Wheeler Sector

When the preference for e-mobility was compared with ICEs among riders and commuters, female commuters' preference for e-mobility was attributed to e-mobility wheelers using renewable energy (46%), environmentally friendly (23%), and fewer noise polluters than ICEs (23%). For riders, preference of e-mobility wheelers was largely informed by electric wheelers being environmentally friendly (43%), renewable energy utilization (41%), and less expensive (21%) as summarized in Figure 11.

The difference between riders (both male and female) and women commuters on preference for e-mobility could be considered as marginal, since both considered environmental friendliness and reliance on renewable energy. This means that the population has some level of awareness and information on e-mobility; what is required is enhancing this awareness, creating avenues for accessibility and affordability, and e-wheelers will see a larger adoption in the study regions.



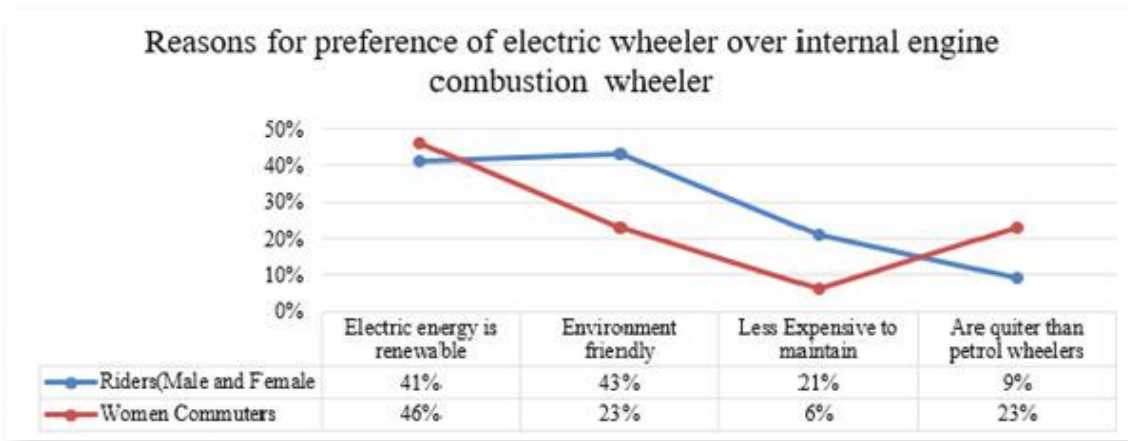


Figure 11: Preference for e-Mobility over ICE Wheelers

When female respondents in the auxiliary were asked to indicate some of the attributes they would consider in an electric wheeler, (56%) indicated they would consider the wheeler performance (45%) would consider energy cost (31%) purchase price, (15%), power consumption and time taken to charge the wheeler respectively, (14%) reduction of greenhouse emission, (6%) capacity of passengers, (5%) comfort/smooth, durability and operational cost respectively, and (1%) would consider the availability of spare parts as summarized in Figure 12. Despite the perceived female need for comfort when using 2/3 wheelers, this finding shows that majority would prefer performance. The ability to deliver required services effectively and efficiently in the required time.

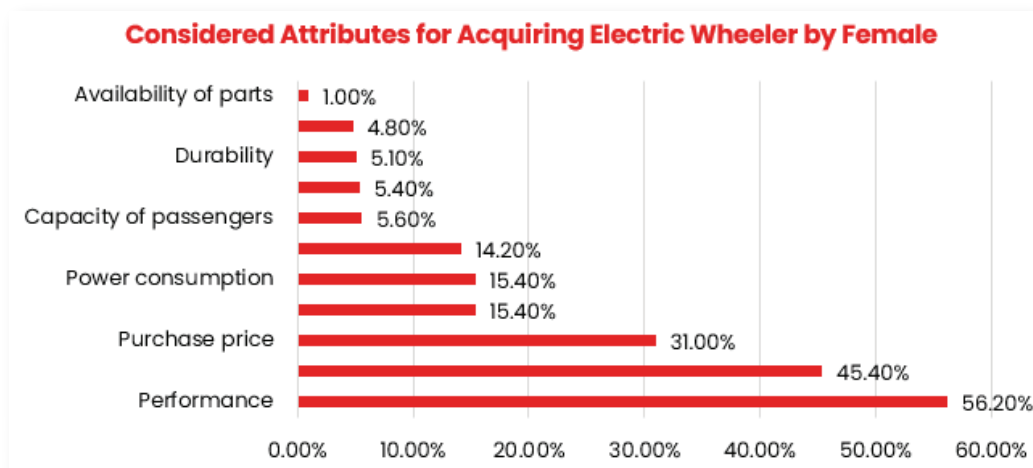


Figure 12: Considered Attributed for Acquiring Electric Wheelers –By Female Respondents

Other suitability factors for the adoption of e-mobility in the two and three-wheeler sector were examined by the study. Availability of charging points for the two and three-wheelers was the highest required adoption factor (44% male, 40% female), followed by the affordability of the two and three-wheelers (31% male, 20% female). The least adoption factor was the accessibility of the charging points (21% male, 20% female). Other adoption factors are summarized in Figure 13. This finding implies that there is a need to invest more availability and affordability of the 2/3 e-wheelers to enhance wider adoption. This could be done through favorable policy on e-wheelers, or cost reduction as was the case in 2008 for ICE wheelers.

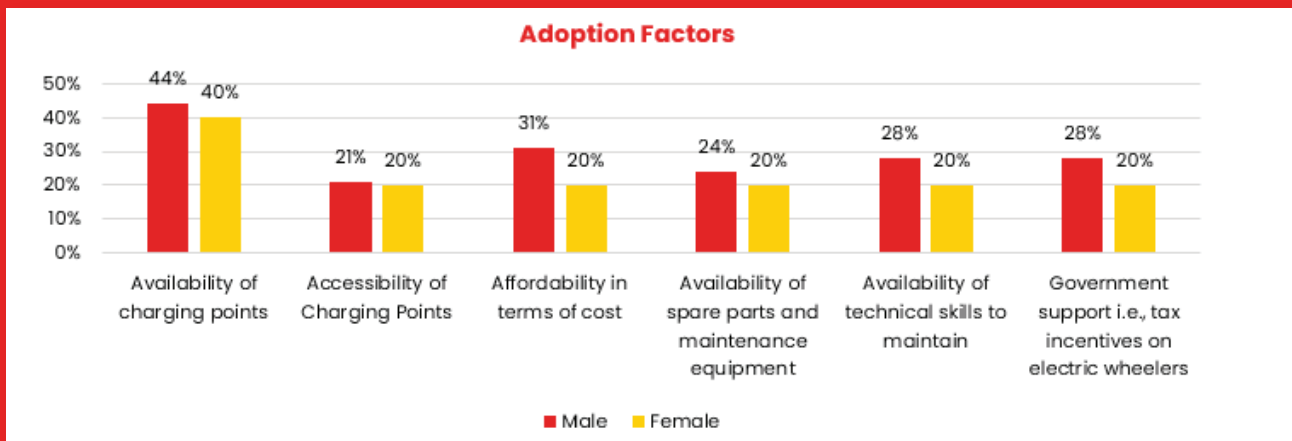


Figure 13: Adoption Factors for 2/3 Electric Wheelers

The barriers to effective adoption of e-mobility among the two and three-wheelers were examined. The initial purchasing cost of the 2/3 wheelers was considered as a leading barrier (36%) to the adoption of e-mobility; (31%) indicated unavailability of charging stations as a key barrier, (26%) lack of awareness, (21%) distance traveled after one full charge, (15%) time required to get a full battery charge, (13%) availability of few models, and (5%) battery replacement as summarized in Figure 15. The implication is that lack of awareness, unavailability of charging ports, and initial purchasing costs will continue to inhibit the adoption of e-wheelers in the study regions. Efforts by the ministry of transport and larger transport sector stakeholders should work towards eliminating these barriers, through policy formulation, subsidies, and other initiatives such as accessibility to business credit for purchasing e-wheelers.

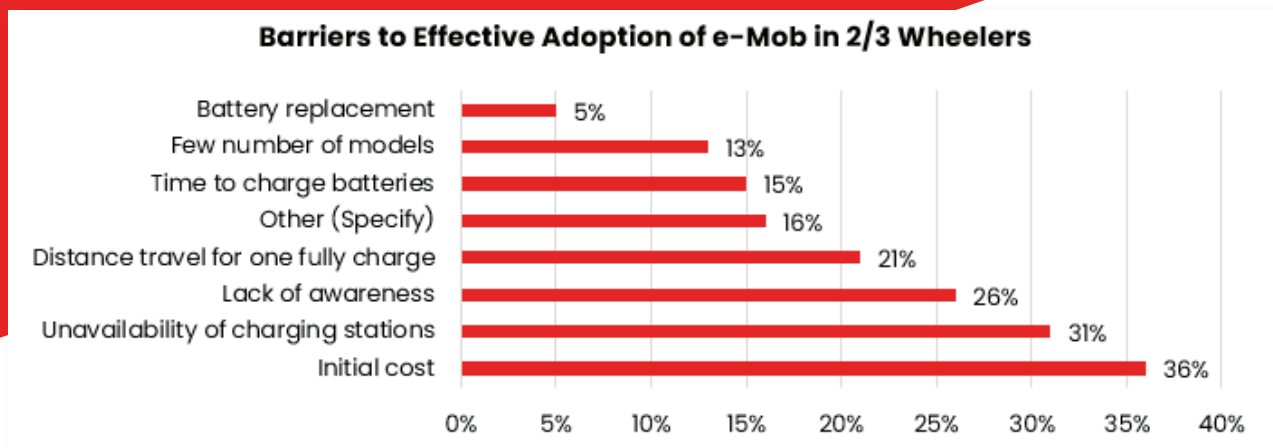


Figure 14: Barriers to Effective Adoption of e-Mobility in 2/3 Wheelers

Discussion with a three-wheeler stage manager in Nairobi collaborated some of the challenges highlighted in Figure 18 as follows:

The major challenge our members worry about is the durability of the charging batteries of the Tuk-Tuks and motorcycles...some of the questions we ask include: Will the batteries last long hours because most of our Tuk-Tuks operate 16 hours a day? Will the charging point be available in every place or station for already charged batteries for replacement as does the petrol station operation? The government needs to come up with charging points that are reliable and readily available for the many Tuk-Tuks in the country more so Nairobi, Kisumu, and Mombasa...the plugging system needs to be standard – the 244volts should apply for all the charging ports..."

Stage Manager –Tuk-Tuk –Makadara, Nairobi.



Similar focus group discussion with two and three-wheeler female operators, riders, and drivers in Mombasa collaborated both the opportunities and challenges inherent in the e-mobility in the sector as follows:

“There is a lot of excitement on the introduction of electric mobility in Kenya. The only concern is the durability, availability, and sustainability in terms of the spare parts. I have not been able to experience or get more information about electric wheelers. My colleagues are skeptical about their ability to operate electric wheelers during the rainy season, and how long distances can they cover without impacting their daily productivity. It is the need to make the wheelers available, affordable within the market price, and to ensure that charging systems are in place across the country with batteries being durable to cover long distance after charging...”

Female Focus Group Discussion Member, 2/3 Wheelers, Mombasa.

5.6 Policy Priority Areas for Uptake of e-Mobility in 2/3 Wheelers

To enhance the uptake of e-mobility in the two and three-wheelers, government policy has to be formulated and structured in a way that creates an environment, both in regulatory and facilitation spaces. Table 12 provides a summary of proposed policy priority areas.

The three highest priority areas include (67%) policy commitment on the longevity of battery utility; (59%) policy commitment to make 2/3 wheelers available and affordable; (55%) policy commitment that will ensure e-mobility engines for two and three-wheelers are durability. Other policy considerations are summarized in Table 18.

Table 18: Proposed Policy Priority Areas

| Policy Areas | Total |
|--|-------|
| Make the e-wheelers available and affordable | 59% |
| Zero rate taxes for electric wheelers and any component for the same | 35% |
| Provide incentives to manufacturers and assemblers to provide in bulk at low cost | 30% |
| Provide e-mobility infrastructures nationwide | 33% |
| Work together with petrol stations owners to install charging points for electric wheelers across the country. | 34% |
| Create awareness on benefits of e-mobility | 45% |
| Ensure the engine manufactured are durability | 55% |
| Ensure batteries would store power for long | 67% |
| Low power consumption | 38% |
| Ensure wheelers have enough space for the passenger and luggage | 27% |
| Avail spare parts in the market | 40% |

The Finance Bill of 2019 had proposed a reduction on the excise duty for electric vehicles from 20% to 10%, to provide adequate incentive for importation and use of electric motorcycles. There is a need to have the Finance Bills of 2022 and successive years adopt similar measures to ensure the availability and affordability of e-mobility wheelers. In 2008, the government granted tax waivers for the importation of two-wheelers, particularly motorcycles used by the youth as boda-boda transport services. Similar waivers should be anchored in policy for two and three e-mobility wheelers. Various standards for establishing e-mobility infrastructure have been established by the Kenya National Bureau of Standards (KNBS), however, the actual infrastructure across the study regions and other regions in the country is not yet in place. The new emerging areas in the proposed policy priority areas are the collaboration with major petrol stations to install charging points for electric wheelers across the country, and development of standards for e-mobility wheelers to have enhanced/adequate space for the passengers and luggage. Collaboration with manufacturers will be essential in the operationalization of the proposed priorities, if formulated, and adopted as in the two and three-wheeler sector.

5.6.1 Gender Perspective on Proposed Policy Priorities

To ensure gender sensitivity in policy formulation on e-mobility in the two and three-wheeler sector, respondents were asked to indicate policy priorities they perceived would enhance gendered uptake of two and three-wheelers. Policy commitments and regulations on noise reduction in two and three e-mobility wheelers were proposed by (28%) female commuters and riders, while (22%) proposed better design for the riders' seat to make it more comfortable; (21%) proposed larger space in the carrier for luggage/passengers. Adequate space makes both female riders and commuters more comfortable, compared to smaller carriers that do not provide adequate space/allowance between rider and passenger or luggage. For the three-wheelers, a similar policy proposal was suggested by (18%) of respondents. The smaller spaces within Tuk-Tuks make it challenging for passengers with luggage, particularly women and girls who handle domestic shopping, and require move light luggage from time to time as summarized in Figure 15

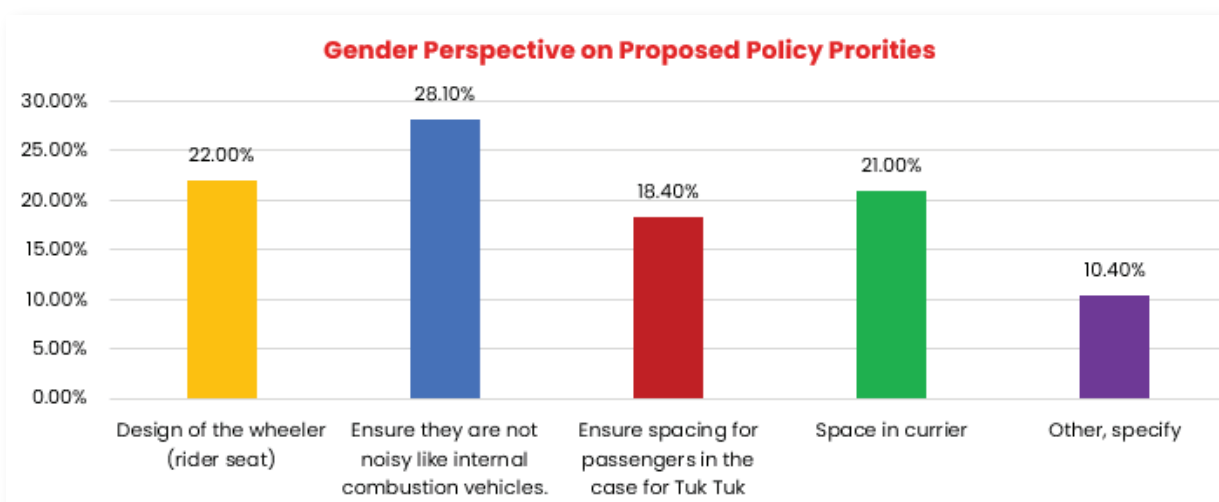


Figure 15: Gender Perspective on Proposed Policy Priorities

The findings of this study established that the female gender is under-represented in the two and three-wheeler sector service provision. Key service areas such as riders, manufacturers service providers, and auxiliary service providers have low levels of female representation. One of the reasons established by the study for the low involvement of women in the sector was attributed to the harsh working environment prevalent with sexual harassment. The risk of exposure to abuse and assault, sexual abuse is more pronounced for female riders and commuters. The two and three-wheeler operational environment is more masculine, where thorax and zest are used to fight for passenger clients. Being perceived as weak (in terms of stamina and strength), female riders find themselves disadvantaged in jostling to get clients using a similar 'thorax' approach employed by some of their male colleagues. As a result, females in the sector are preferring auxiliary services (mechanics, car wash, and sales of wheelers parts) which are less competitive. This finding collaborates findings by Mwobobia Mwita (2011) that noted that low levels of women representation was attributed to the high-risk natures of the sector as women are generally low risk-takers.

Secondly, findings of this study revealed that women lack adequate time to venture into the two and three-wheelers revealed that gendered roles require women to perform most of the domestic work, including cleaning, cooking, and taking care of children, which does not provide sufficient time required for one to succeed in the sector. This issue had been highlighted in Carr and Hartl (2010) study, where they argued that in developing countries, rural women divide their time between domestic work, childbearing/caring, farming, and non-farm activities which limits their engagement in transport sector services.

Thirdly, cultural gender biases and perceptions that the two- and three-wheeler transport sector is the work of men, and that women are not skilled enough to use the wheelers to offer services to men. Additionally, for female commuters, particularly in Mombasa, two-wheelers among women were deemed inappropriate due to the way passengers are expected to sit and the proximity to the wheeler rider, which forces women to side-saddle, enhancing the risk for the commuter. This finding confirms Porter (2011) and Gillen (2016) who established similar findings for dimensions of gender inclusion in the sector.

5.7 Policy Gaps to Support Uptake of Electric Mobility in Kenya

The study findings established several factors that are significant in enhancing the uptake of e-mobility in Kenya. Lack of adequate security and full enforcement of the law of sexual abuse, harassment of women and girls in transport terminals where motorcycle taxis and tuk-tuks drop and pick-up passengers/ commuters has continued to disproportionately affect women than men. The expansion of 2/3 wheelers, including the e-mobility sector still lacks gendered perspective to services delivery such as women for women services (women riders/ drivers providing exclusive services to women). Informal sector that 2/3 wheelers operate lacks adequate policy to safeguard women employed in the sector, particularly right to wages, leave, and flexible working hours when on maternity, when lactating, and the expectant mothers.

For riders, drivers and commuters' environmental friendliness renewable energy attributes, and cost. For female respondents in the auxiliary e-mobility services, the wheeler performance, energy cost, purchase price, power consumption, and time is taken to charge the wheeler respectively were the most considerable attributes. The study also established the following as leading barriers to e-mobility uptake: unavailability of charging stations, distance traveled after one full charge, the time required to get a full battery charge, and availability of few models. This finding is in confirms the study by Energy and Petroleum Regulatory Authority (EPRA) in 2020 on integrating Electric two and three-wheeler into existing Urban Transport Modes in Kenya.

Some of these barriers and gaps included high upfront purchase costs, where the comparative costs of EVs' are expensive compared to ICEs; lack of electric mobility model of choice; technological concerns such as driving range, battery life, charging zones; and customer information gaps on long-term benefits of adopting EVs. Some of the proposed options to consider in overcoming these barriers include financial credit access to individuals and businesses migrating or adopting EVs, policy review to incorporate address issues of driving range, battery life, and charging infrastructure. Some of the existing policy gaps identified include the following: (i). Lack of full implementation of The Paris Declaration on Electro-Mobility and Climate Change and the "Call to Action" (ii).

Despite the adoption of the Integrated National Transport Policy, 2009 that proposed the use of lead-free and low-Sulphur fuels crude oils are still the main source of transport sector fuel, with a lack of policy framework to phase out the crude oil products; (iii). Lack of full implementation of Energy Policy 2019 that calls for the adoption of renewable energy; (iv). Lack of full implementation of Environmental Management and Co-ordination Act, 1999 (EMCA, 1999) and Relative Amendment Act No.5 2015 that calls for fiscal incentives including customs and excise waiver in respect of imported goods such as electric motorcycles, spare parts, tax rebates.

General recommendations for gender mainstreaming in the 2/3 wheeler sector with specific focus on e-mobility.

The following are general recommendations:



Enhance access and improve affordability of the ebikes;

connecting the many women that still lack access to electric 2/3 wheelers is of paramount importance to increase uptake. We recommend increased affordability through reduced costs of e-bikes and related services such as charging facilities to serve women.



Affirmative action;

specifically on inclusion of women in public transport work management and governance processes. Female representation in management and decision making roles in transport should be increased to enable them get the power and clout to advocate for gender equity in the sector.



Enhance security and safety in the sector;

as the industry is informal with several unregulated actors including cartels and criminal elements, women workers at put risk especially those who work in late shifts. Policy makers and practitioners should consider the increased risk on women operators compared to their male counterparts and increase security measures. In regard to safety there should be enforcement of the already existing policies on road safety to reduce occurrence of accidents. Addressing other systematic challenges such as a culture of impunity and violence in the informal transport sector, sexual harassment, and abuse, revamping both local and rural road infrastructure, and enforcing the sector regulations and policies and law, will significantly improve opportunities for women and girls' involvement in the sector.



Increase capacity building to equip and train women and girls with the skills needed to participate and thrive in the 2/3 wheeler sector;

Policy makers in education and training sectors should collaborate with practitioners in the public transport industry to ensure access to necessary information regarding career opportunities, nature of work and earning potential in the 2/3 wheeler sector early in the education cycle through outreach activities like symposia, careers talks and mentorship. Consideration should also be made to introduce a course on the technology, operation and maintenance of electric motorbikes in driving schools and in the Technical and Vocational Education and Training (TVET) curriculum.



Movement building;

this can be achieved by establishing networks of women already working or those interested in joining the sector would help amplify their voice and give them visibility in the male dominated industry. The networks can also provide a platform for coaching and mentoring to enhance career development. Affirmative action; specifically on inclusion of women in public transport work management and governance processes. Female representation in management and decision making roles in transport should be increased to enable them get the power and clout to advocate for gender equity in the sector.



Address gender stereotypes in the 2/3 wheeler sector;

policies can be only effective if they also address the underlying factors that prevent women and girls from fully participating in the 2/3 wheeler sector and from enjoying the benefits it offers. This in turns calls for the need to address normative barriers and beliefs and to overcome stereotypes and biases. Efforts should also be made to curb socio-cultural norms that limit women's involvement in the industry by showcasing female role models would help convey the idea that women can also thrive in the male dominated sector. In Tanzania, an organization called Pikiliily in collaboration with the government has continued to train young women as motorcycle mechanics, which has increased access to socioeconomic livelihoods⁵⁰.



Foster women entrepreneurship and innovation;

entrepreneurship skills have become even more important in a world where a greater number of people are empowered with the possibility to start or develop their own business. But risk aversion, scarce access to seed funding and rigid social and economic structures which limit the accumulation of funds, can jeopardize both entrepreneurship and the innovation propensity of women investment in the transport industry. Giving women grants or making it easier for women to access credit can represent another important step towards greater participation of women as investors in the sector.

5.8 Gender Specific Recommendation for various actors

5.8.1 Government and Policy Makers

The following are proposed recommendations for women in the 2/3 wheelers and e-mobility:

- i. Provide reporting channels with clear procedures on how to respond, report, and document sexual harassment cases.
- ii. Government should provide more security in transport terminals where motorcycle taxis and tuk-tuks drop and pick-up passengers/commuters; safeguarding and self-protection measures. Enforcement of law and introduction of tougher penalties for abuse targeted towards women in the 2/3 wheelers, particularly verbal and sexual abuse.
- iii. Participation of women in the planning and design of the transport system can help build capacity within planning agencies and public transport operators to understand the needs and preferences of female commuters.
- iv. Extend tax waivers on Electric motorcycle importation, assembly and spare parts to promote their adoption and use in Kenya.
- v. Fully implement Energy Policy (2019) that promotes the use of renewable energy, including providing incentives for women in the 2/3-wheeler sector.
- vi. Integrate and enforce e-mobility into existing national transport policies and safety regulations. Policy formulation on the sector should be revamped to target not only skills training but also value chains in the transport corridor including assembly and manufacturing plants, wholesale and retail, operation, repairs, and disposal.

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5.8.2 Private and public transport sector recommendations

The following are proposed recommendations for women in the 2/3 wheelers and e-mobility in the private and public transport sector:

- i. Communications campaigns to build awareness on the forms of harassment disseminate information on where to get help and encourage fellow commuters to play an active role in women's safety.
- ii. Offer awards and recognition to celebrate women in the transport industry.
- iii. Provide training on women's safety and security to help operators and management gain a better understanding of women's mobility challenges and safety concerns. The training should tackle various forms of harassment and procedures to follow when an incident is observed or reported.
- iv. Establish a gender scorecard to measure gender equality, safeguarding, and protection of women/girls in the two and three-wheeler transport sector

5.8.3 Donors and International & Multilateral Agencies

The following are proposed recommendations for women in the 2/3 wheelers and e-mobility for donor community, international and multilateral agencies.

- i. Provide grants, fellowships, and scholarship programs to help encourage more women professionals into the public transport industry.
- ii. Provide technical support to government, private, and public sector on the adoption of e-mobility.
- iii. Support technical and financial support to the government to fully implement The Paris Declaration on Electro-Mobility and Climate Change and the "Call to Action"

5.8.4 Academic Institutions

The following are proposed recommendations for women in the 2/3 wheelers and e-mobility for academic institutions.

- i. Adopt affirmative action in the selection of girls in STEM programs as a way of improving women/girls' capabilities in renewable energy engineering, manufacturing, and auxiliary services value chains.

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