



Women Environmental Conservation Strategies and the Community Organization Social Work Method in Voi Sub-County, Kenya

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Abstract: Globally, women have played a crucial role in environmental conservation initiatives, yet they have been underrepresented in environmental decision-making. Voi sub-County continues to experience the devastating effects of deforestation and land degradation. This study explored the strategies that enhance the participation of women in environmental conservation initiatives relating to community organisation a method of social work in Voi sub-County. Ecofeminist and participation theories guided the research and adopted mixed methods sequential explanatory design. The study targeted a population of 8631 women in Mbololo and Ngolia wards, in Voi sub-County. A sample size of 400 participants was selected using proportionate random sampling technique which was determined using the Yamane formula. Data was collected through primary and secondary methods. The instruments included; questionnaires, interview guides, Focus Group Discussions, and a comprehensive review of literature. Quantitative data was analysed through descriptive statistics using SPSS version 27. Qualitative data were categorized into themes and sub-themes. The findings show that, social work is paramount since it promotes social transformation, development, community cohesion, and empowerment of women. The study recommends awareness creation on environmental issues, the involvement of women in training programmes, adoption of agroforestry and ecotourism, collaborative management of the environment, and County tree planting activities.

Keywords: *Women, Environmental Conservation Strategies, Community Organization, Social Work*

1.1 Study background

The ever-growing human population and rapid technological innovations consistently strain the Earth's ecosystems and natural resources (Subramanian, 2018). Over-exploitation of a nation's resources, including land, water, and fuel, has led to the deterioration and depletion of these resources, largely

due to industrial pollution, soil erosion, deforestation, and urbanisation. For this reason, it is critical to protect and enhance natural resources, the environment, and the ecosystem. Women have direct interaction with natural resources such as fuel, food and fodder, forest, water, and land, particularly in rural regions where a significant population relies on natural resources (Singh & Singh, 2017). Women frequently utilise these resources to fulfil the basic needs of their families. Prior to the 18th and 19th centuries, women were often perceived as having no role in environmental protection and promotion and were marginalized in various spheres of social life. However, as they gained awareness of their rights and responsibilities and developed a heightened awareness of their surroundings, they purposefully sought to advocate for environmental preservation and combat environmental degradation. Women play a significant role in managing natural resources at the household and community levels. However, they are disproportionately affected by the negative impacts of environmental degradation (Segerson, Kling & Bockstael, 2022).

Worldwide, women actively contribute to environmental management activities in diverse sectors, such as agriculture, fisheries, and forestry, while also playing a vital role in initiatives aimed at climate change adaptation and mitigation. Nevertheless, women's participation and representation in decision-making processes that pertain to them and their families' environmental well-being are often restricted (Lau et al., 2021). The conventional gender roles that assign men to commercial spheres and women to domestic spheres have placed women at a disadvantage, limiting their ability to participate in environmental decision-making processes. Men tend to use natural resources for commercial purposes more frequently than women, resulting in their activities being more visible to policymakers, economists, scientists, and planners due to their contribution to the formal economy (Wangchuk et al., 2021). Women, as farmers and household providers, are engaged in the daily management of natural resources, which gives them unique and valuable knowledge about the environment (Manimekalai & Sindhuja, 2019). Moreover, as women interact with the environment and natural resources in their daily activities, they understand environmental issues, and their knowledge is imperative in addressing climate change.

Women are primary environmental stakeholders and use natural resources more than men (Hedelin, 2017). Women founded many environmental and resource protection movements. For instance, in India, Sunderlal Bahuguna and his wife mobilised women and founded the Chipko Movement in 1973 to stop government commercial loggers from cutting down trees in Himalayan forests by having women hug trees (Gadgil, 2021). This movement polarized women's social status, they demanded equal decision-making rights with men (Keith et al., 2020). The 1979 Silent Valley Campaign opposed the Kerala Government's dam for a hydroelectric power project in India's Silent Valley Forest (Nirmala & Arul, 2017). The 1983 Karnataka Appiko Movement was another important social movement where the government's plan to clear forests for industrial expansion sparked this campaign (Hegde & James, 2018).

In the United States of America (USA), Winona LaDuke serves as the executive director of Honour the Earth, an indigenous environmental advocacy organization, and is also a founder of the White Earth Land Recovery Project in her community (Wilson, 2017). She is actively involved at both national and international levels, advocating for climate change, renewable energy, and environmental justice in partnership with Indigenous communities. Over several years, she has been actively engaged in various native and environmental protest movements, demonstrating her commitment to advocating for issues related to Indigenous communities and environmental justice. She has played a key role in organising public opposition to the Dakota Access Pipeline project and has emerged as a prominent spokesperson for a united traditionalist indigenous political front that advocates for the protection of Native lands in

North America from exploitative large-scale industrial enterprises. Her advocacy extends to culturally based sustainable development strategies, renewable energy, and food systems, as she champions the rights and well-being of native custodians of these lands (Wolf, 2019).

In Sweden, women make up 64% of local government workers, and 45% of the Swedish parliament has been made up of women since the 2010 election (Borchorst & Siim, 2018). Sweden has a profound feeling of nature rooted in both its identity and customs, which has played a significant influence in developing the country's broad agreement to safeguard the environment, particularly for women. It became considerably simpler to enshrine environmental legislation when the Swedish people's opinions and ideology were transformed. Women working in institutions helped to safeguard the global environment by advocating for prohibitions on nuclear energy and industries that harm the local ecosystem (Gericke et al., 2020).

In Brazil, Marina Silva, a prominent advocate for the Amazon Rainforest, worked alongside Chico Mendes, who was tragically assassinated while defending the rainforest in 1988 (Shanley et al., 2018). Silva and Mendes jointly led demonstrations in the 1980s to safeguard the rainforest from government control. After Mendes was killed, Silva transitioned into politics and actively advocated for environmental protection, sustainable development, and social justice. Notably, during Silva's political career, deforestation rates decreased by 59% from 2004 to 2007 (Raimi, 2019).

Africa faces land degradation, deforestation, biodiversity loss, and significant climate change vulnerability (Steiner, 2019). Azeiteiro et al. (2021) note that Africa, home to 15% of the world's population and certain iconic species, has the potential for sustainable expansion and environmental conservation. Women in Africa are engaged in conservation activities and the management of the environment. However, they are ignored as environmental partners and are not given the attention they deserve. Land, forest, water, and fodder are also essential to African women's social and economic activities (Parpart, 2019). African women have no control over land ownership or the capital they produce from environmental resources and labour (Goyke et al., 2019).

In sub-Saharan Africa and the Caribbean, women play a critical role in producing 80% of basic foodstuffs, while in Asia, they contribute to fifty to ninety per cent of the labour force for rice cultivation. In Nigeria, specifically in Adamawa state, 60% of women are engaged in farming. Additionally, women in Imo state, the Gurei district of Adamawa state, and many other parts of the country have been reported to contribute significantly to food production, even undertaking traditional male agricultural tasks (Kim et al., 2019). Moreover, Yanquoi et al. (2018) observed that women in Liberia and Sierra Leone enrich the soil through their daily activities, such as cooking and cleaning, by adding organic matter such as ash, potash, and leftover food and stalks to form African Dark Earth. This practice is based solely on traditional knowledge and is believed to improve soil quality.

According to estimates, wildlife generates more than 70% of Kenya's tourism revenue and accounts for around 5% of the nation's overall Gross Domestic Product (GDP). Approximately 70% of the country's total domestic energy is derived from wood-based sources. Kenya's water is highly dependent on Kenya's five Water Towers, which together encompass more than a million hectares of montane forests. The Water Towers in Kenya produce over 15,800 million cubic meters (m³) of water each year, making up more than 75% of the country's renewable surface water resources, according to estimates. Deforestation poses a serious threat to Kenya's water towers (Kogo et al., 2019). Timber, fuel wood and charcoal harvested thus provide poor people with an opportunity to generate immediate

and substantial cash revenue, while also granting access to fertile land for productive use. These serve as important economic inducements for deforestation. Deforestation, however, also has a significant negative impact on Kenya's economy. It also has an adverse effect on a number of other economic sectors in addition to Kenya's water-dependent industry. This is because, among other things, it has a negative impact on Kenya's water production. These sectors include the Agricultural, forestry, and fishing sectors, the Electricity and water sectors, the Hotels and accommodation sectors, and the public administration and defence sectors (Ototo & Vlosky, 2018).

In Kenya, Ondiba and Matsui (2021) point out that, women interact extensively with the physical environment in their daily activities. They interact with the environment as they cultivate their fields, search for fuel wood, fetch water, forage for subsistence food, and maintain their homes, which results in more frequent interactions with the environment compared to men. In 1977, Professor Wangari Maathai founded the Kenyan Green Belt Movement (GBM), which placed a strong emphasis on the value of women's voices and perspectives in environmental preservation. The foundation has planted over 51 million trees in Kenya. Ochieng (2017) asserts that the Green Belt Movement (GBM) operates at the local, national, and global levels to encourage environmental conservation, improve climate resilience, and empower communities, particularly women and girls, in order to promote democratic participation and sustainable livelihoods.

According to the TTCIDP Report (2013-2017), Taita Taveta County has a total of 78 forest parcels, out of which 52 parcels are still pending gazettement. The natural forests in Taita Taveta County play a crucial role in supplying water to both local communities and areas downstream. However, the challenges of a growing population and shrinking land sizes, coupled with limited alternative economic opportunities, pose significant threats to sustainable resource management in the region (Borghesio et al., 2017). The destruction of habitats and environmental degradation are the main factors contributing to the decline in biodiversity in this County. The demand for more agricultural products, timber, and charcoal has led to the rapid destruction of natural forests as stated by Mitchard (2018).

In Taita Taveta County the human population experienced a substantial increase, surging from 111,000 people to over 300,000 people during the period spanning from 1969 to 2009 (KNBS, 2019). As of 2019, the population of Taita Taveta County had significantly grown to 340,671 individuals, and the population densities varied, ranging from 14 people per km² to over 117 individuals per km². The expanding human population and rising living standards have resulted in an increased demand for land and natural resources, leading to the conversion of natural and semi-natural ecosystems into highly cultivated agricultural land, tree plantations, and human settlements (Dahliah & Nur, 2021).

1.2 Statement of the Problem

Wekesa et al. (2021) conducted a study in Taita Taveta County, that revealed a significant decline in forest cover between 1973 and 1987. Forest fragments such as Chawia, Fururu, Mbololo, Ngangao, and Vuria experienced varying levels of loss during this period. The depletion of forests can be attributed to the tragedy of the commons, where individuals exploit shared resources for their own interests (Mildenberger, 2019). Unregulated extraction of forest resources by local communities led to deforestation and land degradation, resulting in habitat loss for wildlife and increased conflicts between humans, livestock, and wildlife. Mining activities also contributed to soil degradation, food insecurity, and impoverishment in the County (TTCIDP Report, 2018-2022; Mwachandi & Mwachanya, 2020). Women in Voi sub-County, Taita Taveta County are disproportionately affected by climate change, prolonged droughts, landslides, and changing rainfall patterns, which are consequences of forest destruction and land degradation (Mwikamba et al., 2022). Deforestation, agriculture, human settlements, charcoal production, grazing, and infrastructure development have led to adverse effects such as prolonged droughts, food shortages, desertification, floods, infrastructure damage, gully formation, and increased mosquito populations causing malaria (Icheria, 2019). Women in the patriarchal community of Voi sub-County have limited access to decision-making power (Waiganjo, 2019). Women's daily workload prevents them from getting enough time for decision-making processes, especially on environmental issues, policy formulation, and execution. Despite women being responsible for most of the work on farms, they have limited or no access to weather forecasts, climate information, and agricultural technologies (Juma, 2017).

The devastating effects of deforestation and land degradation continue to impact Voi sub-County. Habitat degradation has disrupted traditional wildlife-watching locations in Tsavo National Park, while reduced crop and livestock yields have resulted in severe food insecurity (Ayeni, 2018; Abera et al., 2022). Encroachment from mining, construction, settlements, and agriculture has encroached upon traditional rangelands, disrupting wildlife corridors and exacerbating conflicts between humans, livestock, and wildlife. Failure to address desertification, and deforestation, and promote afforestation could lead to critical challenges such as food insecurity, flooding, famine, malnutrition, and increased susceptibility to diseases like malaria. The heavy reliance on charcoal and resulting air pollution further compounds the health risks, particularly in Taita Taveta County, where forests are vital resources used and accessed differently by both genders (Mwakesi et al., 2020).

In order to promote social justice, environmental justice, and social change, social work professionals contend that it is crucial to consider the role of women in addressing environmental problems. However, there is a paucity of literature on strategies to enhance women's participation in environmental protection, conservation, and management initiatives, particularly in the context of community organization as a method of social work in Voi sub-County.

1.3 Specific Objective

To explore strategies that can enhance the participation of women in environmental protection, conservation, and management initiatives in relation to the community organization method of social work in Voi sub-County, Taita Taveta County.

1.4 Justification

Women in Voi sub-County are marginally involved in environmental conservation, protection, and management. They are connected to the environment on a daily basis and are adversely affected by the devastating effects of deforestation and land degradation. Women depend on environmental resources such as land, water, fodder, and forest for their livelihood. Taita Taveta County is suffering from the

effects of deforestation and land degradation such as prolonged drought, floods, food insecurity, and drying up of seasonal rivers. The priority of the County is on development projects, which are being pursued at the expense of the communities' livelihoods. Forests in Taita Taveta are threatened by massive logging of timber, unsustainable exploitation of forest resources and the transformation of forest to alternative land uses such as agriculture, construction of roads and buildings for development purposes, and human settlement.

Taita Taveta County is a patriarchal community where men have a dominant role in decision-making while women are caregivers. Women are marginalised in decisions related to the conversion of forests and the environment for alternative land purposes, and they bear the brunt of the outcomes of the decisions that are primarily made by men regarding environmental concerns (Mkuzi, 2020). Therefore, this study sought to explore the strategies in relation to the community organisation method of social work that can enhance the participation of women in environmental protection, conservation, and management initiatives in Voi sub-County, Taita Taveta County.

1.5 Literature Review

1.5.1 Theoretical Framework

Ecofeminist Theory

Ecofeminist theory emphasizes the ways both nature and women are treated by patriarchal (or male-centred) society. The main argument of this theory is that the domination of women and the degradation of the environment are consequences of patriarchy and capitalism (Helbert, 2021). Ecofeminism uses the basic feminist tenets of equality between genders, a reevaluation of non-patriarchal or nonlinear structures, and a view of the world that respects organic processes, holistic connections, and the merits of intuition and collaboration. Ecofeminist theory argues that a feminist perspective of ecology does not place a woman in the dominant position of power, but rather calls for an equalitarian, collaborative society in which there is no one dominant group (Odrowaz-Coates, 2021). Ecofeminist theory is therefore an antidote to environmental destruction through nurturing the environment. It also advocates for the protection of the environment and full, equal rights for women and their participation in environmental discussions and decisions. Furthermore, ecofeminists advocate for an alternative worldview that values the earth as sacred, recognizes humanity's dependence on the natural world and embraces all life as valuable. However, critiques of ecofeminism argued that the theory tends to focus solely on the relationship between women and the environment while disregarding men and their environmental relations (Pease, 2019). To address this weakness, a second theory was adopted to fill this theoretical gap.

Participation Theory

Participation theory emphasizes that women's participation is mostly encouraged because they would bring to the decision-making table their concerns resulting from their personal experiences. Their participation would result in them acquiring self-confidence and the power to voice their opinions about the things that matter to them and to bring about changes in the spheres they are most concerned with. The social capabilities approach of participation theory recognizes that inequalities, social hierarchies and discrimination are characteristics of everyday face-to-face relations and interactions within local communities. It emphasizes empowerment, equity and the voice of gender and class in society (León-Fernández, 2018). Participation theory encourages community participation in the management of local resources as this improves the effectiveness of various development projects. Community involvement results in the regulated use and conservation of resources (Bell & Reed, 2022). In line with this study, the involvement of women in environmental conservation could result in

the regulated use of natural resources and effective conservation of the environment. Participation theory argues that community involvement in environmental management enables the sharing of responsibilities of management with the primary user group and ensures the sustainability of resources by encouraging prudent practices (Conceicao et al., 2020).

Participation theory attempts to fill a gap expressed in the ecofeminism theory that its critics tend to feel that ecofeminism places too much emphasis on women, neglecting the environmental relationships and perspectives of men, who are rendered invisible in the discourse (Sultana, 2021). To this extent, participation theory suggests that decision-making processes should involve all stakeholders, regardless of gender, who require collective action to be taken. This approach places an emphasis on the importance of inclusivity in decision-making.

Participation theory avers that the involvement of stakeholders in decision-making processes can enhance inclusivity and generate ownership of development processes, which, in turn, leads to more sustainable impacts (Srithong et al., 2019). Gumede and Nzama (2020) note that the principles of people-centred development, self-reliance, capacity building, equality, and empowerment are fundamental components of participation theory. Lasso and Dahles (2021) contend that the foundation of public participation lies in the principles of free speech, the right to a healthy environment, and a secure livelihood. Nonetheless, they argue that a well-defined legal framework is essential to exercise these rights.

1.5.2 Review of Empirical Studies

Community organization is an important social work intervention method, especially in relation to gender-inclusive environmental management. This is because it involves a process whereby a community identifies its environmental needs or objectives, prioritizes them, builds determination and confidence to address them, seeks both internal and external resources to manage them, and fosters cooperative and collaborative attitudes and practices within the community ultimately promoting responsible environmental management. Social workers understand the crucial significance of collaboration, participation, empowerment, and relationships, and acknowledge that relationships can be instrumental in driving social change. Additionally, social workers assist their clients, which in this case would be the community, in cultivating and strengthening meaningful relationships within their own lives and among various groups in the community (Bhattarai, 2020).

Community organisation is a powerful strategy for social workers to address social and environmental problems and improve the well-being of women and families within the communities in Taita Taveta County. By working collaboratively with community members, social workers can help identify and address issues such as deforestation, land degradation, the exclusiveness of women in environmental decision-making, human-wildlife conflict, livestock-wildlife conflict, huge gullies, healthcare access, and diseases such as malaria. By adhering to the principles of community organization, social workers can empower community members to take ownership of the solutions and work toward sustainable change that benefits everyone (Antonopoulou, Killian, & Forrester, 2017).

A study conducted by Mago and Gunwal (2019) indicates that women have direct contact with natural resources such as food and fodder, fuelwood, water, forest and land, especially in rural areas where the majority of the population resides and directly depends on natural resources for their livelihoods. In addition, women play a substantial role in managing natural resources on family and community levels and are most affected by environmental degradation. Women also take on leadership roles in

environmental conservation and management across the globe, with notable figures including Professor Wangari Maathai from Kenya who founded the Green Belt Movement in 1973, Rachel Carson from the USA who wrote the book "Silent Spring" in 1962, inspiring grassroots environmental movements, Medha Patkar who spearheaded the Narmada Bachao Andolan, Menaka Gandhi who is an animal rights activist and encouraged couples across India to plant fruit trees in 2020, and Vandana Shiva who founded the Navdanya movement in 1991, all from India. Additionally, Tessa Khan, based in the United Kingdom, co-founded the Climate Litigation Network with the Urgenda Foundation to pursue climate change cases globally in 2019. Therefore, involving women in training programmes, planning, implementation, and decision-making is essential for initiating the conservation of natural resources and the protection of the environment. Nations worldwide have recognized the global dimension of several environmental issues, including climate change, ozone depletion, hazardous waste dumping, destruction of biological resources and forests, and the effects of desertification (Singh & Singh, 2017). As a result, it is crucial for countries to implement measures to prevent environmental degradation and promote environmental conservation and management. Hence, the researcher sought to investigate ways to increase women's participation in initiatives related to environmental protection, conservation, and management through the community organization approach of social work in Voi sub-County, Taita Taveta County.

Al-Makhamreh et al. (2018) conducted a study on social work field training for the community: a student self-directed approach in the environmental domain in Jordan. Study findings highlighted the effectiveness of students' self-directed projects in cultivating culturally competent practices; ensuring sustainable development; and providing evidence-based knowledge on social work practice involving environmental issues. Shrestha (2017) found that community involvement and mobilization in wetland conservation in Nepal increased the nation's resource management and economic resource use capabilities. Cureg et al. (2016) found that ecological education campaigns changed people's attitudes toward Philippine crocodile conservation and raised awareness.

Mulatu and Hunde (2019) conducted a study to provide empirical information on the role of agroforestry in the conservation of flora and fauna biodiversity and climate change mitigation and adaptation in Ethiopia. The results revealed that agroforestry has played a greater role in the conservation of fauna and native flora diversity and mitigation of carbon dioxide (CO₂) than monocropping and open cereal-based agriculture but less than natural forest. Provision of numerous ecosystem services such as food, fodder and fuel wood, income sources, enhancing soil productivity, protection against pests and increased resistance to diseases help the community to sustain changing climate effects. On the other hand, Alemayehu (2020) sought to uncover the role of empowering women and achieving gender equality in the sustainable development of Ethiopia. The study showed that the role of women across different dimensions of sustainable development is less reflected in the country. The political sphere of the country is, by and large, reserved for men alone. The place of women in society is also relegated to contributing minimally to the social development of the country. In 2020, the FAO and UNDP conducted a study in Kenya to evaluate the cost-benefit of agroforestry practices and soil and water conservation for climate change adaptation. The findings indicate that these adaptation options are financially viable since they result in on-farm net benefits through reduced soil erosion, improved water retention, increased crop yields, and ultimately higher incomes.

In this study, the researchers adopted the community organization approach of social work as a method of intervention, to explore strategies such as agroforestry, education, and ecotourism, that could

enhance women's participation in environmental conservation and management initiatives in Voi sub-County, Taita Taveta County.

In Taita Taveta, Wekesa et al. (2021) indicate that ten-metre-wide agroforestry has been established on private farmlands next to the forests. Intercropping of *grevillea robusta* (an exotic tree species) with food crops like maize and beans is planted on those farmlands to enhance soil fertility and prevent soil erosion. Likewise, community tree nurseries have been created in Chawia, Ngangao, and Vuria forests to grow seedlings of native tree species for restoring degraded forest areas within the forest fragments. Social workers also work to develop the capabilities of their clients, empowering them to acquire social competencies. They strive to foster social and group unity among community members to effectively address the social issues at hand (Choi, 2017) such as the marginalization of women in environmental decision-making processes and issues of deforestation and land degradation.

The Environmental Education Programme is an ongoing process that enables individuals to develop an understanding of their environment and acquire the necessary knowledge, values, skills, experiences, and motivation to address current and future environmental issues. The program aims to empower individuals to act both individually and collectively to meet their needs without compromising the needs of future generations. The Africa Environmental Education and Training Action Plan (AEETAP) (2015-2024) recognizes the importance of enhancing environmental education and training. The plan prioritizes formal and informal education, capacity-building, and information networking, with a focus on technology enhancement, in alignment with the 2012 Arusha Declaration. The main objective of these efforts is to improve environmental conservation and stimulate societal and economic progress across Africa, ultimately benefiting its population.

In Taita Taveta, village committees have been established to oversee the establishment of seedling nurseries and the planting of trees. These committees also raise awareness about the importance of safeguarding and preserving small forest patches known as '*mitengo*', which serve as vital centres for biodiversity conservation and water catchment areas. Additionally, the committees are committed to upholding traditional values linked to stable ecosystems such as '*mitengo*'. They collaborate with various stakeholders including KFS, NEMA, chiefs, clan/village elders, county government, NGOs, and CBOs involved in conservation activities. The committees work diligently to ensure that small community forests are well-maintained (Wekesa et al., 2021).

In this case, social workers will create awareness among women to educate them on environmental issues. The awareness could include the need and importance of environmental perseverance, conservation, and management. And awareness of their right to participate in environmental decision-making, and their rights to land ownership. Women could also be educated on ways to conserve the environment and be mobilised to plant more trees or take on agroforestry practices. The Taita communities, in general, have small pieces of land, and as such women could be educated and trained on how to organize their farms and the crops that are conducive to their soils and climate. They could also be mobilised or educated on how to utilise community or local resources, skills, and funds to conserve their environment. This could also be undertaken as a community initiative where the community is mobilised and involved in environmental conservation projects or activities.

Social workers may empower women in Taita Taveta County to address environmental concerns and take the lead in creating and implementing sustainable solutions that benefit the entire community. This approach could contribute to improving the livelihoods of women in the County and combating issues including deforestation and land degradation. Social work Professionals may adhere to community organization principles, including but not limited to, empowering individuals, promoting

participation, ensuring women's inclusion, building capacity, advocating for change, and fostering collaboration.

Anup et al. (2018) in a study on the effects of ecotourism on various aspects such as livelihood improvement, economic development, environmental conservation, and social and cultural heritage preservation, revealed that socioeconomic variables had a positive effect on tourism participation with the exception of age and land ownership status having a negative effect, and that ecotourism helps in environmental conservation and socioeconomic development. Ecotourism has the potential to improve employment and entrepreneurial opportunities at the local level while also increasing the income and spending power of community members. To enhance the overall well-being of individuals, social workers could encourage the introduction of tourism awareness and educational programmes and facilitate the development of strategies that promote longer stay for visitors. This approach could help individuals improve their education and skills through participation in ecotourism activities, leading to increased human capital and higher incomes, ultimately resulting in an improved quality of life.

Ecotourism is a crucial aspect of development in Kenya, but it faces various constraints that hinder its growth. These include a weak policy, legal and regulatory framework, limited community participation, insufficient market penetration, and inadequate product development, along with limited financial incentives and growing environmental degradation (Kabeta, 2020). In Kenya, eco-sponsorship is implemented through the eco-warrior award, which acknowledges and commends exceptional contributions to ecotourism. The objective of this award is to encourage the winning ventures to adopt ecologically and ethically sustainable practices, enabling them to compete with the top contenders globally. (Atieno & Njoroge, 2018).

The natural resources of developing countries make ecotourism a potent catalyst for green growth, leading to the emergence of trade opportunities in distant regions. Moreover, ecotourism serves as an efficient channel for the transfer of wealth from affluent nations to underprivileged regions, as travellers frequently explore economically deprived and remote areas (Ireru et al., 2020). Ecotourism is a sustainable income-generating activity that not only benefits NGOs but also promotes environmentally friendly practices and preserves natural resources. It is an ideal concept for rural development as it creates employment opportunities for local communities, thereby contributing to their economic growth. This also makes it an attractive proposition for donors who seek to support sustainable wealth creation initiatives. The promotion of this strategy could be facilitated by social workers, in Taita County as it has the potential to improve the well-being of women and the wider community, thereby enhancing their livelihoods.

The adoption of ecotourism in Taita Taveta County aims to foster the engagement of a broad range of stakeholders, including women, men, women's groups, and self-help groups, in community-driven programs that address social development and environmental concerns. Furthermore, ecotourism promotes the sustainable exploitation of the region's biodiversity, enabling the support of sustainable livelihoods while simultaneously conserving the environment (Wekesa et al., 2021). Social workers can utilize this approach as a potent tool to encourage the involvement of women in environmental conservation efforts. For instance, social workers can organize or mobilise women who create handicrafts to exhibit and sell their products to both domestic and international tourists on designated market days. This initiative can generate additional income to expand and diversify their sources of livelihood.

The Taita Hills are renowned for their remarkable range of flora and fauna, stunning landscapes, the captivating culture of the Taita community, and advantageous placement within the coastal circuit. The

local community-based conservation group owns numerous campsites, and they have trained local tour guides to lead visitors through the forest, offering insights into the area's diverse flora and fauna, including endangered bird species like the *Taita Apalis* and *Taita thrush*, as well as the rich history of the Taita people. (Hohenthal, Minoia & Pellikka, 2017). In this case, green social worker practitioners could adopt community organisation as a method of intervention at a macro level to mobilise men and women, create awareness of the natural resources on Taita hills, train them on how to utilise these resources to generate income, create employment for the youth, use the income for socio-economic development. Beekeeping and butterfly farming are alternative sources of income, they can be used for pollination and medicinal and commercial purposes. Ecotourism improves the value of indigenous forests' conservation of biodiversity, contributes to the preservation of cultural heritage, it also creates employment opportunities, and enhances the well-being of the community (Serenari et al., 2017).

According to Ross Murray's (1956) definition of community organization social workers have the ability to empower the communities in Voi sub-County. The sub-County could achieve socioeconomic development and sustainable environmental conservation if social workers could enable the communities to identify their social and environmental problems, prioritise them, develop the confidence and motivation to address these issues and find both internal and external resources to tackle them. This approach can also promote cooperative and collaborative attitudes and practices in Voi sub-County, Taita Taveta County. For example, social workers who specialize in environmental issues could utilize community organization techniques on a large scale to mobilize both men and women. They could raise awareness about the natural resources available in Taita Hills and teach the community how to utilize these resources to generate income, provide employment opportunities for the youth, and use the revenue for socio-economic development. Alternative sources of livelihood, such as beekeeping and butterfly farming, could also be utilized for medicinal and commercial purposes.

Ecotourism has the potential to increase the significance of indigenous forests by preserving biodiversity, cultural heritage, creating employment opportunities, and improving the welfare of the local community. For instance, focusing on the handicrafts sold by women during market days, this activity can bring them together, and they can form self-help or women's groups. Through these groups, they can discuss various environmental conservation and livelihood improvement issues, prioritize their concerns, and address them. Furthermore, the women have the ability to obtain funds via their groups, which can aid them in addressing their challenges and enhance their means of living or livelihoods.

1.6 Methodology

Research Design: This study adopted mixed methods sequential explanatory design by integrating descriptive research which is a quantitative research design and phenomenological research design, a qualitative approach.

Study Area and Target Population: This study was conducted in Voi sub-county, Taita-Taveta County. This study targeted women in Voi sub-County, Taita Taveta County.

Sample and Sampling Techniques: Simple random sampling was adopted in this research to select women in the two wards namely; Mbololo and Ngolia respectively. Proportionate random sampling was adopted to sample the number of women in the villages selected.

Purposive sampling was used to select the twelve (12) villages where the study was conducted.

The sample for this study was determined using a statistical formula by Yamane (1967), as shown below:

$$n = N / [1 + N(e)^2]$$

Where N= Population Size (8631)

N=Total population of women in Ngolia ward (4,081) and Mbololo ward (4550)

N=8631

n=Sample Size

e= Margin of error (e = 0.05 at a confidence level of 95%).

1=Constant value

Therefore $n=8631/ [1+(0.05)^2]$

$n=399.9 \sim 400$

$n=400$

The sample size was allocated among 12 villages as follows: $400/12=33.3\sim 34$, that is 34 respondents/women in each village. There were 33 villages in Ngolia ward and 24 villages in Mbololo ward, however, the researcher proportionately chose 12 villages; 6 from Ngolia ward that were experiencing deforestation and 6 from Mbololo ward that were facing land degradation. The sample size $n= 400$ was equally distributed among the 12 villages in the two wards. Thirty-four (34) women were randomly selected for the administration of the questionnaire in the wards.

Research Instruments: Questionnaires, Key Informant Interview guides and Focus Group Discussion guides were the data collection instruments in the study. The researcher collected secondary data from library books, publications and articles, refereed journals, and past theses to complement primary data.

Data Collection Procedures: Data were collected in 2 phases. Phase 1, consisted of the collection of quantitative data, whereby structured questionnaires were administered to respondents. Phase two consisted of the collection of qualitative data where the participants were purposively selected. An interview guide with key informants and a discussion guide with Focus Groups was adopted.

Validity and Reliability: A Pilot study was conducted in Wundanyi, sub-County, Taita Taveta County. During pilot testing, the instruments were subjected to ten (10) participants who were randomly selected to check any difficulties with the test variables, iron out ambiguity and point out issues that are not culturally sensitive for restructuring before the actual data collection process begins. The researcher applied the Cronbach Alpha technique in this study to determine the internal consistency of the instruments that were used. The Alpha coefficient was above the 0.7 recommended minimum value (Creswell & Creswell, 2017). Thus, the instruments had an acceptable internal consistency.

Data Analysis Procedures: Quantitative data were analysed by the use of descriptive statistics using a computer package SPSS version 27. Findings were summarized in the form of frequencies and percentages. The data were presented in tables. Qualitative data obtained from Key Informants and Focus Group Discussions were cleaned, coded, transcribed, and categorized into themes for analysis.

1.7 Results and Discussion

The researcher obtained 369 complete questionnaires making a response rate of 92.3%. The researcher successfully interviewed 13 key informants and held four (4) successful Focus Group Discussions (FGDs). Two of the FGDs (8 members each) were from Mbololo ward and the other two (8 members each) were from Ngolia Ward.

The respondents were requested to indicate their levels of agreement on statements that relate to the strategies of community organisation, a method of social work that would enhance the participation of women in environmental conservation initiatives. The responses are presented in Table 1.

Table 1: Strategies of community organisation method of social work to enhance participation of women in environmental conservation initiatives

Statement	SD		D		N		A		SA		Total
	f	%	f	%	f	%	F	%	F	%	
Need to involve women in ecotourism strategies	0	0	0	0	11	3.0	172	46.6	186	50.4	369
Environmental education programmes	0	0	2	0.5	3	0.8	165	44.7	199	53.9	369
Women's rights and gender equality	0	0	5	1.4	9	2.4	255	61.0	130	35.2	369
The adoption of agroforestry	0	0	3	0.8	21	5.7	146	39.6	199	53.9	369
Financial incentives	0	0	2	0.5	2	0.5	177	48.0	188	50.9	369
Women empowerment	0	0	1	0.3	3	0.8	153	41.5	212	57.5	369
Conservative farming methods	0	0	1	0.3	5	1.4	146	39.6	217	58.8	369

Source: Field data, (2023)

Slightly above average of the respondents 217 (58.8%) strongly agreed that, conservative farming methods should be encouraged in the community and 146 (39.6%) agreed. This implies that there was a strong agreement that conservative farming methods should be encouraged in the community. Of the respondents, 212 (57.5%) strongly agreed that there is a need for women's empowerment so that women can play their role in economic, social, political, and environmental arenas. This shows that there is a need for women's empowerment so that women can play their role in the economic, social, political, and environmental arena. Slightly over half of the respondents 199 (53.9%) strongly agreed that environmental education programmes should be established in the community and 165 (44.7%) agreed. This is an indication that environmental education programmes should be established in the community.

From the study, 188 (50.9%) of the respondents strongly agreed that there is a need for financial incentives to promote environmental conservation, and 177 (48%) agreed implying that there is a need for financial incentives to promote environmental conservation. Of the respondents, 186 (50.4%) further strongly agreed that there is a need to involve women in ecotourism strategies, and 172 (46.6%) agreed with the statements. This is an indication that there is a need to involve women in ecotourism strategies. In corroboration with the findings, Ileri et al. (2020) also suggest that ecotourism is an income-generating activity, an environmentally friendly activity that will conserve our natural resources.

From the study, 199 (53.9%) of the respondents indicated that the adoption of agro-forestry would promote the sustainability of resources and environmental conservation, 146 (39.6%) agreed, and 21 (5.7%) were neutral. This is an indication that the adoption of agro-forestry would promote the sustainability of resources and environmental conservation. In tandem with the findings, Mulatu and Hunde (2019) revealed that agro-forestry provides numerous ecosystem services such as food, fodder and fuel wood, income sources, enhancing soil productivity, protecting against pests and increased resistance to diseases help the community to sustain changing climate effects.

Majority of the respondents 255 (61.0%) agreed that women's rights should be safeguarded and gender equality should be promoted, 130 (35.2%) strongly agreed, 9 (2.4%) were neutral and 5(1.4%)

disagreed. This indicates that women's rights should be safeguarded and gender equality be promoted. In Ethiopia, Alemayehu (2020) strongly argues that unless women are empowered and gender equality is achieved so that women can play their role in economic, social, political, and environmental arenas, the country will not achieve sustainable development.

The study also enquired on the strategies of community organisation methods of social work that will enhance the participation of women in environmental protection, conservation, and management initiatives through interviews and focus group discussions. From the interviews and the focus group discussions, the following themes emerged;

Awareness creation/Education: The respondents suggested that to enhance the participation of women in environmental protection, conservation, and management initiatives there is a need for awareness creation and education. The awareness should include the need and importance of environmental preservation, conservation and management. They should be trained on ways to conserve the environment and be mobilised to plant more trees. Jain and Jain (2017) found that villagers who were in social groups had sound environmental awareness and were able to protect, conserve, and manage their environment better than those who did not belong to a social group.

Involvement of women in training: They further suggested that NGOs and organizations that train on climate change should ensure that they include a large portion of women. Involving women in such training is advantageous in that unlike most men, women can be able to tell their stories and their own experiences which will pass on skills and experiences to other women. This way, the woman will be able to gain more skills and practice whatever they have been trained on. The women shall be organised in groups and trained on different environmental conservation aspects and programs that could also be a source of livelihood for their families. Organising and involving women will bring power to the community to solve the social problems brought on by deforestation and land degradation in the community at large.

Funding: It was also found that the participation of women in environmental conservation and management requires funding. Some women's groups have remained dormant due to financial constraints and as such funding would ensure that the groups are functional and the women are empowered. The county government should set aside a kit for women groups to ensure that the women are trained and have the capacity to implement the skills they have been trained on.

Agroforestry

The interviewees also suggested that there is a need for the community to adopt agroforestry. Agroforestry combines both modern and traditional land-use systems where trees are managed together with crops or animal production. Agroforestry can reduce the impact of climate change on agriculture. Sourcing tree products from trees grown on farms reduces the need to cut trees and hence reduces the rate of deforestation. In addition, agroforestry prevents soil erosion and has water conservation functions that prevent desertification. Similar views were echoed by Kumar and Saikia, (2020) that the agroforestry system is an essential source of forest products, and contribute significantly to the revenues of women-led households.

Ecotourism: The findings from the focus group discussions revealed that cultural sites in the localities provide some income for the government but not benefiting the people in the communities. To improve ecotourism and prevent land degradation in the community, it was suggested that the community needs special knowledge on how to identify those ecotourism sites and mark all their major trails in their

locale. If given proper guidance these individuals could form a group consisting of educated and older people who could teach their communities the traditional ways of life. Similarly, while assessing the role of ecotourism in environmental conservation and socioeconomic development in the Annapurna conservation area, Nepal, Anup et al. (2018) found that ecotourism helps in environmental conservation and socioeconomic development. It also helps in increasing employment and entrepreneurship at a local level. The income and expenditure of local people had increased because of ecotourism. It was revealed that there is a need to tap the potential of Taita Taveta as an ecotourism County; by addressing the wildlife conflict and the challenges faced by the communities. Government and donor communities should engage in ecotourism activities that will not only provide income for the community but also become an attraction point for tourists.

Role of the county government: They further suggested that the county should open up the climate-proofing infrastructure (such as; access roads, bridges, dykes, and gabions) which will make it possible for people to access ecotourism activities. The respondents further suggested that the county Government should revise its priorities. In addition, the county should come up with strategies to create employment to keep the residents busy because when they are idle they resort to ways that are harmful to the environment. Such strategies include support for the women groups such as those who make traditional and modern baskets. These groups lack a market for their products even though the area has the best material to weave baskets. The respondents further suggested that the county government should embrace the media in the county and community. The county should provide the community and the media with any data and information needed as opposed to just focusing on political matters.

Women Empowerment: The respondents suggested that there is a need for women to be financially empowered through economic activities or social activities in the communities. They also recommended that women should be given leadership positions and should be part of decision-making. In addition, they argued that there is a need to have capacity-building strategies targeted at women. There was also a suggestion that there is a need to change the male dominance tradition. The tradition has been that men feel like they have to be the main decision-makers. Women must be given their rights so that they can also be able to own land, use land and can be able to make decisions over land use.

Use of media: The respondents observed that stories should be out there, especially for those who are already doing something so that their stories can inspire other women. Their voices should be more uplifted and their experience shared through the media to inspire young girls and other women.

Involvement of women in decision-making/leadership: The respondents further suggested that the County government and the national government should bring women to the table and whichever laws they pass the women should be involved. Because women are the ones who face first-hand impact with issues of climate change and environmental degradation, they would be able to speak on the real issues and how it is affecting them. They should be accommodated in leadership positions, especially for various structures like Community Participatory Framework, Natural Resource Management such as the Youth Forest Association, and Water resources association. In corroboration with the study findings, Birindelli, Iannuzzi & Savioli (2019) notes that the aspect of mainstreaming women needs adequate consideration. For conservation efforts to be successful and sustainable, the fundamental roles of men and women in managing and conserving biodiversity must be taken into account.

Water harvesting for crop planting: The respondents also noted the need to have water harvesting where big tanks and gutters could be used to harvest water which can be used for consumption and irrigation. They suggested having water harvesting programmes like the use of farm ponds, concrete tanks, water pans, and reservoirs and encouragement of having various water storage among women in the communities.

Enhanced partner collaborations: The respondents suggested that the government and donor communities should work in collaboration to enhance water access projects as a key to climate change mitigation. They revealed the need to promote climate-smart agriculture and conservation agriculture among women and strengthen Community Forest Associations. The participants also suggested that there should be provision of incentives to motivate those who plant trees. Planting fruit trees should be encouraged as it will be beneficial since it will provide both fruits and wood. Further, they suggested that there should be annual tree planting days.

1.8 Conclusion

The study concludes that, social work professionals can play a critical role in addressing the problem of low women's livelihoods caused by deforestation and land degradation. Social workers can work at micro, meso, and macro levels to mobilize communities, address social issues, and advocate for policy changes. Environmental social workers can raise awareness, help families affected by human-wildlife conflict and water shortage, and encourage innovative ways of harvesting and preserving water. At the macro level, social workers can advocate for the inclusion of women in decision-making on environmental issues and advocate for legislative policies. The study highlights the importance of green social work practices that protect the welfare of people, animals, and the environment, and promote sustainable livelihoods.

The study argues for the inclusion of women in environmental initiatives and decision-making, as well as the need for environmental social work education within social work curricula to promote Sustainable Development Goals. The study also emphasizes the political mandate of social workers to protect the planet and its species. It recommends the inclusion of women in all environmental and development programs from inception to evaluation.

This study suggests that social work methods, such as casework, group work, community organization, social welfare administration, social action, and social research, could be applied at micro, meso, and macro levels to address the social issues resulting from deforestation and land degradation. Green social workers can empower women at the micro level, organize public lectures at the meso level, and facilitate the administration of welfare services at the macro level. Social research can also be useful to identify emerging social and environmental crises that affect communities. The study highlights the need for social workers to address environmental injustices and social issues at the individual, family, and community levels.

This study highlights the six methods of social work intervention, which operate at micro, meso, and macro levels. At the micro level, social workers can work with individual women or families to address social and economic problems related to the environment. At the meso level, social workers can use group work to mitigate the effects of climate change while promoting social cohesion and self-determination. At the macro level, practitioners can employ community organization as a method of social work to mobilize and advocate for socioeconomic and environmental justice. The study also

emphasizes the importance of women's participation in environmental protection, conservation, and management initiatives, and advocates for their inclusion in decision-making.

This study emphasizes the importance of women's participation in environmental protection and conservation initiatives but notes that they are often excluded from decision-making processes. Green social work aims to promote women's inclusion in leadership positions and environmental programmes at all stages. However, the COVID-19 pandemic has created new barriers and worsened existing ones for women's participation in environmental conservation in Voi Sub-County.

1.9 Recommendations

The study makes the following recommendations;

Green social work

There is therefore a need for practitioners to embrace the practice of green social work. Green social work is an emerging field, its perspective enables social workers to serve a supporting role in addressing climate change.

Awareness/education

There is a need to create awareness among women to educate them. The awareness could include the need and importance of environmental perseverance, conservation and management. This could also be undertaken as a community initiative where the community is mobilised and involved in environmental conservation projects since a community organization method of social work could solve the livelihood problems in the community through collective involvement.

Training

The study recommends that, NGOs and organizations that train on climate change should ensure that they include a large portion of women. Involving women in such training is advantageous in that unlike most men, women can be able to tell their stories and their own experiences which will pass on skills and experiences to other women.

Funding

Participation of women in environmental conservation and management requires funding. The county government should set aside a kit for women groups to ensure that the women are trained and can implement the skills they have been trained on.

Agroforestry

There is a need for the community to adopt agroforestry which combines both modern and traditional land-use systems where trees are managed together with crops or animal production. Agroforestry can reduce the impact of climate change on agriculture.

Ecotourism

Ecotourism should be adopted as a strategy to increase the forest cover and for the sustainability of the forests. Due to its potential to both preserve the forest and provide revenue for the local population, the use of forest land for ecotourism may be widely welcomed.

Law enforcement

The government should enact stronger laws that govern forest management. More often than not, the government turns a blind eye to the misuse of the practice via illegal logging and land grabbing for the sake of political expediency. There is a need for clear laws on forest management and clear responsibilities for the forest and environment management agencies so that those involved in forest management malpractices are held responsible.

Women empowerment

The study recommends that women be financially empowered through economic activities or social activities in the communities. Women should be given leadership positions and should be part of

decision-making, especially for various structures like Community Participatory Framework, Natural Resource Management such as the Youth Forest Association, and Water resources association.

Media

The media has a crucial role to play in airing environmental conservation information, initiatives and achievements made by others in environmental management to inspire others who may wish to undertake such activities.

Partner collaborations

There is a need for collaborative management of the environment. Collaborative management is an effective way to sustainably manage natural resources including forests. Community-based organizations, Government and donor communities should also work in collaboration to enhance water access projects as a key to climate change mitigation.

Introduction to alternative livelihood programmes

The county should come up with strategies to create employment and alternative sources of income for the residents. Such strategies include support for the women groups such as those who make traditional and modern baskets. Other alternative livelihood programmes would include beekeeping, kitchen gardening programmes, multilevel gardens, cone gardens, sack gardens, goat keeping, chicken rearing, beads and handwork to ensure women become empowered.

The Kenya Wildlife Service

There is also the need for the government to strengthen The Kenya Wildlife Service. There is a need for adequate human resource provision to ensure the KWS can adequately train women and the community at large on environmental conservation strategies such as tree planting.

Tree planting days

The study recommends that the county should have tree planting days scheduled every year where the communities are encouraged and supported in planting trees across the county.

Develop a gender-sensitive and inclusive approach

There is a need to create awareness about the importance of women's participation in environmental conservation initiatives and ensure that their needs and perspectives are taken into account when planning and implementing programs. This approach should also address any social and cultural barriers that may prevent women from participating.

Use technology to facilitate participation

COVID-19 led to increased reliance on technology and thus technology can be leveraged to facilitate women's participation in environmental conservation initiatives. This can include using social media platforms, webinars, and other online tools to connect with women and enable their participation.

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References

- Abera, T. A., Vuorinne, I., Munyao, M., Pellikka, P. K., & Heiskanen, J. (2022). Land cover map for multifunctional landscapes of Taita Taveta County, Kenya, based on Sentinel-1 radar, Sentinel-2 optical, and top climatic data. *Data*, 7(3), 36.
- Adams, E. A., Juran, L., & Ajibade, I. (2018). 'Spaces of Exclusion' in community water governance: A Feminist Political Ecology of Gender and Participation in Malawi's Urban Water User Associations. *Geoforum*, 95, 133-142.
- Alemayehu, B. A. (2020). Gender inclusive training challenges in higher education institutions in Ethiopia: Implications for reforming training for gender equality. *International Journal of Didactical Studies*, 1(1), 16-21.
- Al-Makhamreh, S., Alnabulsi, H., & Asfour, H. (2018). Social work field training for the community: A student self-directed approach in the environmental domain in Jordan. *The British Journal of Social Work*, 46(4), 855-872.
- Ayeni, J. S. O. (2018). Distribution of wildlife in relation to the water holes in Tsavo National Park (East), Kenya. In *Routledge Revivals: Wildlife Management in Savannah Woodland (1979)* (pp. 85-102). Routledge.
- Azeiteiro, U. M., Balogun, A. L., Setti, A. F. F., Mucova, S. A., Ayal, D., & Oguge, N. O. (2021). The influence of ecosystem services depletion on climate change adaptation efforts in Africa. *Science of The Total Environment*, 779, 146414.
- Bell, K., & Reed, M. (2022). The Tree of Participation: a new model for inclusive decision-making. *Community Development Journal*, 57(4), 595-614.
- Birindelli, G., Iannuzzi, A. P., & Savioli, M. (2019). The impact of women leaders on environmental performance: Evidence on gender diversity in banks. *Corporate Social Responsibility and Environmental Management*, 26(6), 1485-1499.
- Boetto, H. & Bowles, W. (2017). Ecosocial transitions: Exploring the wisdom of our Elders. In *The eco-social transition of societies: The contribution of social work and social policy* (pp. 190-205). London: Routledge.
- Borchorst, A., & Siim, B. (2018). Women and the advanced welfare state—a new kind of patriarchal power? In *Women and the State* (pp. 128-157). Routledge.
- Chan, S. H., & Lay, Y. F. (2018). Examining the reliability and validity of research instruments using partial least squares structural equation modelling (PLS-SEM). *Journal of Baltic Science Education*, 17(2), 239.
- Conceicao, R. A., Suman, D. O., & Gomes Soares, M. L. (2020). Weaknesses and Strengths in Marine Protected Areas in Rio de Janeiro, Brazil: A Glance to Community-management. *Journal of coastal research*, 95(SI), 738-742.
- Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.
- Cureg, M. C., Bagunu, A. M., Van Weerd, M., Balbas, M. G., Soler, D., & Van Der Ploeg, J. (2016). A longitudinal evaluation of the communication, education and public awareness (CEPA) campaign for the Philippine crocodile *Crocodylus mindorensis* in northern Luzon, Philippines. *International Zoo Yearbook*, 50(1), 68-83.

- Dai, L., & Wang, X. (2022). Research and Application of Optimal Allocation Model of Water and Soil Resources from the Perspective of Ecological Economics. *Journal of Sensors*, 2022.
- Dominelli L. (2021). A Green Social Work Perspective on Social Work during the Time of COVID-19. *International Journal of Social Welfare*, (30), 7-16. DOI: 10.1111/ijsw.12469.
- Dominelli, L. (2018). Green social work in theory and practice: A new environmental paradigm for the profession. In *The Routledge Handbook of green social work* (pp. 9-20). Routledge.
- Driver, T. F. (2019). *Liberating rites: Understanding the transformative power of ritual*. Routledge.
- Foster, E. (2021). Ecofeminism revisited: critical insights on contemporary environmental governance. *Feminist Theory*, 22(2), 190-205.
- Gadgil, M. (2021). Sunderlal Bahuguna (1927–2021) The Rishi from the Himalayas who Fought for Nature and People.
- Gericke, N., Manni, A., & Stagell, U. (2020). The green school movement in Sweden–Past, present and Future. In *Green Schools Globally* (pp. 309-332). Springer, Cham.
- Gill, P., & Baillie, J. (2018). Interviews and focus groups in qualitative research: an update for the digital age. *British dental journal*, 225(7), 668-672.
- Gomes, V. H., Vieira, I. C., Salomão, R. P., & ter Steege, H. (2019). Amazonian tree species are threatened by deforestation and climate change. *Nature Climate Change*, 9(7), 547-553.
- Goyke, N., Dwivedi, P., Hitchner, S., Schelhas, J., & Thomas, M. (2019). Exploring diversity in forest management outlooks of African American family forest landowners for ensuring the sustainability of forestry resources in the Southern United States. *Human Ecology*, 47(2), 263-274.
- Hedelin, B., Evers, M., Alkan-Olsson, J., & Jonsson, A. (2017). Participatory modelling for sustainable development: Key Issues Derived from Five Cases of Natural Resource and Disaster Risk Management. *Environmental Science & Policy*, 76, 185-196.
- Hegde, P., & James, G. (2018). Challenging biocultural homogenization: experiences of the Chipko and Appiko movements in India. In *From Biocultural Homogenization to Biocultural Conservation* (pp. 427-442). Springer, Cham.
- Helbert, M. (2021). Towards a Critical Ecofeminist Theory. In *Women, Gender and Oil Exploitation* (pp. 11-45). Palgrave Pivot, Cham.
- Hussain, K., Rahman, F., Ullah, I., Ahmad, Z., & Schickhoff, U. (2022). Assessing the Impacts of Population Growth and Roads on Forest Cover: A Temporal Approach to Reconstruct the Deforestation Process in District Kurram, Pakistan, since 1972. *Land*, 11(6), 810.
- Icheria, B. K. (2019). *An investigation into food security among female-headed households in Kenya: A case of VOI division in Taita-Taveta County* (Doctoral dissertation, University of Pretoria).
- ICPAC, (2021). Women in Weather and Climate Reporting. <https://icpac.medium.com/women-in-weather-and-climate-reporting-5954958a872f>
- Ireru, P., Kung'u, J. B., & Muriithi, J. K. (2020). Distribution of the Benefits of Ngare Ndare Forest Trust and Il Ngwesi Group Ranch Ecotourism Enterprises in Kenya. *African Journal of Hospitality, Tourism and Leisure*, 9(5), 1178-1192.
- Islam, J. (2018). Women participation in environmental protection in India: a review. *Journal of Education and Development*, 38(3).
- Jain, P., & Jain, S. (2017). Role of social groups to enhance awareness about environment conservation. *International Journal of Research -GRANTHAALAYAH*, 5(11), 50–52.
- James, R. O. B. Y. N., Gibbs, B., Whitford, L., Leisher, C., Konia, R., & Butt, N. (2021). Conservation and natural resource management: where are all the women? *Oryx*, 55(6), 860-867.
- Kabeta, L. (2020). Ecotourism as Alternative Mean of Biodiversity Conservation and Livelihood Improvement of the Local Community. workshop 2015, 145.

- Keith, D. A., Ferrer-Paris, J. R., Nicholson, E., & Kingsford, R. T. (2020). *IUCN Global Ecosystem Typology 2.0*. Gland: IUCN.
- Kenya Population and Housing Census Volume 1(2019): *Population by County and Sub-County*. Kenya National Bureau of Statistics. Retrieved 4 November 2019.
- Kings, A. E. (2017). Intersectionality and the changing face of ecofeminism. *Ethics and the Environment*, 22(1), 63-87.
- Kleiber, D., Harris, L., & Vincent, A. C. (2018). Gender and Marine Protected Areas: A Case Study of Danajon Bank, Philippines. *Maritime Studies*, 17(2), 163-175.
- Kogo, B. K., Kumar, L., & Koech, R. (2019). Forest cover dynamics and underlying driving forces affecting ecosystem services in western Kenya. *Remote Sensing Applications: Society and Environment*, 14, 75-83.
- Kumar, R., & Saikia, P. (2020). Forest resources of Jharkhand, Eastern India: socio-economic and bio-ecological perspectives. In *Socio-economic and Eco-biological Dimensions in Resource Use and Conservation* (pp. 61-101). Springer, Cham.
- Landauer, M., & Komendantova, N. (2018). Participatory environmental governance of infrastructure projects affecting reindeer husbandry in the Arctic. *Journal of Environmental Management*, 223, 385-395.
- León-Fernández, Y., Gomera, A., Antúnez, M., Martínez-Esrich, B., Villamandos, F., & Vaquero, M. (2018). Enhancing environmental management in universities through participation: the case of the University of Córdoba. *Journal of cleaner production*, 172, 4328-4337.
- Mago, P., & Gunwal, I. (2019). Role of women in environment conservation. Available at SSRN 3368066.
- Manimekalai, K., & Sindhuja, P. (2019). Mainstreaming Gender in Environment: A Path for Sustainable Development. *NEW INDIA*, 25.
- Marin, A. B., & Kuriakose, A. T. (2017). *Gender and sustainable forest management: entry points for design and implementation*. Washington, DC: Climate Investment Funds.
- Mildenberger, M. (2019). The Tragedy of the Tragedy of the Commons. *Scientific American*, 23.
- Mpambela, M. & Mabvurira V. (2017). Effects of climate change and their indelible impact on social work profession in Zimbabwe. *African Journal of Social Work*, 7(2), 30-35.
- Mulatu, K., & Hunde, D. (2019). Agroforestry: A Supplementary Tool for Biodiversity Conservation and Climate Change Mitigation and Adaptation. *system*, 9(19).
- Mwagandi, S., & Mwachanya, T. (2020). Likely Employee Response to Mining 4.0: Lessons from Mechanization of Iron Ore Mining in Taita Taveta County, Kenya. *African Journal of Mining, Entrepreneurship and Natural Resource Management*, 2(1), 138-142.
- Mwakesi, M. I., Wahome, R., & Ichang'i, D. (2020). Mining impact on communities' livelihoods: A case study of Taita Taveta County, Kenya. *AIMS Environmental Science*, 7(3), 286-302.
- Mwikamba, J. N., Otieno, D. J., & Kosura, W. O. (2022). Adoption of climate-smart horticulture practices and use of mobile phones in Taita-Taveta County, Kenya. *East African Agricultural and Forestry Journal*, 85(1 & 2), 13-13.
- Nirmala, T., & Arul, A. (2017). Framing of the environment in English and Tamil newspapers in India. *Journal of Media and Communication Studies*, 9(1), 1-9.
- Ochieng, O. (2017). A social movement for the Anthropocene: Wangari Maathai's African Feminist Environmentalist. *African Journal of Rhetoric*, 9(1), 15-29.
- Odrawaz-Coates, A. (2021). Definitions of Sustainability in the Context of Gender. *Sustainability*, 13(12), 6862.

- Olsson, M., & Martiny, S. E. (2018). Does exposure to counterstereotypical role models influence girls' and women's gender stereotypes and career choices? A review of social psychological research. *Frontiers in Psychology*, 9, 2264.
- Ondiba, H. A., & Matsui, K. (2021). Drivers of environmental conservation activities among rural women around the Kakamega forest, Kenya. *Environment, Development and Sustainability*, 23(7), 10666-10678.
- Otieno, M., Joshi, N., & Rutschmann, B. (2021). Flower visitors of *Streptocarpus teitensis*: implications for conservation of a critically endangered African violet species in Kenya. *PeerJ*, 9, e10473.
- Parpart, J. L. (2019). Women and the State in Africa. In *The Precarious Balance* (pp. 208-230). Routledge.
- Pease, B. (2019). Recreating men's relationship with nature: Toward a profeminist environmentalism. *Men and masculinities*, 22(1), 113-123.
- Pretty, J., N. (1994). Alternative systems of inquiry for sustainable agriculture. *IDS Bulletin*, 25(2), 37-49.
- Raimi, M. O., Suleiman, R. M., Odipe, O. E., Tolulope, S. J., Modupe, O., Olalekan, A. S., & Christianah, M. B. (2019). Women's role in environmental conservation and development in Nigeria. *Ecol Conserv Sci*, 1(2).
- Rambaree, K. (2020). Environmental social work; Implications for accelerating the implementation of sustainable development in social work curricula.
- Rambaree, K., Powers, M. and Smith, R. (2019), "Ecosocial work and social change in community practice", *Journal of Community Practice*, Vol. 27 Nos 3/4, pp. 205-212 doi: 10.1080/10705422.2019.1660516.
- Rume, T., & Islam, S.D.U. (2020). Environmental effects of COVID-19 pandemic and potential strategies of sustainability. *Heliyon*, 6(9), e04965.
- Segerson, K., Kling, C. L., & Bockstael, N. E. (2022). Contributions of women at the intersection of agricultural economics and environmental and natural resource economics. *Applied Economic Perspectives and Policy*, 44(1), 38-53.
- Shanley, P., da Silva, F. C., MacDonald, T., & da Serra Silva, M. (2018). Women in the wake: expanding the legacy of Chico Mendes in Brazil's environmental movement. *Desenvolvimento e Meio Ambiente*, 48.
- Shrestha, U. (2017). Community participation in wetland conservation in Nepal. *Journal of Agriculture and Environment*, 12, 140-147.
- Singh, R. L., & Singh, P. K. (2017). Global environmental problems. In *Principles and applications of environmental biotechnology for a sustainable future* (pp. 13-41). Springer, Singapore.
- Steiner, A. (2019). Climate change, environment, and sustainable development in Africa. In *African Economic Development*. Emerald Publishing Limited.
- Subramanian, K. R. (2018). The crisis of consumption of natural resources. *International Journal of Recent Innovations in Academic Research*, 2(4), 8-19.
- Sultana, R. (2021). Ecofeminists Combating Patriarchal Ideology: A Study of Postcolonial Indian Fiction.
- Waiganjo, R. W. (2019). *Gender Relations and Women's Economic Empowerment in Artisanal Gemstone Mining in Taita Taveta County, Kenya* (Doctoral dissertation, University of Nairobi).
- Wangchuk, J., Choden, K., Sears, R. R., Baral, H., Yoezer, D., Tamang, K. T. D., & Dhendup, T. (2021). Community perception of ecosystem services from commercially managed forests in Bhutan. *Ecosystem services*, 50, 101335.

- Wekesa Chumuku, Leila Akinyi Ndalilo, Caroliye Manya, (2021). Reconciling Community Livelihood Needs and Biodiversity Conservation in Taita Hills Forests for Improved Livelihoods and Transformational Management of the Landscape; In book: *Fostering Transformative Change for Sustainability in the Context of Socio-Ecological Production Landscapes and Seascapes (SEPLS)* (pp.17-35), DOI:10.1007/978-981-33-6761-6_2. Researchgate.
- Wilson, J. (2017). "Book Review: All Our Relations: Native Struggles for Land and Life by Winona LaDuke," *International Social Science Review*: Vol. 93: Issue 2. Article 16.
- Yanquoi, H., Hiama, P. D., & Jones, M. (2018). Improving productivity through effective soil, water and nutrient management in Liberia. *International Journal for Agriculture Research and Publication*.