

# Role Of Women in Sustainable Development of Uttarakhand Through Environmental Conservation

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**Abstract**—Women in Uttarakhand have played a significant role in environmental conservation, drawing from their deep connection with nature and the socio-economic context of the region. Women in Uttarakhand are integral to environmental conservation efforts through their leadership in grassroots movements, sustainable resource management, and the preservation of traditional knowledge. Their contributions are vital to maintaining the ecological balance and promoting sustainable development in the region. Women in Uttarakhand are increasingly involved in climate change advocacy, raising awareness about the impacts of climate change on their communities. They participate in various initiatives and campaigns to protect their environment from the adverse effects of global warming, such as glacial melting, erratic rainfall, and landslides. Traditional festivals and rituals in Uttarakhand often involve practices that honor and protect the environment. Women play a central role in these cultural activities, passing down knowledge and traditions that emphasize the importance of living in harmony with nature.

**Index Terms**—Uttarakhand women, Environmental Conservation, Sustainable Development, Govt. Initiative

## I. INTRODUCTION

Forests, often referred to as "Green Gold," are vital for life on Earth. They provide essential resources such as food, shelter, fodder, medicine, and fresh air, while also playing a crucial role in a country's economy. Forests act as natural air purifiers by converting carbon dioxide into oxygen and help prevent floods, soil erosion, and land degradation. In hilly states like Uttarakhand, forests are central to the region's socio-economic and cultural life due to their rich biodiversity and natural resources. However,

after the 1962 Indo-Chinese conflict, increased road development opened up these regions to exploitation by contractors and companies, leading to deforestation for timber, minerals, and hydroelectric projects. This deforestation has severe consequences in hill areas, increasing risks of air pollution, landslides, floods, and disasters like the 2013 Himalayan tsunami. Mountain development, involving blasting and tree-cutting, has caused significant environmental damage. Thus, Uttarakhand faces a critical challenge in balancing development with ecological preservation.

## II. METHODOLOGY

This study is based on secondary data collected from existing literature on women's contributions to environmental conservation and sustainable Development. Sources include research articles, reports, books, and conference proceedings found through many platforms. Both published and unpublished materials were reviewed.

Objectives:

- To recognize the contributions of women in environmental conservation in Uttarakhand
- To understand the role of women in sustainable development of Uttarakhand
- To identify opportunities for women in environmental conservation and sustainable development in Uttarakhand

## III. WOMEN IN UTTARAKHAND

Women in Uttarakhand, especially in remote hill areas, lead challenging lives due to economic insecurity and environmental imbalances. As forests

are their primary source of livelihood, deforestation has led many men to migrate in search of work, leaving the entire responsibility of the household to women.

Women not only care for their families, children, and elderly but also manage agricultural work, tend to livestock, and collect fuel and fodder from forests. They are deeply connected to the forest, which provides for their basic needs. Despite their hardships, these women remain strong and resilient, becoming the backbone of their families and communities. They live contentedly in their simple world and prefer to stay undisturbed by outside influences.

#### ENVIRONMENT CONSERVATION MOVEMENT IN UTTARAKHAND BY WOMEN

Women of Uttarakhand have been deeply involved in several impactful environment conservation initiatives, driven by their close relationship with nature and daily dependence on forest resources.

Their efforts include:

##### 1. CHIPKO MOVEMENT (1973)

Led by rural women, this non-violent movement involved hugging trees to prevent deforestation. It became a global symbol of grassroots environmental activism.

Women in Uttarakhand have played a pioneering role in environmental conservation movements, with the most iconic example being the Chipko Movement of the 1973. In this movement, rural women hugged trees to prevent them from being cut down by commercial loggers, sending a powerful message about forest protection and sustainable development.

Beyond Chipko, women in Uttarakhand have consistently been at the forefront of various grassroots efforts to conserve forests, protect water sources, and promote eco-friendly farming. Their deep connection to nature, shaped by daily dependence on natural resources, drives their strong commitment to ecological preservation.

Women-led groups and self-help organizations often engage in forestation, anti-mining protests, and campaigns against the construction of large dams and roads that threaten the local environment. These movements not only reflect women's environmental awareness but also their leadership in advocating for

the rights of their communities and future generations.

##### 2. MAITI MOVEMENT (1995–PRESENT)

Initiated by Dr. Kalyan Singh Rawat, this movement encourages newlywed couples to plant a tree at the bride's parental home, promoting forestation through social customs. The Maiti Movement is a unique and eco-friendly initiative started in 1995 by Dr. Kalyan Singh Rawat, a teacher and environmentalist in the Chamoli district of Uttarakhand. The word "Maiti" comes from the local tradition, meaning a woman's parental home. The movement beautifully blends environmental conservation with social customs, especially marriage rituals.

As part of the movement, newlywed couples are encouraged to plant a tree at the bride's parental home before leaving for the groom's house. This symbolic act not only strengthens emotional bonds but also promotes a forestation and environmental awareness. Women play a central role in spreading and sustaining this movement, making it a community-driven effort.

Over the years, the Maiti Movement has gained widespread support in Uttarakhand and other states, turning thousands of weddings into opportunities for planting trees and protecting the environment. It showcases the powerful role of women in combining tradition with sustainability.

##### 3. WATER CONSERVATION EFFORTS

Women have actively participated in protecting natural water sources like springs and streams, ensuring clean water availability in remote areas.

##### 4. SUSTAINABLE AGRICULTURE

Many women practice organic farming, use traditional seeds, and promote eco-friendly techniques that protect soil health and biodiversity.

##### 5. A FORESTATION AND REFORESTATION

Women-led groups and self-help groups (SHGs) regularly organize tree plantation drives and protect community forests from illegal exploitation.

##### 6. ANTI-MINING AND ANTI-DAM PROTESTS

Women have stood against environmentally harmful projects like large dams and limestone mining that threaten local ecosystems.

These initiatives reflect the leadership and commitment of Uttarakhand's women in preserving nature, blending traditional wisdom with modern awareness to protect the environment for future generations.

#### IV. MOUNTAIN WOMEN AS A RESERVOIR OF TRADITIONAL WISDOM

Women in the mountainous regions of Uttarakhand are the custodians of traditional ecological knowledge, playing a vital role in the sustainable management of natural resources. As primary caregivers and subsistence farmers, they possess deep understanding of land, water, forests, and biodiversity.

They have developed and preserved indigenous agricultural practices, such as traditional seed storage methods using natural containers like *tumri*, *bhakars*, and *ringal* baskets. These seeds are treated with ash, oil, walnut leaves, or cow dung to prevent pests, showcasing their expertise in organic pest control. Women also maintain seed exchange systems within their communities, fulfilling up to 80–90% of seed needs through local networks.

Women are central to forest and water resource management, responsible for gathering fodder, firewood, and medicinal plants. They contribute to reviving traditional water sources like *naulas* and *dharas* by planting broad-leaved trees that enhance groundwater recharge. Their reverence for nature is reflected in cultural practices such as protecting sacred groves, which act as biodiversity reservoirs.

Known as “Herbalists”, rural women hold vital knowledge of medicinal plants, often serving as the only healthcare providers in remote areas. This is crucial in places lacking access to modern medicine, with up to 65% of India's population relying on traditional remedies.

In summary, the women of Uttarakhand are not only resource managers and farmers but also guardians of biodiversity, traditional medicine, and ecological balance, making them invaluable to sustainable development in the region.

#### V. WOMEN ENTREPRENEURS IN UTTARAKHAND'S MSME SECTOR

In Uttarakhand, women actively participate in group-based industrial activities such as manufacturing, assembly work, manual labor, and repair and service enterprises. A woman entrepreneur is defined as an individual or a group of women who initiate, plan, and manage a business venture. These entrepreneurs play a crucial role in creating, adapting, and expanding various economic activities across the state.

Women in Uttarakhand are increasingly becoming drivers of sustainable development, contributing not only to agriculture and horticulture but also to small-scale and cottage industries. Their entrepreneurial efforts are essential in generating new employment opportunities and enhancing economic growth. As a result, entrepreneurship has become a vital pillar of economic success and a growing source of global inspiration.

Despite their growing involvement, women's participation in entrepreneurial activities remains a relatively recent phenomenon. Addressing the root causes of economic inequality and empowering women through inclusive development policies is essential for balanced progress.

The Government of India has taken significant steps to promote entrepreneurship through initiatives like Skill India, Make in India, and Start-up India. These programs aim to create an enabling environment for aspiring entrepreneurs, including women.

#### INSTITUTIONAL SUPPORT FOR WOMEN ENTREPRENEURS

Women aspiring to start businesses in areas such as spinning, weaving, and embroidery can access development and financial support from national institutions like the Small Industries Development Bank of India (SIDBI). SIDBI plays a crucial role in advancing gender equality and entrepreneurship by providing microcredit and supporting programs tailored for women-owned enterprises.

The Small Industries Development Organization (SIDO) also contributes significantly by promoting skill-based entrepreneurial ventures. These include training and support for circuit board manufacturing, leather goods production, screen printing, and TV

repairs, helping women diversify into non-traditional industrial sectors.

To further strengthen this ecosystem, the Federation of Indian Women Entrepreneurs (FIWE) was established in 1993. It functions as a voluntary network comprising NGOs, self-help groups (SHGs), and individual women-led enterprises. FIWE offers essential guidance in areas such as technology, market access, and international trade, empowering women to compete on both national and global platforms.

Other key organizations providing critical support include:

- National Bank for Agriculture and Rural Development (NABARD)
- Self Employed Women's Association (SEWA)
- Indian Chambers of Commerce and Industry Women's Association

These institutions collectively work to bridge the gap in women's representation in the economic sector—a matter that continues to draw attention from both academics and policymakers.

## VI. REGIONAL CONTEXT: UTTARAKHAND

Uttarakhand, a North Indian state established in November 2000, comprises 13 districts and two culturally rich regions: Garhwal and Kumaun. Each region holds distinct traditions and social structures. This diverse landscape offers unique opportunities and challenges for women entrepreneurs. Targeted support and locally adapted policies are essential to unlocking the entrepreneurial potential of women across these varied settings.

### GOVERNMENT POLICIES FOR WOMEN EMPOWERMENT AND INDUSTRIAL DEVELOPMENT IN UTTARAKHAND

The Department of Women Empowerment and Child Welfare serves as the primary body at the state level responsible for formulating and implementing schemes aimed at the empowerment of women. In collaboration with various government departments and NGOs, the Government of Uttarakhand is actively running several programs to support, motivate, and empower women across the state.

Recognizing the need for inclusive industrial development, the Governor of Uttarakhand has mandated the implementation of a special Integrated Industrial Promotion Policy specifically tailored for the hilly and remote regions of the state. This policy is designed to promote women empowerment and economic development by fostering organized industrial growth and creating employment opportunities in underserved areas.

Key objectives of the policy include:

- Establishing entrepreneurial manufacturing facilities
- Expanding infrastructure in remote regions
- Enhancing market access for local producers
- Providing financial assistance to aspiring entrepreneurs

This comprehensive approach aims to reverse economic backwardness in hilly regions by reducing brain drain—the migration of educated and skilled individuals due to lack of local opportunities.

Despite the challenges posed by difficult terrain, limited infrastructure, and social barriers, such policies are focused on planned and synchronized industrial development. They encourage the use of local capital, promote sector-specific entrepreneurship in processing, distribution, and service industries, and work to define realistic development limits and opportunities.

Uttarakhand, often referred to as *Devbhumi* (Land of the Gods), faces unique environmental challenges due to its fragile Himalayan ecosystem. To address these, the state government has launched several pioneering initiatives focusing on water security, air quality, and biodiversity.

### 1. WATER CONSERVATION & RIVER OVERHAULING

The drying up of traditional springs, streams, and natural water sources due to water scarcity is becoming a major cause for concern in the mountains.

- SARRA 2023 (Spring and River Rejuvenation Authority): Established as a nodal agency to scientifically restore the hydrological health of the state. It follows the "One District, One River"

principle, where each district creates a watershed-based action plan for a specific river.

- Direct Injection Water Source Recharge Scheme: This project uses technology to inject treated rainwater into inactive hand pumps to recharge groundwater, starting with the Gairsain and Chaukhutia blocks.
- Bhagirath App: A community-driven mobile application launched in to help citizens identify and map local water sources for revival.

## 2. AIR QUALITY & "GREEN" INFRASTRUCTURE

The government introduced:

- Green Cess: A historic tax levied on vehicles entering from other states. The revenue (estimated at ₹100 crore annually) is earmarked for air pollution control, expanding green zones, and smart traffic management.
- Ropeway Projects (Parvatmala): To reduce vehicular emissions and environmental degradation caused by heavy mountain traffic, the state is aggressively developing eco-friendly ropeways (e.g., Sonprayag to Kedarnath and Govindghat to Hemkund Sahib).

## 3. BIODIVERSITY & FOREST PROTECTION

With nearly 71% of its area under forest cover, Uttarakhand has launched specialized programs to protect its natural heritage:

- Endangered Plant Conservation Program: Launched in July 2025, this is India's first systematic effort to revive 14 critically endangered plant species (like the *Himalayan Gentian* and *Kumaon Fan Palm*) through scientific propagation in high-altitude nurseries.
- CAMPA (Compensatory Afforestation Fund): Fund was approved for activities including the conservation of Bugyals (alpine meadows), removal of invasive species, and managing human-wildlife conflict using drones and camera traps.
- Harela Festival: Celebrated every July, this traditional festival has been institutionalized into a massive state-wide plantation drive led by the Chief Minister and local communities.

## 4. CLIMATE-RESPONSIVE AGRICULTURE

The Uttarakhand Climate Responsive Rain-Fed Farming Project (UCRRFP), focuses on making hill farming resilient to erratic rainfall.

- Polyhouse Scheme: to build climate-controlled polyhouses for farmers.
- Aroma Valleys: Development of six "Aroma Valleys" to promote the cultivation of high-value, climate-resilient aromatic crops over traditional water-intensive crops.

## SUGGESTION:

While the government has several large-scale programs, environmental conservation in Uttarakhand thrives best through a combination of community action, sustainable tourism, and ecological restoration.

Here are targeted suggestions for different stakeholders to help preserve the state's unique Himalayan ecosystem.

### 1. FOR TRAVELERS (ECO-TOURISM & RESPONSIBLE TRAVEL)

Tourism is a major economic driver but also a primary source of environmental stress.

- Adhere to "Leave No Trace": Carry back all non-biodegradable waste (plastic bottles, wrappers) from treks and high-altitude meadows (*Bugyals*).
- Choose Home stays Over Hotels: Opt for locally-run home stays instead of large resorts. This reduces the carbon footprint and ensures tourism revenue directly benefits the mountain communities who guard the forests.
- Respect Water Sources: Avoid using chemical soaps or detergents in or near natural springs (*dharas*) and glacial rivers.
- Travel During Off-Peak Seasons: To reduce the "carrying capacity" strain on fragile towns like Joshimath or Mussoorie, consider visiting during shoulder seasons.

### 2. FOR LOCAL COMMUNITIES (TRADITIONAL WISDOM)

The success of movements like *Chipko* proves that local residents are the best stewards of the land.

- Revive "Van Panchayats": Strengthen these traditional village forest councils to manage local woods, specifically focusing on planting broad-

leaved trees (like Oak) instead of highly flammable Pine, which dries out the soil.

- Protect "Chal-Khals": Encourage the digging of small percolation pits (*Chal-Khals*) on slopes to catch rainwater, which recharges local springs and prevents forest fires.
- Paryavaran Sakhis: Expand the "Paryavaran Sakhi" (Friends of Environment) model, where women's collectives manage village-level waste segregation and upcycling, turning waste into a livelihood.

### 3. FOR URBAN DWELLERS (SUSTAINABLE LIVING)

Cities like Dehradun and Haldwani are expanding rapidly.

- Mandatory Rainwater Harvesting: Implement rooftop rainwater harvesting to tackle the dropping groundwater levels in the Doon Valley.
- Native Landscaping: Replace ornamental garden plants with native Himalayan species that require less water and support local pollinators like the Himalayan honeybee.
- Urban Composting: Since mountain waste management is logistically difficult, decentralized composting of kitchen waste can significantly reduce the burden on landfills.

### 4. STRATEGIC/POLICY SUGGESTIONS

- Green Infrastructure: Prioritize Ropeways over massive road-widening projects in landslide-prone zones to minimize hill-cutting and tree felling.
- Climate-Smart Agriculture: Shift toward "Subhash Palekar Natural Farming" (SPNF) or organic millets (*Mandua*, *Jhangora*), which are drought-resistant and do not require chemical fertilizers that leach into the river systems.
- Payment for Ecosystem Services (PES): Suggesting a model where downstream states pay a "conservation bonus" to Uttarakhand for maintaining the forests that regulate the water flow for the entire North Indian plain.

## VII. CONCLUSION

This research has studied the unpaid economic activities of women in Uttarakhand and more efforts

should be made to recognize the role of hill women in the development of the state in various programs and to appreciate and improve their capabilities in addressing issues related to village ecosystem management. Women of Uttarakhand can be seen as an important link in socio-economic and environmental development, so there is a need to expand the government facilities available to them to enhance and cherish their capabilities, however, no kind of technological and economic improvement will be successful unless there is effective participation and active involvement of women in the formulation, implementation and evaluation of any agricultural development strategy. There are two important aspects of agricultural development strategy: first, appropriate agricultural technology should be identified and developed with the effective participation of women, then the phenomenon of environmental sustainability will come automatically. Second, it is important to provide institutional incentives to rural women and generate socio-political efficacy, besides, it is important to enhance the social security of these women by setting up processing industries and managing natural resources, cultivating medicinal plants, etc., which can increase employment opportunities for both men and women in this region. This can reduce the migration of men. If the women of Uttarakhand are given the status of farmers, they will get their rights over their respective lands, which will go a long way in empowering them and improving their status. Yet, amidst all these concerns, a Pahadi woman remains fully dedicated to her work, maintains her patience and is completely honest. Whether it is about environmental protection or water conservation, women in Uttarakhand have always made full efforts.

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