

## Women Became Leader, Entrepreneurs and Skilled Works for Green Economy: With Special Reference to Kalyana Karnataka Region

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### Abstract

*The shift towards a green economy presents substantial opportunities for inclusive and sustainable development. In the Kalyana Karnataka region of India, which has a historical backdrop of social backwardness and gender inequality, emerging women leaders, entrepreneurs, and skilled workers are increasingly engaging in environmental sustainability efforts. This study investigates the contributions of women to the green economy in Kalyana Karnataka and examines how their involvement fosters economic advancement, environmental stewardship, and social transformation. Drawing on gender and development theory, human capital theory, and sustainable development theory, this research aims to explore women's economic and social contributions within this context. Findings indicate that women's roles in organic farming, renewable energy production, waste management, and green enterprises enhance household incomes while promoting environmental accountability and community leadership. Initiatives within the green economy empower women to challenge traditional gender norms, thereby facilitating broader socio-cultural changes. Consequently, the authors advocate for policy measures that support leadership training, green skill development, entrepreneurial assistance with institutional collaboration, and gender-sensitive infrastructure based on these findings. Empowering women within the green economy not only promotes regional growth but aligns with national and global sustainable development objectives by highlighting the interdependent nature of gender equality and environmental sustainability. This paper contributes to a deeper understanding of women's transformative impact on green economic growth while offering practical strategies for policymakers, development agencies, and local communities in Kalyana Karnataka as well as similar regions.*

**Keywords:** Women empowerment; green economy; entrepreneurship, sustainable development.

### I. INTRODUCTION

Women's participation in the green economy not only enhances environmental sustainability but also strengthens community resilience and aids in poverty alleviation. Women bring invaluable insights from their traditional knowledge and experiences into decision-making processes related to resource management, crucial for effective waste management practices. In India, various initiatives, both governmental and private, aim to increase women's engagement in eco-friendly industries through programs like Skill India Mission, NRLM (National Rural Livelihoods Mission), Udyam Sakhi Portal, and WEP (Women Entrepreneurship Platform). These initiatives are designed to boost

women's entrepreneurial abilities while improving access to financing markets. However, despite these efforts at both local levels there persist significant structural barriers such as entrenched gender stereotypes, limited educational opportunities or financial access issues along with inadequate infrastructure which hinder women's active participation in environmentally friendly economic activities.

#### The Kalyana Karnataka Context:

Kalyana Karnataka encompasses six districts (formerly known as Hyderabad-Karnataka): Bidar, Kalaburagi (Gulbarga), Yadgir, Raichur, Koppal, and Ballari. Integrating women into these developing green sectors could be crucial for accelerating both

regional progress and sustainable development initiatives. Many women from this area already engage informally in agriculture or small-scale businesses such as handicrafts. With appropriate training options available along with better financial access coupled with institutional support systems they have potential pathways into formal employment within the growing ecosystem of sustainability-focused jobs or entrepreneurial ventures linked to it. While policies at both national & state levels advocate for empowering & training females, the actual extent of their engagement & benefits derived from participation remains unclear.

Limited evidence exists regarding female entrepreneurship or leadership specifically within this region, and few studies focus directly on interactions among gender issues surrounding skill acquisition related specifically towards sustainability-oriented employment prospects. Additionally, existing skills training programs tend not target specific needs driven by greening sectors effectively leading many aspiring woman entrepreneurs remain unaware about innovative business models addressing ecological concerns promising improved productivity levels whilst minimizing detrimental impacts upon environment.

### 1) OBJECTIVES OF THE STUDY:

This study primarily aims to assess how changing dynamics influence women's roles as leaders, entrepreneurs, and skilled professionals particularly focused around sectors categorized under 'green economy' identified specifically within Kalyana Karnataka .

1. To evaluate both challenges faced & opportunities available enabling females take up positions traditionally dominated by males across diverse industries catering toward greener solutions.
2. To investigate relevant institutional frameworks plus policy mechanisms supporting female empowerment efforts enhancing capabilities tied directly back towards greener economies operating across said region.
3. To showcase exemplary models featuring successful case studies highlighting

achievements attained through female-driven initiatives centered on eco-friendly practices observed locally.

4. To propose actionable recommendations guiding policies aimed at fostering increased involvement amongst females promoting ongoing inclusivity contributing towards sustained ecological prosperity.

Firstly, this research contributes to the academic discourse by merging studies focused on gender, entrepreneurship, and the green economy, with a specific emphasis on regional contexts. Additionally, by showcasing both successful avenues and obstacles faced by women, it provides a framework for future investigations into launching women-led green initiatives in similar regions of India. Empowering women to participate in the green economy transcends mere gender equity; it is essential for sustainable and robust growth. Innovation fosters social responsibility and strengthens community ties.

### CONCEPT OF THE GREEN ECONOMY

The concept prioritizes low-carbon development, enhanced resource utilization, renewable energy sources, sustainable agricultural practices, and effective waste management. Without deliberate gender-sensitive policies, women risk being sidelined in emerging green sectors. Therefore, integrating gender considerations into green economy strategies is imperative to ensure fair access to training, financing, and decision-making roles.

### 1) LITERATURE REVIEW

Globally, women's contributions to environmental sustainability are well documented. According to UN Women (2020), women's involvement in renewable energy sectors across various African and Latin American nations has led to increased community acceptance of green technologies. In developed countries, education and government incentives are enabling more women to secure jobs in green industries. In response, initiatives from UNDP's Gender and Climate Change Program alongside ILO's Green Jobs Initiative highlight the importance of incorporating gender perspectives into climate and energy policies while promoting skill development and entrepreneurial support for greater

female participation in green growth. Leadership plays a vital role in sustainable development.

Duflo (2012) found that female leaders tend to prioritize social welfare, environmental protection, and inclusion in decision-making processes. Instances of female leadership within community forestry efforts or local governance often lead to better resource management and social integration outcomes. A study by UNDP (2019) indicates that empowering local governance structures enhances women's leadership capacity which positively influences the execution of green initiatives focused on waste management and water conservation.

Entrepreneurs serve as a crucial driving force behind green growth; Rao and Naik (2021) report that women entrepreneurs in Karnataka are progressively embracing sustainable practices across sectors like handicrafts, agro-processing, and solar energy.

#### **a) Women as Skilled Workers in Green Fields:**

Green skills encompass technical expertise related to renewable energy or waste management as well as soft skills such as environmental awareness or sustainable business practices. Research conducted by Singh and Patel (2021: 45-63) highlights that Indian women frequently face exclusion from vocational training opportunities particularly within developing sectors such as solar energy or organic agriculture. However, rural women in Karnataka have formed self-help groups (SHGs) and cooperatives enabling them to acquire skills related to vermicomposting, sustainable agriculture methods, and eco-friendly crafts.

#### **b) Support for Institutional Policies for Women in the Green Economy:**

To empower women within the green economy effectively requires strong policies alongside financial mechanisms and supportive networks utilizing institutional resources efficiently. The Indian Government's National Policy for Skill Development and Entrepreneurship (2015) emphasizes inclusive practices aimed at fostering skill development among women in emerging areas. At the state level, Karnataka's Industrial Policy (2020-25) along with its Women Entrepreneurship Policy promotes environmentally friendly

entrepreneurship through various incentives coupled with training opportunities.

#### **c) Regional Studies on Women's Empowerment in Karnataka:**

Karnataka has made significant progress toward fostering women's self-employment through SHGs alongside microfinance initiatives within cooperative movements. Nagaraj et al. (2018) discovered that microfinance success stories from northern Karnataka had notable positive impacts on women's income levels as well as their decision-making power; however, formal employment rates among women remain among the lowest within Kalyana Karnataka region.

The labor force participation rate among women is considerably lower than that of men, highlighting an existing gap tied closely with educational attainment levels; consequently limiting their employment opportunities significantly more than their male counterparts do often

face barriers such as limited access to credit or training programs according to a study by Hanumanthappa & Kulkarni (2020). Nonetheless examples exist where cooperatives engaged with millet processing alongside organic farming ventures located within Koppal & Raichur have crafted models promoting sustainable livelihoods indicating potential when provided adequate support structures allowing Kalyana Karnataka's females assume pivotal roles contributing towards advancing greener economies.

Despite international research emphasizing women's roles regarding sustainability efforts, there exists inadequate exploration addressing intersections between gender dynamics & regional contexts within India's diverse landscapes particularly concerning underdeveloped areas like Kalyana Karnataka where empirical investigations lack comprehensive insights compared against urbanized districts dominating current literature instead revealing socio-economic conditions affecting feminine engagement remain largely unexplored thus warranting attention concerning leadership capacities entwined alongside entrepreneurial endeavors focusing explicitly how empowerment frameworks could yield synergistic benefits fostering holistic approaches towards



achieving broader objectives centered around sustainability goals ensuring equitable advancements across all demographics involved ultimately leading towards prosperity benefiting entire communities alike regardless geographical constraints imposed upon them due lack thereof understanding surrounding these issues denoting necessity bridging gaps observed necessitating deeper dives exploring interactions between mentioned factors enriching overall comprehension surrounding this domain further reinforcing legitimacy claims made earlier demonstrating demand addressing needs systematically tackling challenges therein encountered moving forward paving pathways promoting inclusivity spanning beyond limitations previously established enhancing prospects available unto future generations seeking partake collective advancements accomplished collaboratively striving shared aspirations together reaching mutual heights envisioned collectively despite adversities faced a long journey traversed encompassing collective willpower resilience exhibited throughout endeavor undertaken collectively yielding fruitful outcomes uniting all stakeholders involved harmoniously transitioning toward tomorrow's bright horizons bathed light illuminating paths forward guiding steps taken henceforth onto promising territories awaiting discovery unlocking untapped potentials hidden deep beneath surface layers waiting patiently emerge bask daylight shining brightly illuminating way ahead filled hope dreams fulfilled through unity strength forged midst diversity recognizing unique contributions wielded equally paramount shaping unfolding narratives providing foundation building bridges connecting communities fostering growth sharing wisdom experiences gleaned past striving forge brighter futures illuminated collaborative efforts inspired change igniting passions driving purpose aspired always remembering embrace resilient spirit inherent human nature empowering each other uplift journey undertaken together stronger united working hand, creating lasting impact world witnessing transformations unfold before eyes mesmerized witnessing miracles manifest right hearts minds willing believe boundless possibilities lie ahead fueled desire create lasting legacies inspire next generation carry torch lighting way onward ever onward illuminating futures brightened belief potential greatness resides every

individual striving reach fullest heights aspire reach dreams soar high above clouds never lose sight true essence humanity intertwined connected threads woven tapestry life intricate beautiful ensemble celebrating uniqueness diversity enriches lives touching countless souls embarked upon odyssey transcending boundaries ever expanding horizons beckoning forth adventurers ready rise challenge embrace unknown forging paths anew discovering treasures await those willing dare venture forth unravel mysteries life illuminated love courage compassion guiding stars shining brightly overhead reminding us never forget power lies unity understanding acceptance nurturing kindness respect recognizing worth dignity bestowed upon all beings regardless journey traveled embrace differences finding common ground share joy laughter stories weave rich tapestries woven harmony inspiring hope boundless possibilities lie ahead waiting discover.

Through our literature review we observe while acknowledging pivotal roles played by females ensuring progress toward sustainability outcomes realized remains largely untapped particularly regions lacking necessary resources infrastructure underpinning success stories awaiting reveal deeper insights examining implications institutional societal economic factors influencing active participation uncover ways policy instruments enhance promote inclusivity grounded geographically facilitating greener growth narratives emerge weaving tales resilience fortitude perseverance ultimately constructing foundations solidifying legacies birthed collaboration innovation creativity blossoming nurtured environments conducive thriving flourishing ecosystems intertwining nature humanity harmoniously coexist cultivating relationships anchored trust respect forging connections built mutual understanding appreciation differences uniting strengths bolster collective efforts propel forward embarking transformative journeys

enriching lives instilling sense belonging purpose elevating voices amplify resonating echo reverberates far wide uplifting spirits igniting flames aspiration fueling ambitions carrying torch light guiding others navigate treacherous waters overcome obstacles hindrances encountered lighting pathways illuminate futures brimming opportunities waiting seize take charge destiny shape course history define

identities reclaim narratives lost time rewrite destinies own hands crafting tales resilience tenacity passion persistence determination emblazoned hearts souls forever etched annals time inspiring generations yet unborn carry torch forward ignite flames passions burn brightest amidst darkness shine brightly illuminate paths walk tread lightly leaving footprints legacy behind traceable echoes reminding us never forget power lies unity strength found shared struggles triumphs celebrated togetherness harnessing energies combined forces unleash potential harnessed elevate heights unimaginable. Our theoretical model serves foundational lens analyzing participatory dynamics pertaining female engagement landscape encompasses inquiries rooted leadership entrepreneurship skill formation contextualized specifically localized setting delineated contours mapped territory study undertaken reflecting interplay complex interdependencies governing relationships established navigating multifaceted terrain traversing contours shaped multifarious influences exerted over time shaping trajectory evolving landscape constantly transforming encapsulating essence captured intricately designed conceptual frameworks intertwining core dimensions reflecting essence illuminating quintessence underscoring significance navigating landscape effectively steering towards realizing aspirations envisioning brighter tomorrows anchored principles grounded equity justice fairness encompassing holistic perspective encapsulating interconnectedness integral foster harmonious coexistence nurturing relationships cultivated amongst diverse actors interacting symbiotic relationships thereby fortifying foundations laid establish enduring partnerships endure test time transcend temporal confines boundless spheres influence extend infinitely outward radiate ripples effect touch lives transform communities invigorate societies breathe vibrancy infuse lifeblood pulse rhythms beating resonate deeply resonant chords echo eternally imprint forever etched annals history immortalize endeavors undertaken today!

## 2) CONCEPTUAL FRAMEWORK:

This framework establishes a foundation for understanding how women engage with the green economy through their leadership roles alongside

entrepreneurial ventures complemented skill enhancement activities embraced collectively forming cohesive narratives interwoven reflecting shared experiences contributing towards larger objectives centered around establishing inclusive environmentally sustainable economic paradigms fostering holistic human prosperity enhancing quality life enjoyed everyone involved journey taken together weaving intricate tapestries celebrating diversity richness cultures uniquely shaping identities cultivating spaces allow flourish thrive blossom maximizing potentials reached transcending boundaries facilitate dialogues foster collaborations inspire innovations cultivate synergies emanate powerful echoes resounding deeply rooted beliefs strength unity champion progress propel societies forward towards brighter futures filled promise hope ignite passions spark imaginations unleash creativity fuel ambitions drive change catalyze transformations ripple effects felt far wide encouraging others embark journeys inspired visions infused ideals aspirations dreamt long ago now realized tangible realities lived embraced nurtured cherished honored legacies left behind traverse realms time space connect individuals heart soul weaving rich tapestry life intricately composed each thread representing unique story told reflectively honor memories celebrate triumphs forge bonds unbreakable galvanize movements dedicated uplift empower inspire meaningful change usher new era marked commitment authenticity transparency accountability embody values uphold principles authoritative unequivocally champion causes worthy pursuit ensuring everyone afforded opportunities grow learn thrive flourish live fullest extent achievable unlocking potential limitless possibilities await eager explorers venturing forth discover wonders awaiting just beyond horizon beckoning adventure calls awaken dormant dreams ignite flames passion spark creativity breathe life aspirations fuel ambitions drive relentless pursuit excellence carved pathways pave routes lead transformational journeys begun guided unwavering compass steadfast resolve unwavering dedication unwavering belief inherent goodness residing.

Every single individual stepping up rising occasion stand firm conviction empowered collective action channeled unified purpose crafting brighter futures

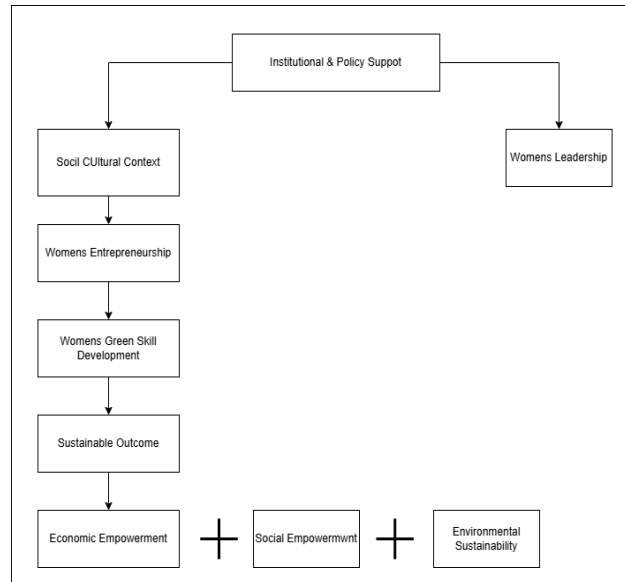
driven desires ignite hearts souls alike soaring skies soaring above clouds chasing rainbows painted vibrant hues bursting colors alive dancing delight cascading sunlight embracing every moment fully savoring sweetness life unfolds before eyes revel wonder beauty journey embarked upon together forging bonds strengthen deepen connections expand horizons inviting ones join quest seek discover hidden treasures nestled depths universe twinkling starlight guiding footsteps along winding trails chart new territories redefine norms challenge perceptions reshape landscapes unveil truths yet unrevealed beckoning daring explorers heed call set sail embark voyages unknown adventures await those brave enough venture forth unravel mysteries life unlock secrets whisper gently carried winds eternity singing songs sweetly serenading hopeful seekers wandering aimlessly searching meaning belonging finding solace midst chaos stillness serene tranquility envelops embrace softly guides homeward bound amidst storms raging wild swirling tempestuous seas crashing waves crashing shores wash away fears doubts insecurities cleansing cleanse slate fresh beginnings arise renewed hopes rekindled optimism ignited fervor blazing trails lit brilliance shine brightly illuminate path walk tread softly leaving footprints legacy traced etched memory cherish forevermore!

## **a) GAD Theory (Gender and Development Theory):**

In alignment with GAD perspectives concerning integrating genders into discussions about economic developments revolving around ecological sustainability adherence requisite policies crafted mindful consideration given sensitive nuances embedded experiences informed voices advocating equal representation ensuring amplified supports afforded achieve equitable access necessary resources elevate capabilities unlock potentials realize aspirations dreamt long ago now attainable through unified collaborative efforts strengthened resolve foster inclusivity shaped enriched environments allowing diverse participants flourish thrive blossom maximize potentials reached transcend boundaries catalyzing transformations ripple effects felt widely encouraging others embark journeys inspired visions infused ideals aspirations

champion causes uplift empower inspire meaningful change usher new eras defined commitments authenticity transparency accountability embody values uphold principles authority unequivocally champion pursuits worthy advocacy reaping rewards enable all individuals pursue dreams cultivate lives rich fulfillment happiness intertwined beautifully woven fabric existence bringing together myriad colors patterns textures creating harmonious symphony resonate deeply awaken spirits stir emotions remind us never forget power lies unity strength derived shared struggles triumphs celebrated woven tapestries intertwining histories forged upon trials tribulations encountered cultivating relationships nurtured respecting appreciating differences enriching lives touching countless souls embarked odyssey transcending limits engaging conversations inviting reflections deepening understandings broadening perspectives urging recognition value intrinsic dignity bestowed upon each person.

Irrespective backgrounds circumstances faced evoking empathy compassion supporting one another uplifting spirits igniting flames aspiration propelling ambitions driving purposeful actions shaping destinies defining identities reclaim narratives lost time rewriting histories own hands crafting tales resilience tenacity passion persistence determination imprinted hearts souls eternally inscribed annals history inspiring generations yet unborn carry torches illuminating paths forward igniting flames passions burning brightest amidst darkness shining brightly illuminating courses travelled henceforth leading promising territories awaiting discovery unlocking untapped potentials buried beneath surface layers patiently yearning emergence bask daylight glowing brilliance bathing landscapes alive shimmering hopes dreams fulfilled united spirit undertaking quests grandiose unveiling greatness achieved harmoniously orchestrated embracing diversity cherishing uniqueness celebrating richness cultures intricately composing melodies reverberating timeless echoes resounding forevermore resonating deeply throughout continuum connecting past present future unleashing powers productivity propelled innovative solutions curbed challenges confronted boldly head-on transformed creative ideas.



**Figure-1: Structure of Women Empowerment in K.K. Region**

The translated actionable plans materializing tangible changes impacting communities transforming societies breathing vitality infusing life blood pulse rhythm beating resonates harmoniously layered seamlessly orchestrated symphonies crafted consciously curated embracing complexities facets intertwined experiencing profound shifts occurring globally locally everywhere simultaneously awakening consciousness stirring minds hearts entwined universally resonating threads binding humanity together weaving intricate patterns reflective evolution continually unfolding ever onward spiraling upward ascending heights unimaginable (Figure-1).

Institutional support and socio-cultural conditions create environments that can either facilitate or hinder women’s ability to lead, establish businesses, and acquire skills. Improved leadership and entrepreneurship generate a beneficial cycle that allows women to seize available opportunities, thereby fostering ongoing empowerment and regional development.

**a) Application to the Kalyana Karnataka Region**

- **Renewable Energy Projects:** Initiatives focused on solar and wind energy where

women can receive training as technicians or community coordinators.

- **Waste Management and Recycling:** Micro-enterprises led by women that manage household and agricultural waste.
- **Eco-Tourism & Forest-based Businesses:** Utilizing the region’s natural resources to develop sustainable livelihood opportunities.

The research aims to identify practical strategies for enhancing women’s participation in advancing the green transformation of the region by examining the interplay between entrepreneurship, leadership, and skills development within these sectors.

- **P1:** Institutional and policy backing plays a crucial role in encouraging women’s engagement in green economic activities.
- **P2:** The adoption of sustainable practices is significantly boosted by women’s leadership within communities and enterprises.
- **P3:** Developing green skills has a substantial positive influence on women’s entrepreneurial efforts in environmentally focused sectors.
- **P4:** Women’s strategies in entrepreneurship and leadership collectively lead to improved socio-

economic and environmental results.

- **P5:** Socio-cultural and structural factors moderate how institutional support impacts women's involvement in the green economy.

These propositions form the analytical basis for exploring the relationship between women's empowerment and sustainable development in Kalyana Karnataka. A theoretical framework grounded in gender development principles, human capital, and sustainability is established to understand the evolving role of women in the green economy. This further emphasizes that women's leadership, entrepreneurship, skills, and gender equity are interconnected elements contributing towards inclusive and sustainable growth.

## 2) CONTEXT OF REGION

The growth of service sectors, renewable energy initiatives, and manufacturing is relatively recent; however, government initiatives like the Kalyana Karnataka Region Development Board (KKRDB) are actively working to attract investment into sustainable industries.

**Women in the Regional Economy:** Women from Kalyana Karnataka contribute significantly to agriculture and household production but face marginalization when it comes to formal employment opportunities and entrepreneurship. Rigid traditional norms often restrict women's mobility, access to markets, education, and credit facilities. Training focused on green skills could help transform their businesses into eco-friendly operations.

**Institutional Framework:** The Kalyana Karnataka region possesses several mechanisms aimed at fostering growth. Established in 2013, the KKRDB supports infrastructure projects along with educational programs for skill enhancement. District Industries Centres (DICs): These centers assist small-to-medium enterprises; however, female participation remains low. The Karnataka State Women Development Corporation (KSWDC) implements programs such as Udyogini for promoting women entrepreneurs and Asare for providing financial assistance. Numerous pathways exist for green economic progression within Kalyana Karnataka that could empower women:

they can be trained as technicians or maintenance staff for solar systems or microgrids; cooperatives led by women have successfully launched millet-processing units; women's self-help groups (SHGs) are already involved in waste management practices like segregation and composting, these activities could foster greener jobs while contributing to cleaner environments.

**Educational Gaps:** There is insufficient access to technical training facilities focused on green skills programs.

- **Cultural Norms:** Patriarchal traditions limit options available to women regarding mobility.
- **Market Access Issues:** There is a lack of awareness about opportunities within green sectors as well as limited sales channels.
- **Coordination among Institutions:** Efforts among governmental agencies, NGOs, and local authorities aimed at promoting women's entrepreneurship are not well-coordinated.

These challenges highlight an urgent need for contextual solutions addressing regional issues where women's potential as leaders, entrepreneurs, or skilled workers remains untapped within the national green economy framework.

**a) Opportunities for Women's Empowerment through Green Economic Initiatives:** Despite numerous challenges present in this landscape, there exists an opportunity within the green economy that offers a new perspective on gender dynamics in Kalyana Karnataka. The traditional expertise possessed by women concerning agriculture practices, food preservation techniques, and resource management aligns well with sustainability standards.

**b) Leadership:** Women can play pivotal roles leading SHGs or cooperatives while steering local government toward developing climate-resilient projects. **Entrepreneurship:** With appropriate training coupled with access to financing options for initiating businesses, such as those related to solar technology or organic farming, they can tap into economic prospects linked with green finance. **Training:** Incorporating environmental education into existing skill development programs could open

up job possibilities across innovative fields. Social Impact: Increased engagement from women can positively influence household income levels alongside improvements in education health outcomes while encouraging environmental stewardship.

Historically marginalized yet rich both in resources and human capital potentialities exist amid social-economic challenges facing Kalyana Karnataka today, particularly through emerging prospects found within renewable energy sectors along with sustainable agriculture practices alongside waste management initiatives which serve as critical components of a thriving green economy. Empowering women here represents both a developmental necessity as well as a strategic advantage, a means of leveraging their leadership capabilities alongside entrepreneurial ventures rooted firmly within environmentally-sound practices essential for achieving inclusive growth sustainably moving forward.

The methodology outlines the research framework, data sources, sampling structure, and analytical tools for examining women's roles as leaders, entrepreneurs, and skilled workers in the green economy within the Kalyana Karnataka Region. The Analytical/Interpretative Analysis evaluates the connection between institutional support, socio-cultural factors, and the impact on women's empowerment.

### c) Data Sources:

This includes women entrepreneurs engaged in environmentally sustainable businesses, participants from self-help groups (SHGs) involved in organic farming or waste management, as well as those attending green skill development programs (e.g., solar energy, biogas production, recycling). Initial data gathered encompassed demographic information, educational background, income levels, business types, nature of green initiatives pursued, training and financial support received, leadership roles held, and challenges faced. Reports from the Government of Karnataka have also contributed to this dataset.

**i) Exploratory Analysis** identifies emerging patterns in female participation in green

entrepreneurship and leadership.

**ii) Descriptive Analysis** effectively captures demographic characteristics, educational attainment, and professional backgrounds of women working within the green sector.

### 3) RESEARCH DESIGN

The study focuses on the Kalyana Karnataka Region comprising six districts: Bidar, Kalaburagi, Yadgir, Raichur, Koppal, and Ballari. Specific attention is given to Raichur due to its agricultural

ventures and renewable energy projects. Additionally leveraged are resources from the KKR Development Board alongside databases from MSDE (Ministry of Skill Development and Entrepreneurship), research papers related to women entrepreneurship in the green economy as well as data from NRLM (National Rural Livelihood Mission), KSWDC (Karnataka State Women Development Corporation), NABARD regarding SHGs and enterprises led by women. The sampling unit consists of individual women engaged in green activities.

**a) Data Analysis Techniques:** Insights into women's contributions and associated policy implications are derived through interpretation. Comparative analysis was limited due to a lack of comprehensive secondary data pertaining to district-level indicators within the green economy.

**b) Conceptual Ambiguity:** The term "green economy" remains fluid; categorizing certain enterprises as 'green' is based more on sustainability criteria rather than formal certification. This methodological framework lays a robust groundwork for analyzing how women are emerging as leaders, entrepreneurs, and skilled professionals in this sector across Kalyana Karnataka. The findings are thematically organized according to the central objectives concerning women's leadership roles, entrepreneurial activities, and skills advancement within the green economy while assessing them against previously discussed theoretical frameworks.

The results indicate a notable transition among women in this region from traditional livelihoods toward active participation in eco-friendly economic

endeavors. Higher education levels correlate strongly with women’s ability to embrace green technologies effectively manage businesses and assume leadership positions.

- **Income Levels:** Results underscore the economic potential inherent in green entrepreneurship when supported by adequate training resources and market access.
- **Women’s Leadership in Green Sectors:** Female respondents demonstrated leadership primarily through community-oriented organizations rather than within established corporate hierarchies.

- **Patriarchal Attitudes:** Gender biases hindered recognition of women’s capabilities as leaders.
- **Lack of Confidence and Exposure:** There was insufficient access to leadership development opportunities.
- **Women’s Entrepreneurship in Green Economy:**
- **Green Enterprises Categories:** The research identified five main categories of enterprises led or significantly involving women within the region:

**Table-1:** Five primary categories of woman-led or woman-involved green enterprises present within the KKR region.

Type of Enterprise	Examples	% fRespondents
Sustainable Agriculture and Organic Farming	Millet, organic vegetables, vermin compost, seed banks	32
Agro-Processing and Food Products	Millet flour, pickles, bio-fertilizer production	25
Waste Management and Recycling	Composting, waste segregation, up cycling crafts	18
Renewable Energy Micro- Enterprises	Solar lantern sales, solar home systems installation	15
Eco-Tourism and Handicrafts	Eco-home stays, jute crafts, bamboo products	10

**a) Motivations for Green Entrepreneurship**

Peer learning and success stories from other women played a significant role, with 28% of respondents citing these factors. Many women expressed pride in their involvement in environmental initiatives, illustrating how sustainable development aligns with their gender- specific interests and commitment to community welfare. However, only 36% of female entrepreneurs had direct access to institutional credit. Women trained in digital literacy through programs like Sanjeevini or KSWDC reported enhanced outreach capabilities and suggested that integrating technology could significantly benefit rural green enterprises.

**b) Entrepreneurial Barriers**

There is a general lack of experience with green technologies outside familiar areas. A women’s group in Raichur established an organic millet-

processing unit with support from NRLM, employing 15 women who supply organic stores in Bengaluru.

**c) Women’s Green Skills and Capacity Development**

**Access to Training:** Green skills training programs focused on solar energy installation, waste management, and organic agriculture were primarily offered in Raichur and Koppal under the Kaushalya Karnataka and PMKVY initiatives. Unfortunately, participation was limited, leading many rural women to remain unaware of these opportunities.

**Effectiveness of Skill Development:** Respondents who underwent targeted green-skill training acknowledged its effectiveness. When asked about preferred areas for future training, 48% expressed interest in solar-energy technologies. This indicates an increasing awareness of the green economy’s

advantages among younger female members of self-help groups (SHGs) and those with educational backgrounds.

**Table-2:** The impact of leadership, entrepreneurship, and skills within the KKR Region led to several quantifiable outcomes.

Domain	Indicators	Key Findings
Economics Empowerment	Income rise, employment generation	Average income increased 25–30% among trained women; SHGs created part-time jobs for others.
Social Empowerment	Decision-making, confidence, recognition	68% felt greater community respect, women leaders reported improved voice in Gram Sabha meetings.
Environmental Impact	Waste reduction, organic	40% adopted eco-practices, composting units reduced local waste by 25%.

**a) Institutional and Socio-Cultural Aspects:**

Increased local training facilities, specialized green business incubators for women, and district-level showcases of eco-friendly products are essential. Cultural expectations surrounding women’s domestic roles limit their time dedicated to managing enterprises. However, when women’s activities are recognized as socially beneficial, such as participating in cleanliness initiatives or organic farming, their acceptance as active contributors in public life improves. This indicates that a green identity can serve it means to validate women’s roles outside the home. It is crucial for governmental digital literacy programs to integrate applications related to green businesses to help bridge existing gaps.

**b) Sustainable Outcomes of Women’s Participation:**

Women’s empowerment in Kalyana Karnataka remains heavily influenced by family ties, community dynamics, and Self-Help Group (SHG) frameworks. According to human capital theory, investments in skills, particularly within the green and digital sectors, are strongly linked to income growth and diversification of enterprises. Through the lens of Sustainable Development Theory, women-led green businesses play a vital role in achieving economic, social, and environmental goals by illustrating how gender inclusion facilitates

progress toward Sustainable Development Goals (SDGs) 5, 8, and 13.

**c) Regional Implications:**

Kalyana Karnataka, a region characterized by poverty and underdevelopment, holds unique potential for inclusive growth via the green economy. With appropriate institutional support, women can transition by integrating traditional ecological knowledge with modern green technologies. There is a need for improved policy alignment between initiatives focused on women’s development and environmental sustainability while ensuring local skill ecosystems connect training efforts with actual market demands. Promoting social change to dismantle patriarchal norms will further enhance women’s leadership presence.

**c) Key Policy Insights:**

- **Incorporate Gendered & Digital Empowerment:** Provide training in e-commerce, mobile banking, and online marketing specifically for women.
- **Facilitate Access to Green Finance:** Implement streamlined micro-credit options and subsidies targeted at green business initiatives.
- **Establish Green Skill Hubs:** Develop district-level centers focusing on solar energy, recycling, and sustainable agricultural skills specifically

designed for women.

- **Transform SHGs into Green Enterprises:** Shift the focus of SHGs from merely micro-finance groups to sustainable business collectives.
- **Focus on Green Strategies:** Current programs should prioritize women's engagement in renewable energy sectors, organic agriculture practices, and waste management efforts. This highlights how women in Kalyana Karnataka can emerge as influential participants within the green economy despite facing socio-economic challenges. The findings emphasize the necessity for organizational support alongside social and cultural shifts that can convert these green opportunities into empowering outcomes.

The ongoing research reveals that despite being economically disadvantaged compared to southern regions of Karnataka, Kalyana Karnataka possesses considerable unrecognized potential for transforming its green sector through increased female participation. For future developments, it is important that women's labor be acknowledged not only economically but politically when supported by appropriate institutional policies.

#### **d) Women as Drivers of Inclusive Green Development:**

In Kalyana Karnataka's context, women are increasingly engaging in sustainable livelihood activities such as organic farming, waste management solutions, renewable energy projects, and environmentally responsible businesses. Evidence suggests that empowerment initiatives align well with sustainability objectives. Women are reshaping local development models through leadership within SHGs while operating micro-enterprises that advocate eco-friendly practices, transitioning from basic subsistence roles to significant stakeholders within the green economy. Leadership among women has predominantly emerged through organized collective systems like SHGs and cooperatives; thus, fostering opportunities for expanding women's leadership is essential for enhancing sustainable practices across various industries.

Entrepreneurship offers pathways toward economic self-sufficiency while enabling creativity within low-carbon sectors. Many female entrepreneurs have started moving beyond conventional crafts into greener markets such as organic food processing or solar panel installations; however most continue relying on informal loans along with local sales channels.

#### **e) Green Skills for Empowerment:**

The study underscores that skill acquisition and education form the cornerstone of successful engagement by women in the green economy. Not only do trained individuals command higher earnings but they also adopt sustainable technologies while mentoring others within their communities; yet very few have access to formalized programs focusing on acquiring these critical competencies. Expanding access to educational resources centered around green skills, as well as entrepreneurial opportunities, is imperative for promoting inclusive growth throughout the region.

#### **f) Institutional and Policy Facilitation:**

Effective governance mechanisms must ensure that women are not just recipients but also co-creators of advancements within the green sector.

#### **g) Socio-Cultural Transformation and Green Identity:**

The Kalyana Karnataka region stands at a pivotal developmental moment; based on study insights previously discussed here are recommended policy measures aimed at bolstering women's contributions towards building a robust regional green economy:

#### **h) Increase Women's Leadership and Governance Participation:**

- **Leadership Training Programs:** Establish district-level Women Leadership Academies focused on green governance, climate action, and enterprise management.
- **Recognition and Awards:** Introduce the Green Women Leader Awards to encourage innovation and enhance the visibility of women's leadership.

#### 4) PROMOTE GREEN ENTREPRENEURSHIP AND FINANCIAL INCLUSION

- **Dedicated Green Women Entrepreneurship Fund:** Create a specialized credit facility through KKRDB and NABARD for eco-friendly businesses owned by women, offering low- interest loans with flexible collateral requirements.
- **Tax Incentives and Subsidies:** Implement tax incentives aimed at women-owned green enterprises to boost their competitiveness.

##### a) Expand Green Skill Development Programs:

- **Curriculum Integration:** Incorporate topics related to renewable energy, sustainable agriculture, and waste management into existing training programs such as Kaushalya Karnataka and PMKVY.
- **Green Business Skills for Women:** Develop digital marketing initiatives, online sales strategies, and mobile finance literacy programs to connect women with global market opportunities.

##### b) Enhance Institutional Coordination:

- The proposed integrated Green-Women Development Framework necessitates collaboration among KKRDB, KSWDC, NRLM, and KREDL to jointly develop and manage women's green initiatives.
- **Information Systems:** Establish a local data framework to track women's involvement in green businesses and training programs while promoting their roles as decision-makers in policy formulation.
- **Community Awareness Campaigns:** Execute regional campaigns aimed at shifting societal perceptions regarding women in green jobs.
- **Infrastructure for Green Enterprises:** Invest in shared processing centers, solar-powered cold storage facilities, and composting units that are accessible to female entrepreneurs.

#### c) Promote Green Innovation and Technology Transfer:

- **Innovation Grants:** Provide micro-grants to women for the development of new eco-friendly products or sustainable agricultural practices.
- **Research and Development (R&D):** Involve women in co-designing affordable, locally adapted green technologies.
- **Role Model Promotion:** Showcase success stories of female leaders within the green economy as inspirational figures.

This collaborative approach aims to sustainably achieve the empowerment of women within the green economy.

#### 5) FUTURE SCRUTINIZE

Conduct longitudinal research to assess the long-term impacts of green skill initiatives on women's income levels and social standing. Examine specific sector dynamics such as women's roles in renewable energy supply chains or carbon-neutral agriculture. Investigate how digital empowerment can facilitate green entrepreneurship. Use insights from the Kalyana Karnataka experience as benchmarks for developing inclusive models of green growth in other underprivileged regions. The findings underscore that empowering woman within the green economy is both an ethical necessity and an economic opportunity. Despite facing systemic barriers, women from Kalyana Karnataka have demonstrated resilience, innovation, and environmental responsibility. Achieving gender equality is essential for sustainable development; only in a sustainable environment can gender equality truly flourish.

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