



Women as leaders in green economy: A pathway to empowerment and sustainability

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Abstract

The green economy presents a critical opportunity to address environmental challenges while fostering sustainable economic growth. However, gender disparities persist in this evolving sector, with women often underrepresented in leadership roles, technical positions, and decision-making processes. As the world shifts toward sustainable development and green economic practices, the inclusion of women in this evolving sector is both a necessity and an opportunity. However, significant gender disparities persist in access to green jobs, leadership roles, and technical education related to the green economy. This paper explores the critical role that training and education play in bridging these gaps. It highlights existing barriers such as limited access to STEM education, gender biases in vocational training, and socio-economic constraints, while showcasing successful initiatives that empower women through targeted green skills development. Drawing on global case studies and policy analyses, the study advocates for inclusive education models, community-driven training programs, and gender-responsive policies that can create equitable pathways for women in the green economy. By equipping women with relevant skills and knowledge, we can foster a more inclusive, innovative, and sustainable future.

Keywords: Green economy, women, education

Introduction

The transition to a green economy presents significant opportunities for sustainable development, environmental conservation, and economic innovation. However, the benefits of this transition are not equally distributed, particularly in terms of gender equity. Women remain underrepresented in many sectors of the green economy, including renewable energy, sustainable agriculture, environmental science, and green technology. This underrepresentation stems from a range of structural barriers, including limited access to education, training, and resources necessary for participation and advancement in green sectors.

Bridging this gender gap is essential not only for promoting social justice but also for enhancing the effectiveness and inclusivity of environmental and economic policies. Education and training are critical instruments in this effort, serving as catalysts for empowerment, skill development, and increased participation of women in the green economy. By creating equitable access to these opportunities, societies can harness the full potential of their human capital and foster more inclusive, resilient, and sustainable growth.

This paper examines the role of training and education in addressing gender disparities within the green economy. It explores the challenges women face in accessing green education and employment, highlights successful initiatives and best practices, and proposes strategic recommendations for creating a more gender-inclusive green transition.

Women and the Green Economy: Opportunities and the Challenges

According to the (ILO) the evolution to a green economy is expected to generate 24 million new jobs globally by 2030. However, despite this rapid expansion, women remain underrepresented in key areas of the energy and sustainability sectors. The International Renewable Energy Agency reports that women comprise only 32% of the

renewable energy workforce, with even fewer holding technical and leadership positions. Williams *et al.*, (2018)^[21] identified, through an experiment, that collaboration between universities and other external private entities would provide the opportunity to train students in ECE more efficiently not only as a vehicle for learning, but also towards professional development. The transition to a green economy offers significant opportunities for women, especially in sectors such as renewable energy, sustainable agriculture, waste management, and environmental conservation.

According to the International Labour Organization (ILO), green jobs are essential for achieving sustainable development goals, and women are uniquely positioned to benefit from these emerging roles (ILO, 2020)^[9]. Women, particularly in developing countries, are increasingly participating in industries such as solar energy, eco-friendly agriculture, and climate resilience projects, where their involvement can lead to broader economic empowerment and the creation of more inclusive communities (UN Women, 2021)^[17]. However, the green economy's potential is not being fully realized due to persistent gender disparities. Women face challenges such as limited access to technical training, financial resources, and leadership opportunities in the green sectors. The Global Green Growth Institute (GGGI, 2022)^[5] reports that women remain underrepresented in the decision-making spaces that shape green policies and technologies, limiting their ability to influence sustainable development strategies. Furthermore, women often bear the brunt of climate change impacts, yet they are frequently excluded from policy-making processes related to climate action (UNFCCC, 2021)^[20]. To bridge these gaps, it is crucial to invest in gender-sensitive policies that promote equal access to education, training, and resources in the green economy. In particular, initiatives that enhance women's skills in green technologies and entrepreneurship can help address both the gender and

environmental challenges we face today (World Bank, 2020) ^[22]. Empowering women in green sectors is not just about gender equality but is also critical for accelerating global progress toward sustainability and climate resilience.

The Role of Training and Education in Addressing Gender Disparities within the Green Economy

Training and education are fundamental in bridging the gender gap within the green economy by equipping women with the skills and knowledge necessary to participate in and lead sustainable industries. Despite the growing demand for green jobs, women, particularly in developing countries, face significant barriers to entering green sectors due to limited access to relevant education, technical training, and resources (World Bank, 2020) ^[22].

According to the International Labour Organization (ILO), women are underrepresented in green jobs, especially in fields such as renewable energy, waste management, and environmental engineering, primarily due to gender-based disparities in education and training opportunities (ILO, 2021) ^[10]. Therefore, targeted investments in education and vocational training programs are essential to empower women to access and thrive in these sectors. Gender-responsive training programs that address the specific needs of women can help overcome barriers such as lack of technical expertise, financial constraints, and societal norms that discourage women's participation in certain industries (UN Women, 2020) ^[15]. Educational initiatives can also help shift societal attitudes that traditionally view certain green sectors, like clean technology or engineering, as male-dominated. By incorporating gender-sensitive curricula into educational institutions and vocational training centers, we ensure that both women and men have equal access to opportunities in the green economy (UNDP, 2021) ^[18].

In addition to technical training, mentorship programs, leadership development, and entrepreneurship courses can provide women with the necessary tools to take on leadership roles within the green economy. A report by the Global Green Growth Institute (GGGI) highlights the importance of providing women with capacity-building opportunities that help them build confidence, expand their networks, and create sustainable businesses in green industries (GGGI, 2022) ^[5]. By creating an environment that fosters women's education and skill development in the green economy, we can promote gender equality and drive more inclusive and sustainable growth. Ultimately, investing in the education and training of women is not only essential for addressing gender disparities but also for creating a more resilient, innovative, and environmentally sustainable economy (World Economic Forum, 2020) ^[25].

Initiatives and Best Practices, and Strategic Recommendations for Creating a More Gender-Inclusive Green Transition

Several successful initiatives and best practices have already demonstrated the transformative potential of gender-inclusive approaches to the green economy. One of the most notable examples is the Barefoot College initiative in India, which trains women, particularly grandmothers from rural communities, to become solar engineers. This program has successfully equipped women with technical skills in solar power installation, making them agents of change in their communities and advancing the global renewable energy

transition (Barefoot College, 2021) ^[4]. Another example is the Solar Sister program, which empowers women in sub-Saharan Africa by training them to sell and distribute solar energy products in their communities. Through this initiative, women not only gain technical skills but also improve their economic independence and contribute to the spread of clean energy (Solar Sister, 2020) ^[13]. These programs highlight how targeted education and capacity-building initiatives can enable women to become leaders in green technologies while addressing issues of energy access and sustainability.

Furthermore, the Green Jobs for Women initiative by the International Labour Organization (ILO) is another successful program aimed at creating sustainable, gender-equitable employment opportunities in the green economy. By providing training in renewable energy, waste management, and sustainable agriculture, the ILO has helped thousands of women access jobs in green sectors, promoting both environmental and gender equality goals (ILO, 2021) ^[10].

Despite these promising efforts, more needs to be done to ensure that the green transition benefits women equally across the globe. Strategic recommendations for achieving a more gender-inclusive green economy include:

- 1. Policy Reform and Gender-Sensitive Legislation:** Governments should enact policies that promote gender equality in the green economy, such as quotas for women in leadership roles within green sectors and funding for gender-focused training programs (UN Women, 2020) ^[15].
- 2. Scaling Up Education and Vocational Training:** It is essential to invest in education systems that integrate green economy principles, environmental sustainability, and gender equality from an early age. Vocational training programs must be made accessible to women and tailored to local needs to ensure their successful entry into green sectors (UNDP, 2021) ^[18].
- 3. Public-Private Partnerships for Green Job Creation:** Collaborations between governments, businesses, and civil society organizations can promote the creation of green jobs and ensure that women have access to these opportunities. For example, the involvement of private companies in supporting training programs and providing mentorship opportunities for women can facilitate smoother transitions into the workforce (World Bank, 2020) ^[22].
- 4. Promoting Leadership and Entrepreneurship:** Women's leadership in the green economy should be encouraged by providing platforms and mentorship for women to take on leadership roles in green sectors, as well as access to finance and business development resources. Entrepreneurial training focused on green technologies can foster innovation and economic empowerment among women (Global Green Growth Institute, 2022) ^[5].

These recommendations, when implemented effectively, can ensure that the green economy transition is both environmentally and socially sustainable, with equal participation of women at every stage.

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