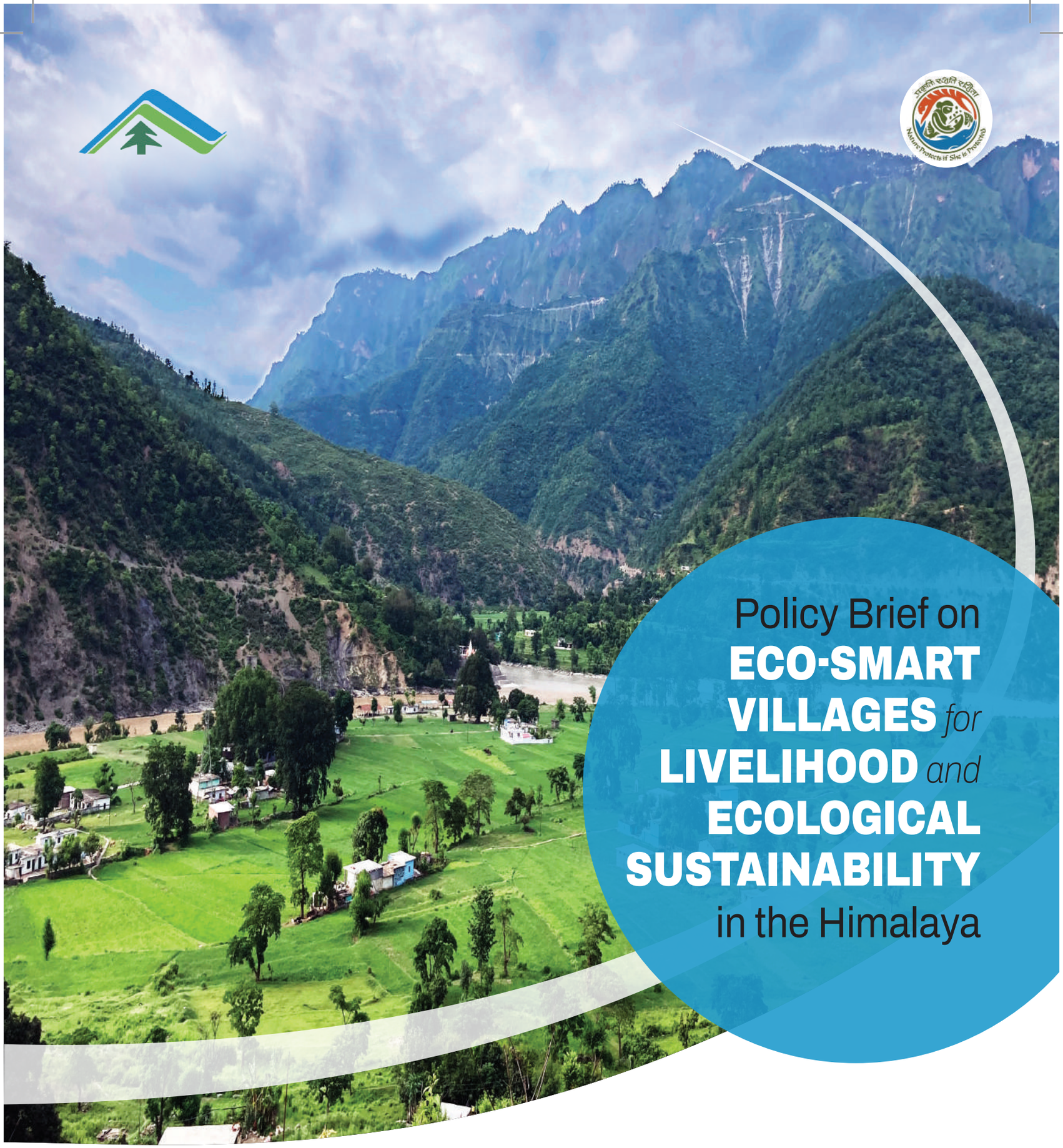

# Policy Brief on **ECO-SMART VILLAGES** *for* **LIVELIHOOD** *and* **ECOLOGICAL SUSTAINABILITY** in the Himalaya


**Centre for Socio-Economic Development (CSED)**

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# ABOUT THE CENTRE FOR SOCIO-ECONOMIC DEVELOPMENT

## VISION

- Advancing Scientific Knowledge (with a focus on Regional & National priories and International goals).
- Identify and strengthen the local knowledge and researches of regional relevance.
- Demonstration, dissemination & skill building

## CORE COMPETENCE

- Natural resource assessment and management
- Documentation of indigenous knowledge system
- Wasteland development and restoration
- Resource mapping for rural planning and management

## CENTRE'S CONTRIBUTION

- Generate and document mountain specific indigenous knowledge on natural resource management, community livelihood, socio-economic database and drivers of change.
- Strengthen sustainable livelihood through promotion of on-farm and off-farm activities.
- Demonstrate and disseminate specifically designed models and appropriate knowledge products
- Develop and strengthen entrepreneurial skills and self employment opportunities through capacity building
- Assure food, nutrition, health and education security for mountainous regions, opportunities and challenges.
- Technology demonstration for livelihood upgradation, natural resource management, sustainable habitats and energy etc.
- Promote responsible tourism.

# ECO-SMART MODEL VILLAGE

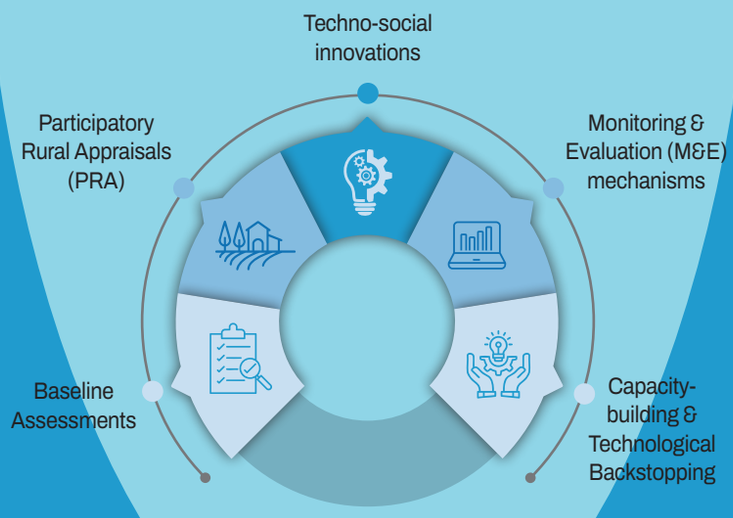
## Key Challenges in the Himalayas

- Fragile ecosystems and climate vulnerability
- Livelihood insecurity and outmigration
- Energy poverty and limited infrastructure
- Policy gaps and fragmented governance

## Key elements of Eco-Smart Village Model

- Community-led governance and participatory planning
- Ecological restoration and resource security
- Renewable energy and green infrastructure
- Livelihood diversification and market linkages
- Integration of traditional knowledge and innovation

## Methodological Approach



# LIVELIHOOD ENHANCEMENTS AND GOVERNANCE

## PROJECT OBJECTIVES

01 Identification of representative villages for community-led planning process for preparation of eco-smart model village plans across the IHR.

02 Preparation of baseline datasets and resource-use maps of the target villages through stakeholder's participation.

03 Capacity building of rural communities to implement "Eco-smart model village" plans for integrated natural resource management for livelihood improvement.

04 Demonstrate and develop 'Eco-smart model village' for enhancing livelihood, up scaling by Govt. Line Deptts. and foster ecological security in the region.

## MAJOR ACHIEVEMENTS

**VILLAGES COVERED:** 50

**HOUSEHOLDS BENEFITTED:** 2000 PLUS

**VILLAGE RESOURCE MAPS CREATED :** 20

**TECHNOLOGIES DISSEMINATED:** 15 PLUS

**CAPACITY AND SKILL BUILDING :** 4000 +

**AVERAGE RISE IN INCOME PER HOUSE HOLD :** 20-40% IN PILOT AREAS

KNOWLEDGE GENERATION: 100 PLUS RESEARCH PUBLICATIONS

POLICY INPUT AND REGIONAL PLANNING: CONTRIBUTED TO STATE RURAL LIVELIHOOD MISSION OF UTTARAKHAND, HIMACHAL PRADESH AND ARUNACHAL PRADESH

## LIVELIHOOD INITIATIVES UNDERTAKEN ACROSS THE IHR

**01**

**Promotion of NTFPs**
Supported the sustainable harvesting and marketing of non- timber forest products and medicinal plants.

**02**

**Eco-tourism and Homestays**
Developed eco- tourism and homestay facilities to generate income and promote cultural exchange.

**03**

**Skill Development**
Conducted training sessions for locals in various income- generating activities to enhance their skill set and job opportunities.

# KEY INTERVENTIONS

**Climate-smart Agriculture**

Off season cash crops production under **Poly house** technology to enhance productivity in sustainable manner.

**Water Management in farming**

Efficiently manage water resources, through **rain water harvesting and mulching** crucial for agriculture.

**Renewable Energy Solutions**

Introduced renewable energy options like **Pirul briquettes** (Pine needles converted to smokeless fuel) to reduce reliance on traditional, unsustainable energy sources.

**Waste management and sanitation**

Farm waste converted to **Vermi-compost, vermi wash** etc. and used for sale and soil fertility enhancement in the field.

**Value addition**

Post harvest processing of farm and forest produce like **Pickle, jam, mushroom, MAP** etc. for additional income generation.

**Green skill development**

**Poultry farming, fisheries, apiculture and handicrafts** (Aipan / Rakhi making) for food nutritional and livelihood enhancement.

**Eco-restoration and Afforestation**

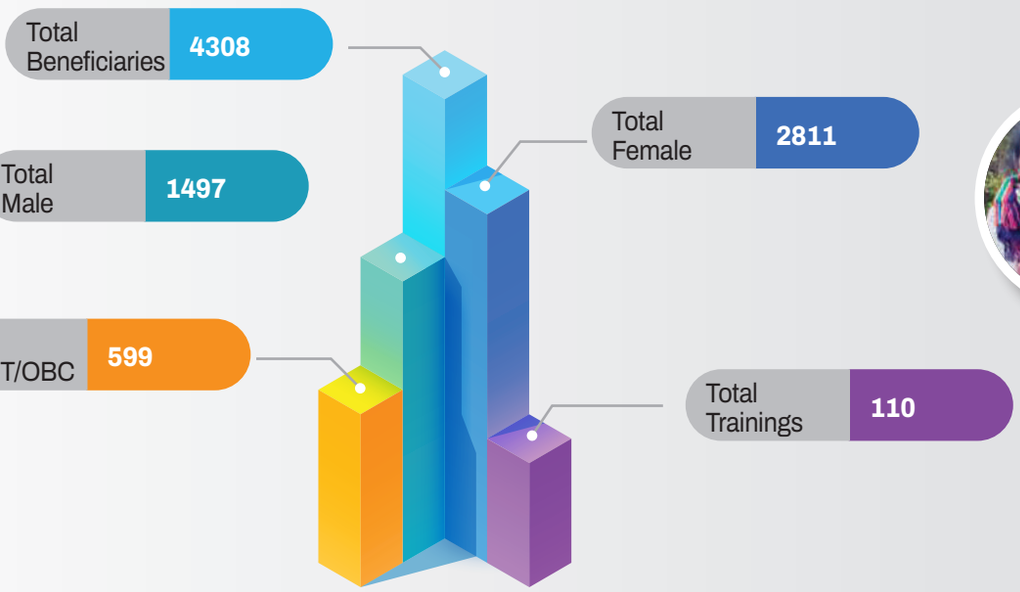
Rehabilitation of degraded land and promotion of **horticulture, NTFP's and fodder fuel wood** etc. trees to enhance the local ecosystem and livelihoods.

- Bee keeping **(28)***
- Poultry farming **(85)**
- Pine Check dams **(10)**
- Vermi-composting **(75)**
- Bio-briquette making **(25)**
- Mushroom cultivation **(200)**
- Green skills: Rakhi, Aipan **(19)**
- Roof top rainwater harvesting **(02)**
- Rehabilitation of degraded land **(~5ha)**
- Value addition : Jam, Jelly, Biscuit **(250)**
- Protected cultivation vegetable, fruits **(75)**

*** Value in parentheses indicate house hold at Jyoli eco-smart village.**


- 2450 households adopted
- Income augmentation 20-40 %

## Training/capacity building to " partners in change" across Eco-smart village clusters in IHR



## Input, Output, Outcome and Impact of rural technologies used for capacity building and natural resource management in eco-smart village clusters across IHR

| Intervention/ technology | Input (labour by stakeholders is common to all inputs*) | Output | Outcome | Impact |
|---|---|---|---|---|
| Protected cultivation | Bamboo frames, poly-thylene sheets, labour | • Polyhouse, polytunnel<br>• Poly-mulched soil | • More diversity of crops, and vegetables, vegetable yield throughout the year,<br>• Increase in vegetable yield due to less loss incurred due to wild life, pests, natural calamities<br>• Money saved for not having to purchase from market<br>• Surplus sold in market | • More yield per unit<br>• Better quality yield<br>• Better nutrition and health<br>• Decrease in women drudgery |
| Vermicompost | Vermi worm seeds, agriculture and household waste, pit or chamber, shade | Vermi compost pit or bed | • Higher yield<br>• Organic produce<br>• Improved soil fertility<br>• Money saved from not having to buy inorganic fertilizer | • Green circular economy<br>• Proper utilization of household and agricultural waste<br>• Higher yield<br>• Income generated through sale of surplus crops, vegetables<br>• Sale of surplus vermicompost |
| Bee keeping | Wooden bee hives/boxes, bee population for colonization | Honey Beeswax, Other products | • Better crop pollination in vicinity therefore higher yield,<br>• Environment friendly | • Income generation<br>• Health and nutrition<br>• Over all well being |
| Biobriquetting | Dried fallen Pine needles, Custom made Stove, custom made frame for biobriquettes, anaerobic chamber for burning needles | Biobriquettes, bioglobules, ash as fertilizer In protected cultivation | • Reduced forest fire,<br>• Reduce soil acidification,<br>• Less consumption of LPG gas,<br>• Surplus sold in market<br>• Energy requirement met for house hold cooking and heating in winter | • Reduce women drudgery for fuel wood collection,<br>• Save money for fuel purchasing for heating and cooking<br>• Reduce carbon emission |

| | | | | |
|---|---|---|---|---|
| Poultry farming | Chicken<br>Eggs,<br>House for chicken<br>Food for chicken | Chicken<br>Eggs | • Income generated<br>• Chicken droppings used as fertilizer in vegetable cultivation and fish food in some instances where pisciculture was also integrated<br>• Money saved from not having to purchase chicken and eggs from market | • Income generated from sale of eggs and chicken,<br>• Good nutrition and health |
| Green skilling | Pine needle both fresh and dried Pine bark, natural colours other stationary like threads, needle, glue, beads etc | Rakhi and Aipan, other decorative items like flower vase, pen stand, toys, tea coasters, wall hangings etc | • Reduce forest fire<br>• Reduce soil acidification,<br>• Waste to wealth generation<br>• Aesthetic products for sale | • Income generation<br>• Environment friendly,<br>• Boost to handicraft industry<br>• Promoting local art and culture. |
| Horticultural plantation/ Multipurpose tree plantations. | Saplings/seedlings of Kiwi, walnut, strwaberry, cardamom, dragon fruit, tezpatta, mulberry, walnut and apple etc. | Improve soil fertility<br>Reduce land degradation,<br>Exotic fresh hortiproducts for sale,<br>Value added products for sale. | • Combat land degradation, natural resource management, climate change mitigation, exotic hortiproducts for consumption and sale,<br>• Value added products for sale and consumption | • Good health and well being, better ecosystem services,<br>• more carbon sequestration, Income generation, reduction in waste degraded land. |

## Glimpse of project activities

## IMPACT STORIES / CASE STUDIES


## Executive Summary

- Eco-smart villages integrate community-driven approaches with sustainable technologies to improve livelihoods, ecological security, and climate resilience in the Himalayas. They represent a transformative model aligned with India's SDGs and climate goals.

## Policy Recommendations

1. Mainstream eco-smart villages in rural development policies
2. Establish dedicated financing mechanisms and green funds
3. Strengthen local institutions and capacity building
4. Promote digital platforms, ICT, and blockchain for transparency
5. Encourage cross-state and regional cooperation
6. Develop climate adaptation and disaster risk reduction frameworks

## The Road Ahead

- Eco-smart villages can serve as nuclei for sustainable mountain development, linking local livelihoods with national climate strategies and global SDGs. Scaling requires integrated policies, financing, and community empowerment.

## The Team

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