

A study of Government initiatives for promoting Green Entrepreneurship- with special reference to Uttarakhand

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Abstract - In today's era there is an alarming need to address adverse effects of climate change by implementing green practices. Green entrepreneurship as one of the important initiatives plays a vital role in addressing climate change thereby enhancing environmental sustainability, economic growth and attainment of UN (SDG 13) 'climate action'. The importance of nurturing a supportive environment for green businesses that underline sustainability and economic progress has been recognised by the Government of India. Thus, numerous government initiatives, schemes and policies have been announced to promote green entrepreneurship, with a stress on nurturing startup innovation, reducing environmental impact, and encouraging the use of sustainable technologies. In spite of these initiatives, there remains a need to know how efficaciously these policies are reaching and helping green entrepreneurs. This study is descriptive in nature, where various initiatives taken by both central and state are assessed with special focus on initiative taken by Uttarakhand government for promoting green entrepreneurship. By utilising data from various government reports, websites, academic journals, the research studies the efficacy of such policies in encouraging sustainable start-ups and finds areas for enhancement. This study seeks to examine government policies intended to support green entrepreneurship. The research highlighted targeted interventions to boost the green entrepreneurship ecosystem, thereby, contributing towards environmental sustainability, economic growth and attainment of SDG13.

Keywords: Green entrepreneurship, Sustainable development, Government policies, SDG13, Climate change.

I. INTRODUCTION

In today's era there is an alarming need to address adverse effects of climate change by implementing green practices. Green entrepreneurship as one of the important initiatives plays a vital role in addressing climate change thereby enhancing environmental sustainability, economic growth and attainment of UN (SDG 13) 'climate action'.

Uttarakhand's Himalayan landscape is both ecologically fragile and rich in opportunities for sustainable livelihoods based on agriculture, tourism, and biodiversity. In this context, the state government has increasingly promoted green entrepreneurship - business models that protect natural resources while generating incomes as a key strategy for sustainable development.

With the changes in industrial-policy design, the growth of entrepreneurship education programs, as well as a pilot-level conservation-linked livelihood projects have created a multi-layered ecosystem for eco-oriented enterprises. As the state encourages this shift towards green entrepreneurship, it becomes crucial to address the challenges faced by local communities in adapting to these new economic paradigms. Nevertheless, many rural entrepreneurs, especially those in ecologically sensitive areas, struggle with limited access to finance. The concept of community-based adaptive entrepreneurship (CBAE) emerges as a promising model, emphasizing resilience and adaptability in the face of environmental changes (Shahidullah, 2023). By nurturing a collaborative ecosystem that includes local stakeholders, government support, and capacity-building initiatives, Uttarakhand can enhance the sustainability of these enterprises, ensuring that they not only thrive economically but also contribute to the preservation of the region's unique biodiversity and cultural heritage.

II. LITERATURE REVIEW

2.1 Green entrepreneurship and Sustainable SMEs

With observed rapid growth in the general field of green study, green entrepreneurship, as a field of study is still at its infancy. A study by Pachecho et al. (2010) highlighted that there are some cross-road conceptual issues from the related fields such as Business Economics, Entrepreneurship, Finance, and Accounting, which are still not resolved. Green

entrepreneurship is considered as the creation and management of ventures that minimize environmental harm, conserve resources, and often generate positive ecological externalities. In addition to their ecological benefits, green entrepreneurship also plays a crucial role in fostering social equity and community development. By prioritizing sustainable practices, these ventures often create "green jobs" that not only provide employment but also empower local populations through education and awareness about environmental stewardship. (Sharma et al., 2022) Also, the incorporation of innovative technologies and sustainable resource management within these businesses can lead to improved productivity thereby, minimizing waste (Erick,2019). As such, green entrepreneurs not only contribute to a healthier planet but also serve as catalysts for social change, demonstrating that economic success and ecological responsibility can indeed coexist harmoniously.

Research on small and medium enterprises (SMEs) shows that even relatively simple eco-efficiency measures such as reducing energy and water use, reusing materials, and sourcing inputs locally can cut costs, improve brand image, and open access to niche markets.

In Uttarakhand, studies suggest that many SMEs already operate in sectors (food processing, handicrafts, eco-friendly manufacturing and tourism) where such green practices can be adopted without major technological overhauls. Also, the integration of green practices in these sectors not only aligns with sustainable development goals but also improves the sustainable competitive advantage of SMEs in Uttarakhand by appealing to environmentally conscious consumers. As the demand for sustainable products rises, these enterprises can leverage their eco-friendly initiatives to differentiate themselves in the marketplace, potentially leading to increased market share and profitability. Additionally, the adoption of green practices can result in cost savings through improved resource efficiency and waste reduction, which is particularly crucial for SMEs operating under tight financial constraints (Kavita & Bhatt, 2025). However, to fully realize these benefits, stakeholders must address the barriers faced by SMEs, such as limited access to funding for green technologies and inadequate knowledge about sustainable practices, to foster an environment

conducive to innovation and growth. (Singh & Thakar, 2018).

2.2 Policy-driven green entrepreneurship in Uttarakhand

a) Training Programme for Entrepreneurship Development in Biotechnology

This scheme "Training Programme for Entrepreneurship Development in Biotechnology" is implemented by the Uttarakhand Council for Biotechnology under the Department of Agriculture, Government of Uttarakhand. It aims to train youth in biotechnology and develop entrepreneurial skills thereby, providing technical knowledge, mentorship, and guidance to help them initiate biotech startup. Additionally, under this initiative taken by the state government of Uttarakhand training and technical information are provided to the youth of the state in order to promote entrepreneurship development and support them in starting startups in the field of biotechnology, along with support and guidance specific to the needs of the individuals.

b) Mukhyamantri Saur Swarojgar Yojana (MSSY)

The scheme "Mukhyamantri Saur Swarojgar Yojana" is implemented by the Uttarakhand Renewable Energy Development Agency (URED) under the Department of Energy, Government of Uttarakhand. The MSSY scheme represents a decentralized renewable energy model encouraging individual-level solar entrepreneurship. Studies indicate that such initiatives reduce rural distress migration and create stable income streams through long-term power purchase agreements. This scheme purpose is to promote self-employment among the residents of Uttarakhand by enabling them to establish and operate solar power projects, thereby generating clean energy and providing a sustainable source of income, thereby, encouraging entrepreneurship.

c) Solar Based Hydroponic System

The scheme "Solar Based Hydroponic System" is implemented by the Uttarakhand State Council for Science and Technology (UCOST) under the Science and Technology, Government of Uttarakhand. Its purpose is to develop and promote an innovative solar-based hydroponic system that integrates solar energy with modern greenhouse technology and mobile application support. A solar-based hydroponic system has been installed at UCOST Dehradun.

Benefit: The automated solar-based hydroponic system will help in reducing energy consumption, minimizing water usage, and improve crop yields. Additionally, the system also has the potential to serve as an entrepreneurial or business model and can be replicated in other Himalayan states, thereby creating improved livelihood opportunities for youth and hill farmers.

2.3 Entrepreneurship education and conservation-linked livelihoods

Beyond industrial policy, the state has also invested in entrepreneurship education as a soft lever for green-sector development. A 2024 study on Entrepreneurship Education: An Approach Toward Sustainable Development in Uttarakhand shows how the Devbhoomi Udyamita Yojana channels youth into organic farming, agri-food processing, tourism, AYUSH, heritage related enterprises, and other nature-linked sectors. Similarly, a 2023 workshop report on Conservation-linked Entrepreneurship documents a pilot in Uttarakhand (Chamoli) where women-led micro-enterprises were trained in:

- Organic farming and millet processing;
- Mushroom cultivation and dairy-based agri-products;
- Eco-tourism, home-stays and nature-based services.

These ventures were explicitly designed to combine livelihood creation with biodiversity conservation, illustrating how state-supported training can help communities translate green-entrepreneurship ideas into everyday practice.

2.4 Rural-entrepreneurship and sustainable development

A 2023 study on Rural Entrepreneurship in Uttarakhand argues that rural enterprise development must be embedded within a broader sustainable development strategy to avoid over exploiting natural capital. The study finds that rural-enterprise programs achieve better outcomes when they:

- Include environmental-awareness modules;
- Link financial support to low impact practices (such as organic standards and soil-conservation measures); and
- Encourage community level cooperatives and collective marketing models.

Such findings suggest that state-backed rural-enterprise schemes can act as effective

vehicles for scaling green-oriented entrepreneurship in remote, hilly areas.

2.5. Research Gap

Despite the growing policy attention and scattered empirical work, several gaps remain in the literature. There is limited study of how Uttarakhand's green-entrepreneurship schemes actually affect ecological outcomes (e.g., changes in biodiversity, water-use patterns, or emissions). This study aims to address these gaps by synthesizing recent case studies, policy documents, and entrepreneurship education literature to provide a clear picture of Uttarakhand's green-entrepreneurship ecosystem.

III. OBJECTIVES OF THE STUDY

The study aims to:

1. To study various policies and initiatives taken by state government for promoting green entrepreneurship in Uttarakhand.
2. To examine the concept of green entrepreneurship in Uttarakhand.
3. To evaluate the role of entrepreneurship education and conservation linked livelihood programs in shaping green entrepreneurship outcomes.
4. To identify the main challenges and practical constraints in scaling green entrepreneurship in Uttarakhand.
5. To suggest policy for strengthening the state's green entrepreneurship framework.

IV. RESEARCH METHODOLOGY

4.1 Research design

This study is descriptive in nature that combines Review based analysis of policy documents, government reports, and academic papers on Uttarakhand's green entrepreneurship initiatives. Case-study analysis of selected empirical studies, including sustainable SME practices.

4.2 Enterprise-level green practices

Evidence from Almora's SMEs reveals that many firms already engage in relatively simple but meaningful green practices. These include:

- Using eco-friendly packaging and minimizing plastic usage.
- Reducing energy and water consumption through basic operational changes.

- Sourcing raw materials from nearby farms or local suppliers to shorten transport distances.

The study notes that enterprises are more likely to adopt and sustain these practices when they receive financial incentives, technical guidance, and support in accessing markets that value eco-friendly products. This suggests that policy tools work best when they are accompanied by practical, hands-on support rather than operating in isolation.

4.3 Role of entrepreneurship education

The Devbhoomi Udyamita Yojana related study illustrates how integrating sustainability content into higher education curricula can shape students' career choices. The program includes modules on:

- Organic farming and Agri food processing.
- Eco-tourism and heritage enterprise management.
- AYUSH and herbal product businesses.

Students and recent graduates who participate in such programs are more likely to view green oriented sectors as viable and attractive options, not just as "environmental add-ons." This suggests that entrepreneurship education can act as a bridge between top-down policy signals and bottom-up enterprise behavior.

V. FINDINGS

- Case studies highlighted that many SMEs can adopt low cost, incremental green practices such as energy saving measures and local sourcing without major capital investment, provided they receive adequate support and market signals.
- Programs like Devbhoomi Udyamita Yojana show that embedding sustainability and eco livelihood content in higher education curricula can orient youth toward green-oriented careers and enterprises.
- While the policy framework is increasingly supportive, access to green entrepreneurship benefits is still uneven across gender, caste, and geography. Women and marginalized group entrepreneurs often face additional barriers in accessing information, training, and financial support, which limits their ability to fully participate in green-oriented opportunities.

VI. CHALLENGES

Several structural and practical challenges hinder the scaling of green entrepreneurship in Uttarakhand:

- Rural entrepreneurs, especially in remote hilly areas, lack awareness of available green-technology options and of the procedures for applying to subsidy schemes.
- Women, Scheduled Tribes, and other marginalized groups face barriers in accessing credit, technical training, and policy information, which reduces the overall inclusiveness of green entrepreneurship initiatives.
- There is little systematic tracking of whether green incentive schemes actually improve ecological outcomes, making it difficult to refine policies based on evidence.

VII. CONCLUSION

The Government of Uttarakhand has developed a multi layered policy ecosystem including industrial incentive schemes, renewable energy policies, entrepreneurship education programs, and conservation linked livelihood pilots to promote green entrepreneurship. However, challenges related to awareness, equity, and monitoring remain significant. Addressing these issues will be crucial if Uttarakhand is to position itself as a model for Himalayans state green entrepreneurship and sustainable development, where ecological protection and livelihood improvement go hand in hand. Additionally, the review indicates that while Uttarakhand has developed a progressive policy framework for green entrepreneurship, its effectiveness is constrained by implementation challenges, infrastructural limitations, and capacity gaps. Future research should focus on impact assessment, policy integration, and localized innovation models to strengthen the green entrepreneurial ecosystem.

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