

Sustainable Development Through Green Entrepreneurship: Insights from Karnataka

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Abstract:

The rising global awareness on the issues related to climate change and sustainable development has caused a major shift in Indian markets. Now a days, there is noticeable inclination among customers towards green products instead of traditional products. They become more environmentally and socially responsible. In response to this trend, many entrepreneurs grabbed the opportunity by innovating and redesigning their products with green perspectives. This leads to the emerging of green entrepreneurship which is a vital strategy for driving sustainable development. The concept green entrepreneurship slowly gaining importance in the Indian market. This paper explores the landscape of green entrepreneurship, highlighting key environmental sustainability and sustainable development.

The study aims to explore the connection between green entrepreneurship and sustainable development in Karnataka. It involves assessing how green businesses reduce environmental degradation through waste reduction, resource efficiency, and renewable energy usage. The study also explores the various policies and programmes introduced by central government as well as state government of Karnataka to promote green entrepreneurship. This study focuses on the various government policies such as renewable energy policies, Start-up India initiative and Green Skill Development programme. The paper also highlights the efforts of leading sustainable companies in Karnataka. This paper underscores the importance of creative solutions, teamwork within networks, policy alignment to encourage green entrepreneurship in India. Business owners who successfully combine their profit ambitions with protecting the environment are vital players in shaping a sustainable future for the economy.

Keywords: Green entrepreneurship, Eco-preneurship, Green Innovation, Sustainable development.

Introduction:

The consequences of change in climate and environmental decline constitutes a substantial and urgent risk to economic development, health of community and the livelihood of people across the world. If no quick steps are taken which are aimed at mitigation and adaptation, it is predicted that the world's GDP could experience a contraction of 18% within the next 30 years. India has the second largest population with 1.45 billion population. The effect of change in climate leads to significant threats to the economy and livelihood of the country. The Small and Medium Enterprises plays a significant role in the economic development by contributing to the growth of GDP. The SMEs are potential contributors to climate change solutions. But the SMEs are notably impacted by climate shocks, showing greater sensitivity to the

subsequent price volatility and supply shortage. The effect of changes in climate heightens the pre-existing obstacles confronting Indian enterprises which are running on small scale, including issues related to resource availability and infrastructure. Therefore, it is necessary for policymakers to advocate for green entrepreneurs as they contribute to climate and environmental sustainability. In recent decades sustainable development has slowly gaining importance in India. There is a growing awareness among customers regarding buying products and its effects on environment. There has been a huge transformation in consumers preferences, lifestyles over the last few years and the consumers are shifting towards eco-friendly products and the products environmentally sustainable. This shift in buying habits of consumers leads to the demand for environmentally friendly goods and green markets.

Green entrepreneurship:

Green entrepreneurship is characterized by the formation and management of novel business ventures that yield a favourable impact on the environment. This strategy is aligned with the comprehensive goal of sustainable development, which endeavours to fulfil the needs of the current generation.

Sustainable Development:

Sustainable development represents a strategy for growth and human advancement that seeks to fulfil today's needs while also looking out that the next generations can also find satisfaction to fulfil their own requirements. This principle underscores the importance of achieving a harmonious balance among economic progress, environmental stewardship, and social welfare. In the context of green entrepreneurship, sustainable development pertains to the establishment and operation of businesses that prioritize both balancing economic growth with keeping our environment safe and social well-being. Green entrepreneurs focus on creating products, services, and processes that lower the environmental harm, save natural resources, and advance social equity.

Literature review:

Sanjeela Mathur et.al (2016), their study investigates the opportunities and challenges faced by green entrepreneurs in India, particularly among millennial demographic. The study underscores the immediate requirement for the sustainable strategies to tackle the issues of deterioration of the environment and challenges posed by change in climate which are urgent concern on a global scale.

Stuti Haldar (2019), the paper on 'Green entrepreneurship in theory and practice insights from India', explores the emergence of green entrepreneurship in India, which is largely influenced by the growing consumer preference for ecofriendly products within the framework of climate change and sustainable development concerns. It introduced conceptual framework that connects environmental, economic and social dimensions that encourage green entrepreneurship, underscoring its significance in promoting sustainable development.

Thomas Neumann (2022), The study investigates the relationship between green entrepreneurship and the three pillars of sustainable development - economic, social and environmental outcomes. They suggest that green entrepreneurship helps for economic growth and social benefits. The research emphasizes the significance of taking into account the degree of economic development when evaluating the impact of green entrepreneurship. Overall, the study contributes to the growing discourse on sustainable entrepreneurship by revealing the potential of ecofriendly ventures to establish a synergistic relationship between economic and social development while also reducing environmental harm.

Lokesh K (2022), A study on green entrepreneurship in India explores the concept of green entrepreneurship, which involves environmental social and problems through entrepreneurial activities that are both environmentally beneficial and financially sustainable. It highlights the increasing significance of green entrepreneurship in India and the necessity for individual to take responsibility for environmental stewardship. The findings of the paper suggest that the incorporating of sustainable practices in business operations is essentials for achieving sustainable growth.

Parminder Kaur et.al (2023), the research paper titled Green entrepreneurship in India: A study of select green business, explores the green entrepreneurship concept by considering sustainable development and environmental awareness in India. It highlights the change in preference of consumers towards ecofriendly products, leading to the emergence of green entrepreneurs who aim to create awareness and promote sustainable practices. The study emphasizes the importance of integrating environmental education in early learning stages to cultivate a sustainable mindset in future generations.

Research Gap:

The concept green entrepreneurship is of a recent origin. There is lack of studies which covers broader aspects of green entrepreneurship, sustainable development. The existing literatures focuses on theoretical aspects or conceptual framework on green entrepreneurship and case studies of successful green entrepreneurs in India. In addressing the obstacles associated with sustainable development through green entrepreneurship, notable attention has been placed on the national and global dimension. The present study bridges the gap by conducting in-depth analysis of governmental support and entrepreneurial achievements in relation to sustainable development in Karnataka.

Objectives of the study:

- 1 To investigate the impact of green entrepreneurship on sustainable development.
- 2 To explore the initiatives taken by Government of India to promote green entrepreneurship.

Research methodology:

The exploratory research method is adopted for the present study as the area of research is relatively new and not extensively explored. This method enables the study to collect the information from secondary sources as various journals, existing literatures, government reports, articles, and other online sources and websites.

Overview of green entrepreneurial activity in India.

The adverse impact of climate change in India are extensive and posing significant risks to agriculture, security of food, conservation of energy, water preservation and health of public. natural disasters associated with change in climate such as factors such as intense heat, variations in rainfall patterns, droughts, the melting of glaciers, and elevated sea levels are among the critical issues that can drive migration and lead to conflict. For examples extreme heat experienced in march 2022 resulted in forest fires, devastated agricultural land across India and Pakistan. Over the course of last ten decades, there has been an increase in the frequency of days with severe rainfall in India. Approximately 50% of the Indian population relies on agriculture and various fields that are influenced by climate conditions. The effect of climate change on these sectors leads to negative result on economic growth.

The green entrepreneurial activity in India can be classified into five categories: Low carbon energy, management of ocean and land, management of water and waste, transportation and the built environment. Each category has distinct sectors which contains many business models which is mentioned below

Figure 1 Green Sector Groups and Sectors

Low carbon energy	Land and ocean management	Water and waste management	Transportation	Built environment
Energy efficiency and storage	Sustainable agriculture and aquaculture (e.g crop diversification and micro irrigation)	Water management (e.g collection, treatment and supply)	Sustainable transportation (e.g. electric vehicles, charging infrastructure)	Green building (e.g. retrofitting new builds)
Renewable energy (e.g. grid tied renewables and off grid renewables)	Sustainable forestry (e.g reforestation, carbon sequestration, afforestation)	Waste management and circular economy (e.g solid waste sewerage, post use processes.)		Disaster management (e.g developing, monitoring and response system)
Cleaner fuel (e.g. biofuels, green hydrogen)	Eco-tourism (e.g eco lodging, eco-tours, agro tourism)			

Source : Aspen Network Development Entrepreneurs report 2023 on Building the green economy : trends and opportunities for green entrepreneurship in India.

Impact of green entrepreneurship on sustainable development.

Green entrepreneurship plays crucial role and has significantly contributed to sustainable development in India by fostering innovation and addressing environmental challenges. The key impacts of green entrepreneurship on sustainable development are as follows:

- 1. Economic Growth:** Green markets have created new markets opportunities, particularly in sectors like renewable energy, waste management and sustainable agriculture. The potential market for green building is anticipated to be more than one trillion US dollars. Moreover, green entrepreneurship promotes job creation in various fields, including organic farming, the production of sustainable products, and waste management
- 2. Environmental Benefits:** Eco-entrepreneurs are providing solutions that reduce environmental harm. This includes initiatives in energy efficiency, leaner fuel, the circular economy which help to mitigate climate change and promote resource conservation. Green entrepreneurs often focus on the minimisation of carbon emission by implementing energy efficient practices and promoting the usage of energy sources which are renewable. Business involved in recycling, upcycling and management

- of waste contribute in minimising the environmental effect of waste and promoting circular economy.
3. **Social Impact:** Green entrepreneurship also drives social change by providing employment opportunities and promoting sustainable practices. This aligns with the Sustainable Development Goals (SDG) and supports inclusive growth.
 4. **Policy Support:** Government initiatives like start-up India and various state level programme have bolstered the green entrepreneurship eco-system. Providing necessary funding, infrastructure and policy frameworks.
 5. **Innovation and technology:** Green entrepreneurs are leading the way in technological advancement. Innovations in solar energy, electric vehicles and sustainable farming techniques are reducing the carbon emission and promoting cleaner alternatives.
 6. **Education and awareness:** Green entrepreneurs play major role in creating awareness on environmental issues. They educate customers about importance of sustainable practices and environmental conservation through their products.
 7. **Resource efficiency:** By encouraging the utilization of renewable resources and the reduction of waste, environmentally conscious businesses facilitate the efficient management of resources. This practice not only safeguards natural resources but also lessens the ecological footprint of both production and consumption activities.

Government initiatives for promoting green entrepreneurs.

In its dedication to sustainable growth and the mitigation of environmental challenges, India has been promoting green entrepreneurship actively. Several initiatives from the government have been implemented to provide support for green business ventures. Some of initiatives of both government of India and government of Karnataka are as follows:

Start-up India: start-up India initiative launched in 2016, which aims to create a robust ecosystem for startups in India, including those focused on green and sustainable practices. The initiatives provide various incentives like tax benefits, funding support, and ease of doing business specifically targeting startups that contribute to sustainability and environmental conservation.

National Action Plan on Climate Change (NAPCC): The National Action Plan on Climate Change (NAPCC) serves as a framework for India's efforts to combat climate change and advance sustainable development. It features several key missions, such as the National Solar Mission, the National Mission for Enhanced Energy Efficiency, and the National Mission on Sustainable Habitat. These missions are designed to promote green entrepreneurship by creating avenues in renewable energy, energy efficiency, and sustainable urban development.

Pradhan Mantri Mudra Yojana (PMMY): The primary goal of this scheme is to deliver financial support to micro and small entrepreneurs. Green entrepreneurs are the beneficiaries of this assistance, as the scarcity of funding represents a critical obstacle for their ventures.

Green Skill Development Programme (GSDDP): Green Skill Development Programme is launched by Ministry of Environment, Forest and Climate Change. This programme aims to train youths in various green sectors. The programme promotes the employability of youths in green sectors and encourages them to take green entrepreneurship by providing necessary skills and knowledge.

Atal Innovation Mission (AIM): AIM is a flagship initiative by NITI Ayog to promote a trend of innovation and entrepreneurship in India. AIM supports innovations in sectors like renewable energy,

sustainable agriculture and water conservation, offering grants, mentoring, incubation support to green startups.

FAME India Scheme: Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME) India aims to induce the use of electric vehicles and hybrid vehicles. The scheme provides the subsidies and incentives for the production and adoption of EV's, encouraging startups in green mobility sectors.

Zero defect Zero Effect (ZED) Scheme: The ZED scheme encourages MSMEs to manufacture products which are environmentally sustainable and have minimal negative impact on environment. Enterprises following green manufacturing process receive certification and financial assistance.

Mission Startup Karnataka's Elevate Programme: This initiatives by the Government of Karnataka aims to identify and support innovative startups, including those focusing on green technologies. The programme provides funding, mentorship, incubation, networking opportunities to startups.

Centre for Entrepreneurship Development of Karnataka (CEDOK): It offers various training programmes and financial support and sustainable business practices to budding entrepreneurs which includes rural entrepreneurs also.

Karnataka Innovation and Technology Society: It promotes innovation and technology driven entrepreneurship, including green startups, through various programs and policies.

Green entrepreneurs – Some Case studies.

Selco India : Selco India was established in Bengaluru, Karnataka in the year 1995 by Harish Hande. They're one of the leading firms specializing in green energy solutions to weaker section and small enterprises. It focuses on providing decentralized solar energy systems specially designed to meet the requirements of marginalized communities. By offering affordable and reliable solar power solutions, Selco India significantly improves access to electricity, enhances living standards, and promotes economic growth. The company's initiatives include solar lighting, water heating, and energy systems for residences, schools, and businesses. Selco India's approach effectively combines technology with financial and social innovations, ensuring that sustainable energy solutions are both accessible and impactful

Jagruth tech limited: Jagruth Tech Limited, hailing from Mysuru, Karnataka, is doing some impressive work in combating plastic waste pollution. They've created a technology that converts non-recyclable plastic into eco-friendly interlocking paving blocks, offering a sustainable alternative to regular construction materials. This creative solution not only helps reduce plastic waste but also encourages the use of sustainable building alternatives. Their paving blocks are being used in various infrastructure projects, contributing to cleaner environments and promoting sustainability in the construction industry. The company's mission is in line with global efforts to tackle plastic pollution and boost recycling, turning them a key player in the circular economy by converting waste into useful resources and fostering sustainable development.

Saahas Zero Waste: Saahas Zero Waste, founded in 2013, is a social and environmental venture that aims to turn waste into valuable resources. Based in Bangalore, Karnataka, they offer a full range of waste management services that focus on recycling and resource recovery. By collaborating with local governments, businesses, and communities, Saahas Zero Waste sets up effective waste management systems that lessen reliance on landfills and encourage sustainability. Their work includes handling solid waste, running awareness campaigns, and promoting waste segregation right from the source. By transforming waste into resources, they play a key role in sustainable urban growth, enhancing waste

management practices, and minimizing environmental harm. Their initiatives are all about creating a cleaner, greener world while supporting the larger goals of sustainable development.

Deshpande Foundation: Deshpande foundation is a Hubballi based non-profit organisation which supports numerous agritech startups focusing on sustainable farming practices and rural development.

Ather Energy: It is a Bangalore based startup founded by Tarun Mehta and Swapnil Jain. Ather Energy is a leading electric vehicle company known for its smart electric scooters. They are making significant progress in promoting sustainable urban mobility.

Conclusions and suggestions:

The study reveals that green entrepreneurship is vital in driving sustainable development by encouraging innovation, reducing environmental impacts, and creating economic opportunities. Green entrepreneurs thus make significant contributions toward the attainment of the goals of sustainable development. Due to these prevailing governmental initiatives, including Startup India, National Action Plan on Climate Change, and various finance and skill development programs, the green entrepreneurship ecosystem has evolved as supportive in India. These efforts encourage the growth of eco-friendly businesses while keeping a close eye on key topics like energy efficiency, change in climate and saving resources. These outcomes highlight that green entrepreneurship is not just a way to promote environmental sustainability; it also fuels social and economic growth. In particular, it is necessary for entrepreneurs to raise the sustainable practices of their company models, thus contributing to the crafting of a more resilient and sustainable economy.

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