Original Article

Gender-Related Dynamics and Factors Influencing Transition to Green Economy Among Rural Communities Within the Forestry Sector

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ABSTRACT

The Green Economy, a methodology that supports the harmonious interaction between humans and nature, has been gaining attention since 1989. It focuses on alternative energy sources, sustainable agriculture, wildlife protection, and environmental policies. Kenya's forest cover is below the global minimum of 10%, and deforestation is increasing at a rate of 5,000 hectares per annum. The research aims to enhance opportunities for green economy development in the forestry sector while minimizing challenges and to bridge the gap between Green Economy development and the forestry sector, address weak policy coordination among ministries and government agencies, and compare green economy statuses with related forest policy analysis. The research uses diverse policies to guide green economy practices in the forestry sector, aiming to interlink them and reduce conflicts. The research was conducted within nine counties in the Lake Victoria Basin Region. The results revealed disparities in gender participation across various preferred green economy activities, with women in rural areas being significantly involved in the initiation of community management programs; however, there was a notable gender disparity in the decision-making process, with women only contributing 20.2% compared to the male counterpart with 79.8%. The main sources of funds for green activities are from internal budgets of organizations (36.5%), businesses (19.1%) and contributions from family and chamas (15.9%), all geared towards building the green economy. The research reveals that the green economy reduces Kenya's natural resource pressure, boosts economic growth, and improves business competitiveness. However, the proportion of different genders in the green economy is undervalued, especially in developing countries. Governments must act to reduce gender inequality in labour markets to ensure the benefits of the green economy are realized. In conclusion, the green economy presents new opportunities for women. Still, they may be deprived of the potential benefits unless governments implement structural reforms to reduce gender inequality in labour markets.

INTRODUCTION

Green Economy dates back to 1989 when David Pearce et al. gave a report on the green economy, "Blueprint for Green Economy," commissioned by the UK Government [1]. The studies interlinked sustainable development with a green economy, whereby resources were viewed as depleted in establishing economic markets [2]. Green economics is a methodology that supports the harmonious interaction between humans and nature and attempts to simultaneously meet the needs of both [3]. Green economy focuses on the impact of alternative energy sources [4], sustainable agriculture, wildlife protection, or environmental policies [3]. Green Economy requires companies to acknowledge and become aware of their corporate social responsibility [5] [6], adopt new processes and lower their environmental impact as much as possible. Gradually, information on the green economy has greatly improved as people have gained more interest on sustainable development, which has been accelerated by various environmental, social and economic challenges such as loss of biodiversity, increased levels of poverty and loss of quality diverse cultures [7]. A green economy focuses on reversing these negative impacts through sustainable development by making wise decisions in producing and consuming goods and services

obtained from the environment to sustain economies and livelihoods that are viewed as components of the ecosystem [8].

Kenya's forest cover is estimated to be 7.4% of the total land area, which is below the recommended global minimum of 10% [9]. However, the country has been undertaking national tree-growing activities to contribute to the 15 billion tree-growing strategy to achieve 30% tree cover by 2032[10]. In recent years, Kenya's forests have been depleted at an alarming rate of about 5,000 hectares per annum [11]. Forest degradation has the potential to jeopardize green economy development as well as hinder the attainment of the Government's Big Four Agenda of food and nutritional security, affordable and decent housing, universal healthcare and manufacturing, as well as Vision 2030, which is the long term national economic blueprint that focuses on the achievement of Sustainable development and achievement of 10% economic growth per year and clean and healthy environments [12]. The vision sets the foundation for Kenya's transformation to Green Economy Pathways. This is clearly elaborated through opportunities in green economy development that are mainly interlinked to forestry bio-enterprises that are non-timber forest products such as herbal medicine and beekeeping enterprises, briquette making, commercial forestry and establishment of

tree nurseries which are sustainably established by incorporating the social, economic and environmental aspects.

The output of this research work will contribute to bridging the gap between Green Economy development and the forestry sector. In addition, weak and fragmented policy coordination among relevant ministries and government agencies, such as low technology, innovation, and Research and Development (R&D) uptake and weak capacity to meet quality and technical standards, will be addressed

The section provides three main goals that focus on the socio-economic, opportunities and constraints, and policy conflicts in achieving a green economy within the forestry sector. To develop strategies for strengthening forest extension and technology transfer in forestry research by analysing Kenya's transition to a green economy. To assess the socio-environmental factors influencing Kenya's transition to Green Economy. To assess opportunities and constraints in achieving green economy development in the forestry sector. To examine conflicting policies in the forestry sector in green economy development

Existing Community Social Structures support the green economy.

Contribution to the green economy through traditional knowledge is key among societies as most communities have diverse, useful cultural knowledge and practices that can be borrowed to promote the development of a green economy. Agenda 21 advocates for the need to adopt diverse, useful cultures for promoting sustainable development. With a green economy as a tool for promoting sustainable development, culture plays a significant role in ensuring sustainable production and consumption of goods and services to support health and well-being among societies [18]. Traditional knowledge passed over generations on using and conserving natural resources must be enhanced to promote sustainability. Integrating these traditional practices within global and national strategies will contribute towards achieving green economy

development by involving policymakers and relevant communities in green economy policy decision-making processes. On the other hand, research and development on integrating cultural practices in the green economy will also contribute to achieving health and well-being among societies since most communities utilize the wealth of cultural knowledge and practice to sustain their well-being and conserve their environments. Bio-enterprise products traditionally used as a source of medicine, income, and food contribute largely to a country's economy and social and environmental pillars, and they continue to be utilized globally [19].

Indeed, cultural aspects are important in green economy development within the forestry sector. Hence, there is a need to enhance research that integrates its potential uses for achieving sustainable development.

Dependence and Over reliance on Biomass Energy by Rural Households

Fuel wood demand in Kenya is 3.5 million tonnes yearly, while its supply is 1.5 million tonnes yearly. Fuel wood accounts for over 70% of the total energy consumption in Kenya [20]. The massive deficit in fuel wood supply has led to high deforestation rates in both exotic and indigenous vegetation, resulting in adverse environmental effects such as desertification, land degradation, droughts and famine. Since 1930, Kenya has lost about 65% of its original standing wood volume [21]. Women and girls tend to be responsible for gathering firewood, affecting their health and keeping girls away from school. The several hours a day spent collecting fuel means that this time cannot be used for other livelihood activities, increasing the time spent as environmental degradation increases [22]. Analysis of fuel types in Kenya by urban and rural areas shows that the most popular fuel types in terms of their various uses are kerosene (80%), charcoal (60%), wood fuel (55%), electricity (37%) and LPG (21%) in that order. The use of fuel wood, charcoal and kerosene in rural areas is higher than in urban areas [23]. However, the use of LPG and

electricity in rural areas is lower than in urban areas [24].

Agriculture, Food Security and Land Ownership

Land as defined by FAO and UNEP [25] [26] is a delineable area of the earth's terrestrial surface, encompassing all attributes of the biosphere immediately above or below this surface, including those of the near-surface climate, the soil and terrain forms, the surface hydrology (including shallow lakes, rivers, marshes and swamps), the near-surface sedimentary layers and associated groundwater and geo-hydrological reserve, the plant and animal populations, the human settlement pattern and physical results of past and present human activity. Land supports life by providing material that supports social, economic, and environmental functioning systems that promote health and well-being.

Over the years, land has been experiencing adverse degradation due to high population pressure on limited land resources, hindering sustainable development. Abdel [27] notes that 75 billion tonnes of soil material are lost through land degradation, leading to massive environmental destruction and increased adverse effects of climate change. FAO [28] emphasizes the need for good governance and policy measures to rehabilitate degraded environments that support life through food production, whereby land provides an important medium for growing food crops.

Green economy development principles promote land management by advocating for sustainable measures for conserving land resources, such as sustainable consumption and production (SCP) principles, polluter-pays-principality, participatory principle, and good governance [11]. Resource users are also cautioned against degrading land resources used in their day-to-day activities as they produce goods and services to ensure that future generations also have access to them.

Policy conflicts in achieving a green economy within the forestry sector.

The research focused on assessing how these opportunities in green economy development in the forestry sector can be enhanced among diverse stakeholders while minimizing challenges hindering green economy development. The research utilized the following policies among others that guide green economy practises in the forestry sector such as:

- The Constitution of Kenya (2010)- It requires the Country to increase and maintain tree cover at a minimum 10% of the total land area (Article 69 (1) (b)

- The Kenya Vision 2030- It places the environmental sector in the social pillar and emphasizes on the need to conserve natural resources to support economic growth and to increase area under forest such as the water towers to 10% by 2030.

- Forest Conservation and Management Act 2016 - Section 6(3)(a)(iii); focuses on increasing tree cover to 10%

- National Climate Change Response Strategy (2010) – The strategy provides for the various forestry roles in climate change mitigation and adaptation

The findings shall continue to be applied to improve the forestry sector through transformation to Green economy development.

Achieving sustainable development requires a well-balanced economy that values social and environmental issues. Ecosystems face risks due to the increasing rates of depletion of natural resources to satisfy human needs and want [13]. Hence, a robust regulatory framework is important for effectively implementing and managing green economy policies that will improve well-being by combating global climate change, energy insecurity, and ecological scarcity. Diversity in market facilitation will also be achieved to support market institutions and participants in encouraging green economic development, with great support from policies

that can be used to build and maintain the market infrastructure, including policies within various sectors.

METHODOLOGY

Study Site

The main study sites are located in the Lake Victoria Basin region, where ten main counties were surveyed, mainly: Busia, Siaya, Homa Bay, Kisii, Nyamira, Migori, Kakamega, Vihiga, Bungoma, and Kisumu Counties. The Counties were selected since the Lake Victoria Basins Eco-region Research Programme (LVBERP) aligns with most counties in the Lake Region Economic Block (LREB).

Figure 1: Study area showing counties visited
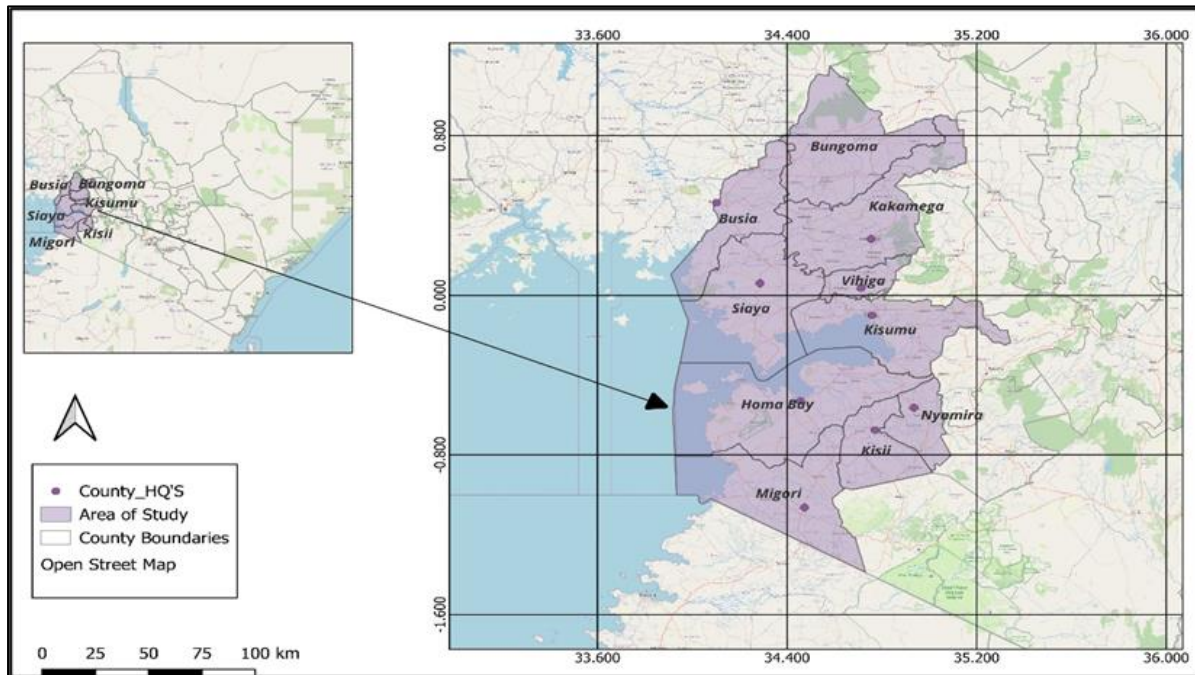
Research Design

The section focuses on descriptive design that utilized surveys to conduct key informant interviews and Focused Group Discussions [14]. Literature reviews from previous work related to the topic were also adopted through a desktop approach to gather useful information about green economy development. The research design enabled systematic information collection among the community implementers of green economy activities within various counties within the Lake basin. Focus Group Discussions and Interviews were conducted to identify the counties perception of the green economy and establish the activities undertaken in the selected counties. In addition, key institutions from both Private Public Partnership and Public Organizations were selected from the case study areas engaged to give their views on green economy development.

Sampling and analysis

The stakeholders were determined during the baseline survey from the selected counties, and a sample size was selected based on accepted standard procedures. Purposive sampling was used in the selection of the study regions (counties), which were Busia, Siaya, Homa Bay, Kisii, Nyamira, Migori, Kakamega, Vihiga, Bungoma and Kisumu Counties, whereby Kenya Forest Services, Water Resources Users Associations, Water Resources Management Association, Community Forest Associations, Farmers, Women and Youth groups from these counties were randomly selected. The research work focused on the activities of various key actors within the international organizations and national institutions that have interlinkages with green economy development and also deal with policy issues related to green economy

development. Data was analysed using descriptive statistics and inferential statistical methods in SPSS software.

RESULTS AND DISCUSSION

The green economy is viewed as reducing pressure on Kenya's natural resources and helping the country spur economic growth. It reduces Kenya's climate and environmental footprint and safeguards its natural capital. The green economy also improves business competitiveness, which spurs growth and creation of employment. Several social and economic factors have addressed Kenya's adoption of the green economy. Social factors that influence green economy development within the forestry sector have been largely addressed within the seventeen sustainable

development goals, among them being goal 1, eradication of poverty, goal 2, eradication of hunger, goal 3, enhancing good health and well-being, goal 4, provision of quality education, goal 5, that addresses gender equality, goal 10 reduced inequality among others [15]. The research assesses the forestry sector's social factors influencing green economy development.

Proportion of different Genders in Green economy

The results indicate most women are engaged in activities that impact their household economic status positively, like a tree growing and fruit planting (78.6%), Poultry farming (75%), waste management (100%) and disaster management (100%) among other activities (*Table 1*).

Table 1: Preferred Green economy activities, proportion (%) in green economy

Preferred Green economy activities	Proportion (%) in green economy		
	F	**M**	**Chi-square test (χ_p N=12)**
Beekeeping	30.0	70.0	16.2(0.02)
Crop production	57.9	42.1	50.8(0.01)
Disaster management	100.0	0.0	12.5(0.01)
Education & Research	25.0	75.0	23.0(0.01)
Environment conversations	8.3	91.7	123.0(0.01)
Extension services on agroforestry	30.0	70.0	6.8(0.02)
Fish farming/ponds	0.0	100.0	15.0(0.01)
Livestock production	0.0	100.0	123.0(0.02)
Poultry farming	75.0	25.0	120.0(0.03)
Sand harvesting	25.0	75.0	123.2(0.07)
Tee nursery	0.0	100.0	128.7(0.08)
Tree and Fruits planting	78.6	21.4	120.9(0.09)
Waste management	100.0	0.0	111.9(0.06)
Mean	**41.0**	**59.0**	

Key: F = Female, M = Male

Women worldwide are engaged in different activities, from providing basic necessities for their families to running businesses and countries. However, their contribution to societies and economic growth is unrecognized and undervalued. The green economy presents new opportunities for women, but there is a possibility that they will be deprived of the potential benefits arising from the green economy, especially in developing countries, unless the governments act and initiate structural reforms which will reduce gender inequality in green economy development. Gender empowerment plays a significant role in promoting a green economy within the forestry

sector, whereby women and men are largely involved in forestry bio-enterprises that are sustainably obtained and produced to serve sustainable economies. However, it is important to note the need for participation and inclusivity of both genders due to the significant roles that each play in contributing to the overall agenda of promoting global sustainable development. Forestry resources provide diverse resources that support the health and well-being of both genders. In Kenya, 42% of the Gross Domestic Product (GDP) and 70% of the overall employment is derived from the natural resources-related sectors; hence, both genders need to promote participation

and inclusivity to contribute to the overall agenda of promoting global sustainable development. This will, in turn, trickle down to the achievement of reducing poverty and promoting gender equality.

Participation of Rural women in the green economy

The results indicate women play a major role in initiating community management programs (91.6%), Planning of program activities (78.7%), and in the preparation of community group constitution (77.4%) in comparison to the male counterparts in the same roles (*Table 2*).

Women are consumers, workers, and producers; in this context, they play a crucial role in benefiting the growth of a green economy and reaping the benefits [16]. Women are disproportionately affected by climate change and environmental degradation as they tend to be more dependent on common resources such as water, food and wood and more vulnerable to the negative impacts of natural resource depletion [17]. Women also constitute approximately 70 per cent of the 1.3 billion people living on less than US$1 a day, and due to persistent gender stereotypes, the role of women is not sufficiently recognized in terms of economic development, especially in the Green Economy. Women should be encouraged to get involved in economic development to promote gender equality and social progress.

Therefore, for the successful implementation of green economy practices, both genders must be incorporated into the forestry sector's leadership, management, and decision-making processes.

Table 2: Role of Women in Green economy and proportion (%) of different gender participation

Role of Women in Green Economy	Proportion of different gender participation (%)		Chi-square test
	Female	Male	(χ_p)
Initiation of Community Management Programs	91.6	8.4	52.5(0.01)
Planning of Program Activities	78.7	21.3	62.5(0.01)
Decision-Making Process	20.2	79.8	72.5(0.02)
Preparation of Community group Constitution	77.4	22.6	82.5(0.02)
Involvement in the Management of Activities	72.5	27.5	22.5(0.01)
Participation in monitoring and evaluation of activities	64.5	35.5	42.1(0.03)
Drawing Calendar of Events	56.1	43.9	52.1(0.01)
Participation in Tree Planting	18.5	81.5	72.5(0.01)
Daily running of group activities	41.5	58.5	82.1(0.02)

Support to Green Economy By Different Structures

The main sources of funds (*Table 3)* for green activities were the internal budgets of organizations (36.5%), businesses (19.1%) and contributions from family and informal cooperative societies *"chamas"* of organizations (12.7%).

The organizations which were surveyed indicated that social activities that promoted green practices included but were not limited to sporting, national celebration, cultural events, and religious celebration activities, while climatic and environmental activities were mainly tree planting, rehabilitation of degraded sites, tree nursery activities and control of pest, diseases, invasive tree and flood.

Opportunities in Green Economy Development

The following are the opportunities that exist among the organizations that practice green economy activities (*Table 4*).

Table 3: Main Source of funds for the promotion of green economy among rural communities

Sources of funds	Type	Rank	n	%
Budgets of Organization/Institutions	Retained earnings	1	23	36.5
Sources from Business of Families	Retained earnings	2	12	19.1
Family, Chamas, contributions, gifts	Savings	3	10	15.9
Government Funding structures	Government sources	4	5	8.0
Tree nursery and partners/farming Produce from production	Business expansion scheme funds	5	4	6.3
Grants/Donors/Research funds	Donations	6	3	4.8
NGO Support/Empowerment	Donations	7	2	3.2
KCSAP Project	Donations	7	2	3.2
Others	Donation	9	1	1.6
World Bank/International Monetary Funds/Africa Development Fund Bank	Bank borrowing	9	1	1.6
Total			**63**	**100**

Table 4: Green Economy opportunities among rural communities

Green Economy Opportunities	No of respondent	Percentage (%)
Cooperation/collaboration/Partnerships	12	13.79
Management Act/ policy/leadership/documents/support	12	13.79
Green Projects/Innovations/Activities	11	12.64
Water resources/job opportunities/tourists resources/agri. Products	8	9.20
Training personnel/ Staff/ Capacity/ skills/Knowledge/Human capital/Experiences	5	5.75
Infrastructure	5	5.75
Stakeholder Engagement	4	4.60
Research Opportunity/organize and registered groups	4	4.60
Donor support/Financial support/Aid	4	4.60
Conducive environment	4	4.60
Tree planting/tree nurseries establishment	4	4.60
Available land/Demo land/degrade land	3	3.45
Creation of employment	2	2.30
Agricultural produce and increase	1	1.15
Business opportunities	1	1.15
Inter university exchange program	1	1.15
Renewable energy	1	1.15
Cultural day practices/sports/music festivals	1	1.15
Good health	1	1.15
An alternative source of energy	1	1.15
Extension services	1	1.15
Nearness to urban centres	1	1.15
Total	**87**	**100.0**

The findings from the survey indicate that a high percentage of the selected organizations, ranking at 13.9%, have partnerships from diverse stakeholders and policy-supporting documents that provide great opportunities for promoting a green economy within the forestry sector while creating employment, business opportunities, agricultural produce, inter-university exchange program, renewable energy, cultural day practices, good health, an alternative source of energy, extension services and nearness to urban centres ranked the least among the opportunities at each at 1.15%.

Moving towards a green economy has the potential to achieve sustainable development and eradicate poverty with speed and effectiveness. However, climate change and the depletion of

natural resources are some of the greatest challenges facing our country, and they require all sectors to participate in reversing the trend of increasing global greenhouse gas emissions. Green growth is about reconciling and reinforcing various aspects of economic, environmental and social policies. This is achieved by considering the full value of natural capital and recognizing its essential role in economic growth. A green growth model promotes a cost-effective and resource-efficient way of guiding sustainable production and consumption choices and could lead to the following outcomes if designed and implemented effectively [1]. Therefore, we begin by recalling a generic set of green growth outcomes that developing countries increasingly intend to pursue. The World Bank [29] recognizes that Developing countries play a significant role in achieving global green growth in two primary ways. Firstly, environmental degradation's potential social and economic impacts are particularly important for developing countries. Notably, these countries are the most vulnerable to climate change, hence being more dependent than developed countries on exploiting natural resources for economic growth [30]. Also, many developing countries face severe economic, social and ecological threats, from energy, food and water insecurity to climate change and extreme weather risks. They also face risks of premature deaths due to pollution, poor water quality and diseases associated with a changing climate. All of these factors undermine their development [31].

Secondly, although today, most developing countries contribute only minor shares to global greenhouse gas (GHG) emissions compared to the OECD and major emerging economies, they will increase their emissions if they follow conventional economic growth patterns. Increasingly developing countries are becoming sources of global economic growth, emissions and, with these, more intensive use of natural resources [32].

Table 5: Challenges and Barriers to Green Economy activities within rural communities

Challenges and barriers	f	%
Shortage of skilled workers	30	38.96
Cost of implementation	29	37.66
Inadequate information	9	11.69
Government policies and their implementation cost	5	6.49
Cost negative attitude, cultural beliefs, poor attitude, poor agricultural practice	2	2.60
Training programs shortage	1	1.30
Poor collaboration and partnerships	1	1.30
Total	**77**	**100.00**

Shortage of skilled workers ranked the highest at 38.96% (*Table 5*) among the selected organizations as the major challenge that hinders green economy development, while training and poor collaborations ranked the least each at 1.30 % as limitations to achieving green economy within the forestry sector through gender participation.

CONCLUSION

Green economy activities within the forestry sector need to be aligned with the Social, Environmental and Economic pillars of sustainable development. This is due to gender overdependence on forestry resources worldwide. Promoting participation and inclusivity of both genders in forestry-related activities is important to note that promoting participation and inclusivity shall contribute to attaining high sustainable economic growth within the forestry sector. Therefore, additional advanced research on gender inclusion must be undertaken to implement green economy practices successfully within the forestry sector.

Recommendation

The research findings recommend that gender involvement is needed through participatory and

consultative approaches, which will contribute to bridging the gap between the green economy within the forestry sector and gender inclusion. Capacity building shall contribute immensely towards creating awareness across all genders and diverse stakeholders and organizations on the importance of promoting a green economy within the forestry sector.

The attainment of adequate financial resources and the promotion of technology transfer shall contribute to the transition between gender and green economy development within the forestry sector. The research work also recommends that there is a need to integrate green economy within the forestry sector activities by considering gender interactions within the diverse value chains that are found within the forestry bio-enterprises.

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Data Availability

The data sets used and/or analysed in the study are available on request

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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