





# **DOUBLING FARMERS' INCOME IN A VILLAGE CLUSTER OF UTTARAKHAND**

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“Community driven eco-smart model village development to improve livelihoods and foster ecological security in the Himalaya”



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*THIS BOOK IS DEDICATED TO THE PEOPLE OF JYOLI VILLAGE CLUSTER*

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अजय टम्टा

संसद सदस्य (लोक सभा)  
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पूर्व राज्य मंत्री भारत सरकार



सदस्य

- पेट्रोलियम और प्राकृतिक गैस स्थाई समिति
- अनुसूचित जाति और जनजाति कल्याण स्थाई समिति
- सड़क परिवहन, राजमार्ग और पोत परिवहन परामर्श दायी समिति
- अध्यक्ष भारतीय खाद्य निगम उत्तराखण्ड भारत सरकार

### संदेश

हिमालय क्षेत्र की अस्सी प्रतिशत से अधिक जनता ग्रामों में निवास करती है। हिमालयी क्षेत्र में पर्यावरण संगत ग्रामीण विकास की अवधारणा को मूर्त रूप देने हेतु विगत कई दशकों से नीति निर्माताओं, जन प्रतिनिधियों, पर्यावरणविदों, स्वयं सेवी संस्थाओं इत्यादि के द्वारा निरन्तर प्रयास किये जाते रहे हैं। पर्यावरण संगत विकास का तात्पर्य ऐसे विकास से है जिसमें मनुष्य की वर्तमान आवश्यकताओं की पूर्ति के साथ-साथ पर्यावरण सन्तुलन भी कायम रह सके।



भारतवर्ष में ग्रामीण विकास केन्द्र एवं राज्य सरकारों के क्रियाकलापों का मुख्य केन्द्र बिन्दु रहा है। वर्तमान में केन्द्र सरकार समाज के अन्तिम पायदान पर बैठे लोगों को विकास का लाभ सुनिश्चित करने हेतु राज्य सरकारों के सहयोग से "सबका साथ, सबका विकास, सबका विश्वास एवं सबका प्रयास" की भावना से ग्रामीण विकास के विभिन्न कार्यक्रमों को संचालित कर रही है। हमारे माननीय प्रधानमंत्री जी ने वर्ष 2022 तक कृषकों की आय दोगुनी करने के लक्ष्य को साकार करने हेतु समन्वित ग्रामीण विकास की रणनीति बनाकर प्रभावी कदम उठाये हैं।

मुझे प्रसन्नता है कि दिनांक 5 जुलाई 2020 को मेरे द्वारा शुभारम्भ किये गये "ज्योली आदर्श ग्राम समूह विकास माडल" परियोजना पर गो0ब0 पन्त राष्ट्रीय हिमालयी पर्यावरण संस्थान, कोसी-कटारमल, अल्मोड़ा के सामाजिक-आर्थिक विकास केन्द्र द्वारा उक्त ग्राम समूह की तीन ग्राम पंचायतों के चयनित कमजोर वर्ग के कृषकों, बी0पी0एल0, कोविड प्रभावित परिवारों एवं मुख्यतः ग्रामीण महिलाओं को संस्थान के शोध एवं विकास कार्यों से प्राप्त आय अर्जन एवं आजीविका वृद्धि के विभिन्न उपायों जैसे-पॉलीहाउस में सब्जी उत्पादन, मुर्गी पालन, मौन पालन द्वारा शहद उत्पादन, मत्स्य पालन, चीड़ के पत्तियों (पिरुल) से धूम्ररहित प्राकृतिक ईंधन, राखी एवं ऐंपण, बंजर भूमि सुधार, फलोद्यान विकास एवं अन्य हरित कौशल विकास इत्यादि के माध्यम से विगत दो वर्षों में कृषकों की आय लगभग दोगुनी करके भारत सरकार के उपरोक्त लक्ष्य की प्राप्ति की है।

मैं पर्वतीय कृषकों के सामाजिक-आर्थिक उत्थान हेतु संस्थान द्वारा किये गये इस कार्य हेतु संस्थान के निदेशक डॉ0 सुनील नौटियाल एवं सामाजिक-आर्थिक विकास केन्द्र के सम्पूर्ण वैज्ञानिकों/कर्मचारियों की टीम को बधाई देता हूँ एवं उनके द्वारा उत्तरोत्तर उत्कृष्ट जनोपयोगी शोध एवं विकास कार्य करने की कामना करता हूँ।

  
अजय टम्टा



# FOREWORD

The Himalayan mountains are characterized by fragility, inaccessibility and marginality, and regarded as among one of the most eco-sensitive regions to climate change impacts. The rural communities of this region until a few decades ago were practicing agri-sylvi-pastoral mode of livelihood. But owing to several anthropogenic and natural change drivers and degradation of the bio-physical resources of the fragile ecosystem the life support system has gradually turned towards a less productive and unsustainable rural ecosystem.

The tiny and marginal holdings over rugged terrain are being abandoned and cultivating them is no more viable both economically and ecologically. Crop raiding by wildlife, vagaries of climate change and other socio-economic drivers have compelled people to out-migrate and resort towards low-volume high-value cash crops. Further, the basic necessities of life supporting natural resources, such as water, forests, land etc. are getting deteriorated leading to a loss in ecosystem services. In such a situation infusion of S&T based livelihood supporting technologies hold a paramount importance. The 'NIHE' has been devising such R&D based technologies with an aim to uplift the socio-economic conditions of mountain people and better management and conservation of natural resources. The Centre for Socio-economic Development (CSED) is particularly devoted for the cause of improving the socio-economic condition of rural poor, particularly weaker section, BPL, COVID affected people, women etc.

The present booklet is an outcome of such an effort made by the team of CSED by adopting a typical Jyoli village cluster for model village development in Almora district of Uttarakhand in mid-2020. It is notable that "Citizens Science" approach has been followed in all the R&D activities wherein the beneficiary households are participating in baseline data generation, Gram Panchayat level micro-planning, implementation and sustenance of project activities, monitoring and evaluation of the outputs/outcomes of improved livelihood practices etc. The recent concepts of "circular economy", "climate resilience" and "dovetailing and synergy building" with other programmes/projects of Govt. Line agencies have also been taken into consideration by the CSED team. The concerted efforts of the CSED team have been able to realize the dream of Govt. in India to '**Double the Farmers' Income by 2022**'. The Jyoli village cluster is now serving as a demonstration and scaling up example for a range of stakeholders. I congratulate the CSED team led by Dr. G.C.S. Negi for bringing out this booklet containing the journey of "Transformative Change" in the life of beneficiary households in this village cluster. I am sure that this publication will be a useful document for farmers, village level workers, researchers and Govt. line agencies engaged in similar activities in the Himalayan mountains.



**Prof. (Dr.) Sunil Nautiyal**  
Director, 'NIHE'  
Kosi-Katarmal, Almora

“ईको-स्मार्ट आदर्श ग्राम समूह” ज्योली में पर्यावरण संस्थान, कोसी द्वारा किये गये परियोजना कार्य (अगस्त, 2020 - सितम्बर, 2022)



परियोजना कार्य	लाभार्थी परिवारों की संख्या (130)										
	ज्योली	खड़कूना	कनेली	बिसरा	कुन्याड़ी	दिलकोट	कुल परिवार	परियोजना क्रियान्वयन से पूर्व आय (₹)	परियोजना कार्य से कुल आय (₹)	कुल खर्च (₹)	शुद्ध लाभ (₹)
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मौन पालन	02	01	01	03	10	02	19	131000	81000	117000	-
पीरुल का कोयला	-	-	07	06	16	01	30	96100	5000	4800	200.00
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वर्षा जल एकत्रण मॉडल	-	-	-	-	-	01	01	-	-	21000	4740 ली० जल एकत्रण
<b>कुल योग</b>	<b>58</b>	<b>05</b>	<b>38</b>	<b>30</b>	<b>77</b>	<b>29</b>	<b>237</b>	<b>850700</b>	<b>976600</b>	<b>461220</b>	<b>667230.00</b>

विस्तृत जानकारी : डॉ० गिरिश नेगी, वैज्ञानिक सामाजिक आर्थिक विकास केन्द्र (मो० 9411105170)

नोट: उपरोक्त ग्राम समूह के मूलभूत आँकड़े कॉमन सर्विस सेंटर (CSC) से निर्धारित शुल्क देकर प्राप्त किये जा सकते हैं।

## PREFACE



In the Himalayan context sustainable rural development vis-à-vis environmental conservation has been always a challenge for policy makers, planners and R&D organizations. Several approaches were followed to achieve this goal over the years considering the Gram Panchayats as a planning unit. However, in the want of lack of understanding on the dynamics of natural and human resources, none of these approaches could achieve the desired results. In the context of mountain villages, understanding of these resources is particularly detrimental, where there is a vast diversity in the bio-physical and socio-economic resources and it's spatio-temporal dynamics. The concept of carrying capacity of natural resources has been advocated in few such approaches. Nonetheless, the dynamics of rural development has been a complex issue and one approach cannot succeed in another rural setting.

At the 'NIHE' our Apex Bodies have always been looking forward for adopting a village cluster by the Institute for "Model Village Development" by applying the R&D based package of practices brought about by the Institute over the years based on carrying capacity concept. As a follow-up we have taken up a village cluster, which represents typical characteristics of mountain environment. The baseline data/information was generated on various socio-economic and environmental parameters following the Unnat Bharat Abhiyan and Sansad Adarsh Gram Yojna guidelines. The IOOI (Input, Output, Outcome and Impact) concept was applied in all our R&D activities.

Our approach has been stakeholder-driven and participatory right from planning village development to execution of project activities, monitoring and after-care. Through a range of livelihood-supporting, income-generating and environment-friendly technologies we applied focusing on 90 households of weaker sections, BPL, COVID returnee, women etc. in two years' time (mid-2020 onwards) we were able to raise the baseline income of the 62 target households by two-times in September 2022, thus realising the dream of **"Doubling Farmer's Income by 2022"** of Govt. of India.

This booklet contains an account of various livelihood-promoting, income-generating and environment-friendly R&D activities carried out across six villages in the Jyoli village cluster, Hawalbagh block (District Almora, Uttarakhand). Efforts have been made to build synergy by dovetailing with other Govt. programmes.

Many people and Govt. officials supported our activities in various ways. The Apex Bodies of the Institute have always been encouraging in this endeavour. Authors wish to thank all of them. Authors welcome any observations and suggestions to further improve the activities of this five years' project to achieve the desirable outcome.

**Dr. G.C.S. Negi**  
– Lead Author–



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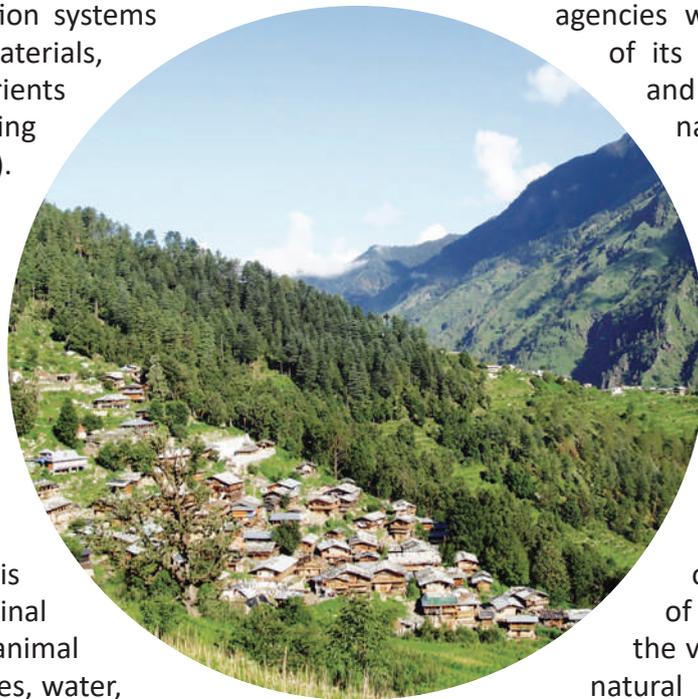
## INTRODUCTION

The Indian Himalayan region (IHR) is characterized by fragility, marginality, and inaccessibility that limits the land based livelihood options for the mountain inhabitants considerably (Anonymous, 1992). The small and rainfed holdings distributed over rugged terrain with minimal scope to practice market-oriented, modern input-intensive farming has limited people under subsistence economy, and their dependence continues on the forests and other natural resources for livelihood. Thus, inaccessibility, environmental heterogeneity, ecological fragility and marginality have favoured the evolution of subsistence farm production systems sustained with raw materials, organic matter and nutrients derived from the surrounding forests (Jodha et al. 1992). On an average, each unit of energy cultivated in the hill agro- ecosystems entails about 8-10 units of biomass energy from forests (Pandey and Singh, 1984; Ralhan et al. 1991).

The livelihood of rural people in the region is mostly dependent on marginal agriculture, horticulture, animal husbandry, forests, pastures, water, and various wild resources. The age-old survival skills and livelihood options of the mountain people have evolved through centuries in which the combination of crop-cultivation, animal husbandry and support from surrounding forests are utilized judiciously to secure livelihoods. However, over the years these natural resources are dwindling fast that has reduced the population supporting capacity of the mountain ecosystems (Singh & Singh, 1992). As a result, the youth migrate to the plains for better livelihood opportunities, and women form the backbone of hill agriculture and bear the brunt of carrying out almost all the household work like agricultural operations, fuel wood and fodder collection, animal husbandry, child care etc. Further,

in the want of adequate technology support and R&D back up to these custodians of the mountain ecosystem our natural resources are either misused, overused or underused, and these resources face the “Tragedy of Commons”. Also, the interest of local farming communities towards traditional crop cultivation is declining owing to factors of climate change, cultural and socio-economic transformation etc. (Pandey et al. 2017) that has led to the erosion of agri-diversity and food security (Maikhuri et al. 1997). The sectoral developmental activities are being undertaken by various development agencies with limited understanding of its ill-effects on sustainability and carrying capacity of natural resources that is deteriorating the ecological wealth of the region. Therefore, for sustainable development of the Himalayan region there is a need to undertake a holistic approach and integrated planning to improvise all relevant sectors simultaneously for addressing the issues of sustainable livelihoods of rural people considering the vast diversity in topography, natural and cultural landscape, micro-climate, water availability, etc.

At this juncture when development is constrained by resource depletion and environmental degradation in the IHR, the role of appropriate technologies and practices, which promote ecologically sound and sustainable development, particularly in the rural areas, becomes indispensable. A critical issue is also the extension and scaling up of technologies and practices for rural development. There is a need to speed-up and up-scaling of technologies that can be transferred to the rural areas in a manner that proves cost-effective and environment-friendly and easy to practice for their ready adoption (Maikhuri et al. 2011; Chauhan et al. 2021). Use of locally





available resources, both material and manpower, is pivotal for the success of such endeavours. Also, a treasure of traditional knowledge and wisdom available with the rural communities need to be utilized to manage their natural resources and environmental protection. Now, the policies and programs have realized the importance of appropriate technologies, which can play a key role in coping with uncertainties prevailing in the rural landscapes and therefore have stressed the need for on-site trainings and capacity building of user groups among the village communities (Pandey et al. 2017). Thus, an integrated, efficient and participatory approach for village development inclusive of all sections of society needs to be followed for driving the developmental process of the villages in this region. Mountain development has always been a matter of conflicting issues and ideas of several stakeholders (Sanwal, 1989). It has been pointed out that in discussing rural development in mountains, first of all particular constraints which arise from the geographic situation and the difficulties in building up the necessary infrastructure should be stressed (Lampe, 1983).

As elsewhere in the mountains, in the Western Himalayan state of Uttarakhand mountain

communities are facing a transformative change from their age-old agri-sylvi-pastoral mode of livelihood to a diversified livelihood support system in which environmental problems, topographic constraints, rampant outmigration, Government schemes, socio-economic condition of people, market forces etc. are playing a deciding role. Among the major environmental and socio-economic problems are: drying water sources, increased pests and wildlife attacks to crop as well as human beings, outmigration of youth in search of jobs and related developmental aspirations such as better education, health and recreation facilities. To cope with the situation a transformative change can be seen in the form of abandoning of croplands, reduction in crop varieties, weakened livestock husbandry, diversification of farming practices in the form of growing medicinal and aromatic plants (MAPs) / cash crops at a minor scale, and people resorting to other avenues of livelihood.

In the past few decades there has been a growing concern for deteriorating Himalayan mountain environment by various stakeholders and others across the globe. The processes, physical, anthropogenic, socio-economic and political have contributed to such concern and debate surrounded

by factors such as deforestation, landslide, floods, population growth in urban hamlets, poverty and malnutrition. To cope up the situation people are out migrating to urban areas and metropolitan cities in search of jobs and earn livelihood. Ives & Messerli (1989) has referred to it as the “Theory of Himalayan Environmental Degradation“. Escalating male out migration, land fragmentation and increasing risk of uncertain environmental conditions are deciding factors behind abandoning of croplands and agricultural transformation. As much as over 90% crop lands are abandoned and put to even non-agricultural land use in some of the populated and urbanised localities of this region (Negi & Joshi, 1996). Women participation in the mountain agriculture has thus become high (68%) as compared to the low land plains (36%) that calls for women-specific provisions in hill development (Bargali, 2015). Agriculture in the region has witnessed dynamic shifts and acute crisis over the last few decades. The social, economic and environmental condition for practicing agriculture is becoming increasingly delinked with agriculture leading to widespread de-agrarianisation and agricultural land abandonment (Tiwari & Joshi, 2015). The fragmented and scattered nature of land holdings has been identified as one of the main factors for decline in agricultural production in Uttarakhand (WMD, 2008). It has been emphasized that traditional cereal crop cultivation is uneconomic, and diversification in cropping system is necessary in the mountains. In such a situation cultivation of economically viable MAPs can improve socio-economy of farmers (Chauhan, 2010).

Further, significant natural and anthropogenic stressors that have destabilized the agriculture system, leading to the failing to meet household’s food demands (Farrington, 2000). Despite back-breaking work throughout the year, the farm produce hardly meets the food demand of people for 3-6 months of the year (Singh & Singh, 1992). The economy of the rural people of Uttarakhand hills is mainly dependent on subsistence agriculture and allied activities – cattle rearing, vegetable farming etc. and these activities are highly labour intensive. The poor sections of society are always the hardest hit in such a situation of food shortages, disaster or pandemic situation. Thus, with about 85 percent of Uttarakhand farm households being small and marginal, and a significant part of the population

being marginal farm labourers, welfare measures to contain any damage from pandemic such as COVID are definitely going to help them. For example, among a sample of 73 farmers in Uttarakhand (Bageshwar Distt.) only 11% liked continuing agriculture those belonging to APL category (Shukla et. al. 2008). The main reasons highlighted were a high risk of crop failure due to erratic rainfall, crop raiding by monkeys and wild boars, low income, migration and labour unavailability. These conditions have led to the strong inclination of farmers, irrespective of age and gender, to withdraw from agriculture thereby resorting to non-farming activities.

### **Sustainable village development concept**

In India almost 70% population still live in rural areas and almost 50% population still reside in the villages (Census, 2011). Govt. of India has employed several approaches of village development activities in livelihood, education, infrastructure, natural resource management, water, forests, health and sanitation, and various other sectors with a vision of New India by 2022 “Sabka Saath, Sabka Vikaas, Sabka Vishwas“. This vision consists of five





considerations: Indian economy has high rate of growth but major development challenges; pockets of under-development need rapid improvement; inclusive growth; sustaining 8% or higher GDP growth; and meet SDG commitments (<https://www.livemint.com/politics/news/after-sabka-saath-sabka-vikas-win-sabka-vishwas>). Countrywide 117 Districts have been chosen on the basis of poverty, poor health, education and basic infrastructure deficit as “Aspirational Districts” for “Transformative Change”. Based on the developmental index the districts have been classified into: Front runners, Achievers, Performers and Aspirants. In Uttarakhand, among the “Aspirational Districts” Udham Singh Nagar and Haridwar are included (<https://niti.gov.in/about-aspirational-districts-programme>). Also, Saansad Adarsh Gram Yojana (SAGY) and Unnat Bharat Abhiyan of Ministry of Human Resource Development (Govt. of India) to uplift economic status of rural India are a notable efforts in this regard. A number of Central and State Government schemes are implemented across the Gram Panchayats of IHR states aiming at socio-economic development, poverty alleviation, food and water security, skill development and income generation by the Govt. of India (Annexure I). In this context the contribution of MGNREGA is particularly remarkable which addresses natural resource management focusing on water harvesting, irrigation facility, plantation, land development for livelihood support etc. particularly to those from the weaker sections of the society (SC/ST & BPL) and marginal and small farmers (with < 2 ha land) (<https://www.nrega.nic.in/>). The Uttarakhand Vision, 2030 document (Planning Deptt. Govt. of Uttarakhand, 2018) lays out the future roadmap based on the 17 SDGs and cover four sectors: Sustainable Livelihoods, Human Development, Social Development and Environmental Sustainability. Despite of all these efforts of village development still the process is largely top-down and undermines community involvement in planning process, which is further aggravated by limited capacity of village people for devising developmental plans, low access to modern technology and other socio-economic constraints that leads to limited success of such programmes (Report of the Task Force, 2010). Emphasis has been given to dovetail and synergize with the relevant line agencies to implement the village development plans to achieve economic and ecological security of this region.

### **Eco-smart model village concept**

Worldwide several initiatives are promoting or using the concept of the “Smart Villages”. They promote access to sustainable energy as a main catalyst for the development of good education and healthcare systems, access to clean water, sanitation, economic growth, enhanced security, gender equality, etc. The most important vision of the initiative is to apply more holistic and integrated approaches to enable the access to the energy in the rural contexts, while connecting/involving Governments, developmental and private sector in the process. The following definition of eco-smart villages has been adopted:

*“Smart Villages are communities in rural areas that use innovative solutions to improve their resilience, building on local strengths and opportunities. They rely on a participatory approach to develop and implement their strategy to improve their economic, social and/or environmental conditions, in particular by mobilizing solutions offered by digital technologies. Smart Villages benefit from cooperation and alliances with other communities and actors in rural and urban areas. The initiation and the implementation of Smart Village strategies may build on existing initiatives and can be funded by a variety of public and private sources.”*(<https://www.euromontana.org/en/a-look-back-on-the-smart-eco-social-villages-pilot-initiative>).

**This booklet is aimed at to present a comprehensive scenario of integration of physical, biological and human resources of a typical village cluster in Uttarakhand, which was taken up by the Centre for Socio-economic Development (CSED), ‘NIHE’, Kosi-Katarmal, Almora in mid- 2020 for “Doubling Farmer’s Income by 2022” under an institutional project “Community driven eco-smart model village development to improve livelihoods and foster ecological security in the Himalaya”. The main body of the text contains description of socio-economic and ecological impacts following implementation of a few environment-friendly, livelihood-promoting and employment and income generating R&D based interventions in Jyoil village cluster through people’s participation in district Almora in Uttarakhand.**

## DESCRIPTION OF JYOLI VILLAGE CLUSTER

### Physical setting

Jyoli village cluster located between 29°36'38" and 29°38'13"N latitude and 79°34'40" and 79°36'35"E longitude in Hawalbagh Developmental Block in Almora Distt. Uttarakhand (Fig.1) was selected in June 2020 to implement some livelihood supporting and income generating activities among the selected households to achieve the Govt. of India vision of "Doubling the Farmer's Income by 2022", and bring about a "Transformative Change" in the life of village people. This area falls in lesser Himalayan belt and has a monsoonal cool and temperate climate having moderate rainfall. The total area of the village cluster is about 5.29 km<sup>2</sup>, and the altitude varies between 1268 m and 1550 m amsl, with undulating terrain dissected by many small seasonal streams. This village cluster represents typical characteristics of mountain villages in terms of marginal holdings over rugged terrain, rainfed agriculture with low yield, poor quality livestock, abandoned croplands, increasing wastelands, drying water sources and degrading forests etc.

In the study area the coolest month is January, with an average temperature of 13.3 °C and average annual rainfall of 1,132.5 mm. The month with the most precipitation is August with 330.3 mm rainfall, and least precipitation in November with 4.6 mm rainfall. There is an average of 46.8 days of precipitation, with the most precipitation occurring in August with 11.9 days and the least precipitation occurring in November with 0.6 days (Joshi et al. 2014). Soil in the region is characterised by moderately shallow to deep in depth with granular soil structure while sub-surface layers develop sub-angular blocky structure as a result of increasing clay content and soil compaction. The texture varies from loamy sand to silty clay. The soils are acidic in nature and with pH ranging from strongly acidic to neutral (5.1-6.6). The acidic nature of soils is due to leaching of bases during heavy rains (Mhalla et al. 2019).

### Demographic profile

In this village cluster of three Gram Panchayats, six villages namely, Jyoli-Khadkuna, Kaneli-Bisra and

Kujyari-Dilkote are situated. Total population of the village cluster is 1752 (male=906, female=846, M:F=0.93) distributed within 303 households (Primary Survey, 2020) (Table 1). The SC population is about 28%, and about half of the households fall under BPL category. Two villages, namely Khadkuna and Bisra do not have any SC households. About one-third population of the village cluster is out migrated. Baseline income (June 2020) of the village cluster from farm based activities including animal husbandry ranges from Rs. 600 to Rs. 30000/HH/year with a mean value of Rs. 5243/HH per year. Total MGNREGA card holders in the village cluster are 274. The mean literacy rate of the village cluster is 88.8%, which is well comparable to District Almora and Uttarakhand State.

### Land use

This village cluster is spread over 529 ha area, out of which 67 ha is under forests and a large area (122.1 ha) is under permanent pasture and grazing land (Table 2). Area under cultivation is 213.5 ha and about half of it is culturable waste land. As per our household survey in mid-2020 the land under cultivation is only 17.9 ha, abandoned land is 18.5 ha and cultivated waste land is 12.5 ha (Table 3) leaving about 97% of the cultivated land unutilized and prone to invasion of weeds and land degradation. Thus, it may be pointed out that the real scenario of agriculture is far removed than the reality what the Govt. records show in terms of net area sown and crop yield at the block and district level.



**Table 1: Demographic profile of the village cluster (Source: Primary Survey 2020)**

Village	No. of HH	Population			Caste status		Income status		Migrated population (%)	Baseline income from farming system (Rs./HH/yr)	Literacy rate (%)	MGNREGA card holders
		Male	Female	Total	SC	Gen	BPL	APL				
Jyoli	113	285	303	636	241	395	41	72	26	6056	84.7	41
Khadkuna	18	50	48	116	0	116	03	15	38	3222	98.3	06
Kaneli	51	108	128	267	156	111	23	28	24	7069	93.6	81
Bisra	39	99	110	209	0	209	19	20	19	3695	95.2	39
Kujyari	69	234	236	429	63	366	48	21	25	9416	85.8	94
Dilkote	13	52	47	95	36	59	07	06	52	2000	90.5	13
<b>Total</b>	<b>303</b>	<b>906</b>	<b>846</b>	<b>1752</b>	<b>496</b>	<b>1256</b>	<b>141</b>	<b>162</b>	<b>31</b>	<b>5243</b>	<b>88.8</b>	<b>274</b>

**Table 2: Land use of Jyoli village cluster (area in ha) (Census Records, 2011)**

Village	Total area of village	Forest	Area under non agriculture use	Barren & un cultivated land	Permanent pastures and other grazing lands	Culturable waste land	Current fallow	Net sown area
Jyoli	212.8	0	1.8	0	84.7	46.8	0	79.4
Khadkuna	32.7	12.2	5.1	0.9	4.2	0	0.2	10.1
Kaneli	68.3	12.9	0.2	0	4.7	9	0	41.4
Bisara	45.8	0	0.5	0	1	28.2	0	16.1
Dilkot	38.1	0	3.6	0	0	9.9	0	24.6
Kujyari	131.3	41.9	18	0	27.5	2.1	0	41.9
<b>Total</b>	<b>529.0</b>	<b>67.0</b>	<b>29.2</b>	<b>0.9</b>	<b>122.1</b>	<b>96.0</b>	<b>0.2</b>	<b>213.5</b>

**Table 3: Land use pattern of the village cluster (Source: Primary Survey, 2020)**

Village	Irrigated land (Ha)	Rainfed land (Ha)	Abandon land (Ha)	Cultivable waste (Ha)
Jyoli	0.08	8.1	3.98	5.48
Khadkuna	-	0.89	2.03	0.04
Kaneli	0.1	2.04	1.58	1.32
Bisra	-	2.12	5.3	2.42
Kujyari	0.07	4.34	3.95	2.69
Dilkote	0.04	0.15	1.66	0.5
<b>Total</b>	<b>0.29</b>	<b>17.64</b>	<b>18.5</b>	<b>12.45</b>

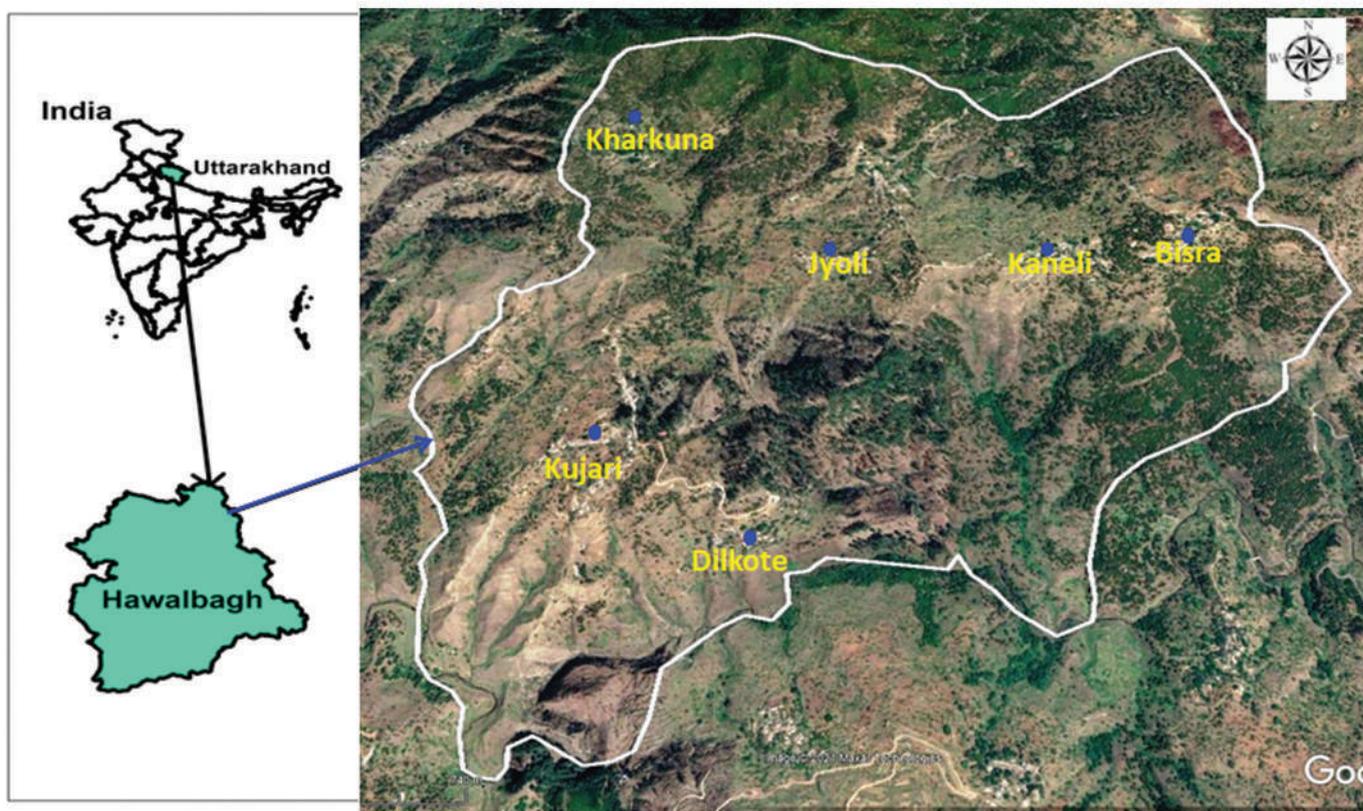


Fig. 1: Location map of the Jyoli village cluster

In this village cluster there are 21 water sources those are utilised by people for drinking and other household use. The per day water consumption of the village cluster ranges between 2960 litres for Khadkuna village to 17685 litres for Kujyari village. Total water consumption of the village cluster is 51170 litres per day (Table 4). The fuel

wood consumption is lowest in Khadkuna village (164 Kg/day) and highest in Jyoli village (2211 Kg/day). The total fuel wood consumption of the village cluster is 4163 Kg/day. The use of LPG is prevalent in the village cluster with 85% users of LPG, and all the HH of the village cluster are electrified.

**Table 4: Resource use in the Jyoli village cluster**

Village	LPG (% HH)	Water consumption (litre/day)	Fuel wood consumption (Kg/day)
Jyoli	89	12735	2211
Khadkuna	100	2960	164
Kaneli	70	8330	509
Bisra	97	6225	347
Kujyari	93	17685	749
Dilkote	61	3235	183
<b>Total /mean</b>	<b>85</b>	<b>51170</b>	<b>4163</b>

(Source: Primary Survey, 2020)



### Farming system

In this village cluster four cereals and millets, six pulses, 12 vegetables, three species of spices and condiments are grown (Table 5), and yield of these crops as per our primary survey in 2020 is given in Table 6. Finger millet and pulses are the major crops grown as mixed crops in Kharif season (Rainy). The lowest acreage was found under Wheat and Barnyard millet (~3%). As mentioned earlier, due to the lack of water sources and irrigation facility the village people largely rely upon the rainy season for growing crops such as pulses and finger millet. During Rabi season (winter) the crop fields are almost abandoned due to menace of monkeys and low rain fall that is insufficient for germination of crops. Spices such as Turmeric (*Curcuma longa*), Ginger (*Zingiber officinale*) and Coriander (*Coriandrum sativum*) are also sown in these villages. On an average, crop yield was found 0.6 t/ha, which is just half as compared to the average yield of croplands of this region (1.2 t/

ha) (Rekha Rani & Singh, 2015). In the entire village cluster crops are grown in about 29 ha land within an annual cycle. Finger millet-mixed with pulses is the major cropping pattern occupying ~63% area followed by rice (~24% area) and wheat and pulses (~6% area each) (Table 6). The crop yield is dismally low and Finger millet was the only crop that has better yield (11 Q/ha) among all other crops. Of late people have left sowing the winter crops due to low seed germination and crop growth due to rain fed condition and damage by wildlife. However, sowing of Kharif season crops still continued by some HH as during rainy season irrigation is not required and wildlife damage is also reduced owing to availability of food in the surrounding forests. Among vegetables; Onion, Potato, Leafy vegetables and Climber vegetables are notably grown. Among the fruit tree species Lemon (*Citrus limon*), Plum (*Pyrus communis*), Pear (*Prunus persica*), Apricot (*Prunus domestica*) etc. were prominent.

**Table 5: List of crops sown in Jyoli village cluster**

Cereals and Pulses	Vegetables and Spices
Wheat ( <i>Triticum aestivum</i> L)	Potato ( <i>Solanum tuberosum</i> L)
Finger millet ( <i>Eleusine coracana</i> G)	Onion ( <i>Allium cepa</i> L)
Paddy ( <i>Oryza sativa</i> L)	Tomato ( <i>Solanum lycopersicum</i> L)
Barnyard millet ( <i>Echinochloa frumentacea</i> L)	Bottle gourd ( <i>Lagenaria siceraria</i> Standl)
Soybean ( <i>Glycine max</i> L)	Mustard ( <i>Brassica juncea</i> L)
Black gram ( <i>Vigna mungo</i> L)	Pumpkin ( <i>Cucurbita maxima</i> Duch)
Horse gram ( <i>Macrotyloma uniflorum</i> L)	Radish ( <i>Raphanus sativus</i> L)
Black soybean ( <i>Glycine max</i> L)	Pea ( <i>Pisum sativum</i> L)
Lentil ( <i>Lens culinaris</i> M)	Brinjal ( <i>Solanum melongena</i> L)
Amaranthus ( <i>Amaranthus cruentus</i> L)	Bitter gourd ( <i>Momordica charantia</i> L)
	Garlic ( <i>Allium sativum</i> L)
	Fenugreek ( <i>Trigonella foenum-graecum</i> L)
	Capsicum ( <i>Capsicum annuum</i> L)
	Coriander ( <i>Coriandrum sativum</i> L)
	Ginger ( <i>Zingiber officinalis</i> L)





**Table 6: Yield of different crops in Jyoli village cluster (values in parentheses are percent of the total yield) (Source: Primary survey, 2020)**

Village	Pulses		Wheat		Rice		Barnyard millet		Finger millet	
	Net sown area (ha)	Total yield (Q)	Net sown area (ha)	Total yield (Q)	Net sown area (ha)	Total yield (Q)	Net sown area (ha)	Total yield (Q)	Net sown area (ha)	Total yield (Q)
Jyoli	5.34	15.93	0.11	1.65	1.06	3.38	0.82	3.11	6.22	66.12
Khadkuna	0.46	2.82	0.02	0.05	0.09	0.36	0.18	0.31	0.62	3.45
Kaneli	3.02	10.58	0.04	0.4	0.12	0.60	0.2	0.86	1.72	11.80
Bisra	1.4	7.81	0.58	5.60	0.04	0.13	-	1.04	2.08	23.93
Kujyari	3.12	31.46	0.32	4.49	0.4	2.10	-	1.97	3.94	56.45
Dilkote	0.2	3.14	-	-	-	-	-	0.08	0.15	1.72
<b>Total</b>	<b>13.54</b>	<b>71.74 (27.5)</b>	<b>1.07</b>	<b>12.19 (4.7)</b>	<b>1.71</b>	<b>6.57 (2.5)</b>	<b>1.2</b>	<b>7.37 (2.8)</b>	<b>14.73</b>	<b>163.47 (62.6)</b>

### Livestock component

The total livestock population in Jyoli village cluster is 967, which consists of 220 cows, 120 ox, 117 buffalo, 310 goats, 190 calves and 10 horses (Table 7). Total fodder consumption by the livestock in the village cluster was estimated 1511 Kg/day of which about 61% was green fodder and rest (39%) was dry fodder. The total milk production of the village

cluster is about 692 liters per day, which is highest in Jyoli village and lowest in Bisra village. In the past this village cluster was famous for its dairy based products like cottage cheese, which has reduced now due to declining population of milch animals and milk yield. The dung production was estimated 3544 Kg/day, which ends up in the crop fields in the form of FYM to replenish the soil fertility.

**Table 7: Livestock resources of the Jyoli village cluster (Source: Primary Survey, 2020)**

Village	Cow	Ox	Buffalo	Goat	Calf	Horse	Total	Fodder consumption (Kg/day)			Milk Production (Lit/day)	Dung production (Kg/day)
								Total	Green fodder	Dry fodder		
Jyoli	88	34	35	166	78	07	408	124.5	51.0	73.5	225	1654
Khadkuna	22	03	04	-	20	-	49	215.0	145.0	70.0	28	163
Kaneli	45	44	41	62	30	03	225	288.0	228.0	60.0	204	594
Bisra	06	05	04	11	11	-	37	118.0	21.0	97.0	17	91
Kujyari	32	11	16	25	30	-	114	163.5	114.0	49.5	122	501
Dilkote	27	23	17	46	21	-	134	602.0	365.0	237.0	97	441
<b>Total</b>	<b>220</b>	<b>120</b>	<b>117</b>	<b>310</b>	<b>190</b>	<b>10</b>	<b>967</b>	<b>1511</b>	<b>924.0</b>	<b>587.0</b>	<b>692</b>	<b>3544</b>

### Wild edibles

Trees and shrubs growing in wild in the village cluster area are the important source of wild edibles those are eaten raw or cooked and supplement to the nourishment of the village people. Some of these species are utilized for delicious fruits, vegetables

and more importantly are precious sources of traditional healthcare system (Table 8). Wild fruits such as *Myrica esculenta* and *Rubus ellipticus* those ripen during summer are much cherished by the local people and also sold in the nearby towns, thus also earn some money for rural people.



**Table 8: Prominent wild edible flora in the Jyoli village cluster**

S. No.	Species name	Local name	Major use	Medicinal uses
1.	<i>Berberis asiatica</i> Roxb. ex DC.	Kilmora	Medicinal plant/ wild edible	Edible fruit, roots are used in treating ulcers, urethral discharges, ophthalmic ailments, jaundice, fevers etc.
2.	<i>Cinnamomum tamala</i> (Buch.-Ham.) T. Nees & Nees	Tejpatta	Medicinal plant/ condiment	Bark used in treatment of asthma and cough etc.
3.	<i>Dioscorea bulbifera</i> L.	Gaithi	Medicinal plant/ wild edible	Edible bulbs, used in treatment of piles, stomach ailments, diabetes, asthma etc.
4.	<i>Ficus palmata</i> Forssk.	Bedu	Medicinal plant/ wild edible	Edible fruit, used as demulcent and laxative etc.
5.	<i>Ficus roxburghii</i> Steud.	Timil	Medicinal plant/ wild edible /fodder species	Edible fruit, leaves are used in treatment of diarrhoea and dysentery
6.	<i>Myrica esculenta</i> Buch.-Ham. ex D. Don	Kafal	Medicinal plant/ wild edible	Edible fruit used in treatment of lung disorders
7.	<i>Prunus cerasoides</i> Buch.-Ham. ex D. Don	Padum	Medicinal plant/ wild edible /fodder species	Skin diseases, increasing the complexion and used as uterine tonic
8.	<i>Pyrus pashia</i> Buch.-Ham. ex D. Don	Mehal	Medicinal plant/ wild edible	Edible fruit used in treatment for eye infections
9.	<i>Pyracantha crenulata</i> (D. Don) M. Roem.	Ghingharu	Medicinal plant/wild edible	Edible fruit, used in treatment of myocardial weakness, paroxysmal tachycardia, hypertension, arteriosclerosis etc.
10.	<i>Rubus ellipticus</i> Sm	Hisalu	Wild edible	Edible fruit, root used in detoxification
11.	<i>Ziziphus jujuba</i> (L.) Lam.	Ber	Wild edible	Edible fruit
12.	<i>Zanthoxylum armatum</i> DC.	Timur	Medicinal plant/ wild edible	Seed anti-inflammatory, analgesic, antinociceptive, antioxidant and antibiotic

### Vegetation of the area and invasive weeds

As described above, the Jyoli village cluster is characterized by a sea of abandoned land that has been under cultivation in the past, community grazing lands of low grass cover and Pine (*Pinus roxburghii*) forests prone to forest fire that is held responsible for drying up of water sources. In this village cluster a total of 159 species of various trees (25), shrubs (46) and herbs (88) were found and 15 species of them were common to cropland, grazing lands and forests (Annexure II). The prominent forest trees (e.g., *Ficus palmata*, *Ficus roxburghii*, *Myrica esculenta*, *Prunus cerasoides*, *Pyrus pashia* etc.) and shrubs (e.g., *Berberis asiatica*, *Cinnamomum tamala*, *Pyracantha crenulata*, *Rubus ellipticus*, *Ziziphus jujuba*, *Zanthoxylum armatum* etc.) those are found in the village cluster are good sources of wild edibles, medicines and other multiple products. However, due to continued lopping of the tress and other vegetation wasteland is increasing in the study area. Such situation has led to the invasion of weeds such as *Lantana camara*, *Eupatorium* spp. *Parthenium*

spp. and have spread over approximately 4.0 ha area in the village cluster.

### Community forests

Community forests are integral part of mountain villages that provide fuelwood and fodder to the people for their subsistence living. There is a rich tradition of community forests in this region, which is a best example of conservation and sustainable utilization of common property resources (CPRs). In each of the six villages of Jyoli village cluster community forests exist. Community forests area varied from one village to another (Table 9) making about 13% area (66.5 ha) in the village cluster. Jyoli village has the oldest community forests (estb. 1984), and most of the VPs in these villages were established in 2004. Old dead and fallen trees for fuelwood and ground herbage for fodder, leaf litter for FYM preparation and occasionally some wood for agricultural implements, fencing poles and climber vegetables are utilized from these community forests. These forests are currently managed by the



Van Panchayats (an elected body of 9 members) in all these six villages. Most of the forest vegetation in these community forests is made up by Chir Pine (*Pinus roxburghii*). Chir Pine tree density in these VPs varies from 500 ind./ha (Bisra) to 5050 ind./ha

(Dilkote), with a mean tree density of 1890 ind./ha. Among the shrubs, the obnoxious weeds *Lantana camara* and *Eupatorium* spp. are prevalent. Some characteristics of the community forests are given in Table 9.

**Table 9: Details of community forests in Jyoli village cluster**

Name of the village	Area of community forest (ha)	Year of formation	Tree density (ind./ha)
Jyoli	16.20	1984	1450
Khadkuna	4.61	2004	1080
Kujyari	5.12	2004	1600
Dilkote	1.98	2004	5050
Bisra	25.6	1991	500
Kaneli	12.9	2004	1660
<b>Total / Mean</b>	<b>66.45</b>		<b>1890</b>

### Major fodder and fruit trees

Major fodder trees of the village cluster and their numbers present in each of the six villages are given in Table 10. Among these fodder trees Bhimal (*Grewia optiva*), Kharik (*Celtis australis*) and Oak (*Quercus leucotrichophora*) are most preferred as these species provide quality fodder during winter when the fodder resources in the nearby forests diminish. These trees are multipurpose in nature and provide 5Fs (fodder, fuelwood, fibre, fruit and fertilizer) to the village people (Negi, 1996). In this village cluster a total of 5128 fodder trees of various species yield about 66 t green leaf fodder annually. Total fuelwood consumption of the village cluster was computed as 875 t/yr (Table 11). In this village cluster 15 species of fruit trees are found among them Plum (*Prunus*

*domestica*), Apricot (*Prunus armeniaca*), Guava (*Psidium guajava*), Timil (*Ficus roxburghii*), Mango (*Mangifera indica*), Banana (*Musa paradisaica*), Walnut (*Juglans regia*), and Pomegranate (*Punica granatum*) etc. were prominent. Total yield of these fruit trees was computed 44 Q/yr. those earn Rs. 2100 for the village people by occasionally selling the surplus produce in the local market. Total wood stock in the forests of this village cluster was computed about 1077 ton, which is highest in Bisra forest (521 ton) due to its largest forest area, while the lowest in Kaneli forest (23 ton). The average fuel wood consumption computes to 1.96 Kg dry weight/capita/day, water consumption 30 lire/capita/day (LPCD) and livestock fodder consumption (stall fed) 1.7 Kg/capita/day.

**Table 10: Fodder trees in the Jyoli village cluster**

Fodder tree species	Jyoli	Khadkuna	Kaneli	Bisra	Kujyari	Dilkote	Total
<i>Grewia optiva</i>	535	109	83	104	134	23	988
<i>Celtis australis</i>	379	42	49	73	33	20	596
<i>Pyrus pashia</i>	639	85	232	54	671	114	1795
<i>Melia azedarach</i>	02	-	-	02	-	05	09
<i>Toona serrata</i>	34	-	-	04	-	02	40
<i>Quercus leucotrichophora</i>	18	04	-	04	-	-	26
<i>Prunus cerasoides</i>	658	112	129	58	649	68	1674
<b>Total</b>	<b>2265</b>	<b>352</b>	<b>493</b>	<b>299</b>	<b>1487</b>	<b>232</b>	<b>5128</b>

**Table 11: Consumption of fodder, fuelwood and fruit production in the village cluster**  
(values in parenthesis are the income generated by selling the fruits in Rs./yr.)

Village	Fodder trees	Fodder production (t/yr)	Fruit trees	Fruit production (Kg)	Fuel wood consumption (t/yr)
Jyoli	2265	23.1	244	1079	89
Khadkuna	352	3.2	93	470	66
Kaneli	493	3.9	86	765	205
Bisra	299	3.0	134	813 (1700)	140
Kujyari	1487	23.8	154	1116 (400)	301
Dilkote	232	8.6	16	151	74
<b>Total</b>	<b>5128</b>	<b>65.6</b>	<b>727</b>	<b>4394 (2100)</b>	<b>875</b>

### Prominent fauna

Major fauna present in the village cluster consists of Leopard (*Panthera pardus fusca*), Pine marten (*Martes flavigula*), Wild boar (*Sus scrofa*) and Porcupines (*Hystrix indica*), which causes significant damage to the livestock and crops (tuberous crops in particular). Other faunal diversity found in these villages includes different varieties of animals and birds (Table 12). However, population of these wild

animals is gradually declining and once commonly cited animals such as Pine marten and Porcupine are rarely seen now. In the recent years damage to crops by monkey and wild boar has compelled people to leave their crop-fields abandoned. The crop raiding by wildlife has become a detrimental factor behind apathy to agriculture and people are opting to migrate elsewhere in search of livelihood.

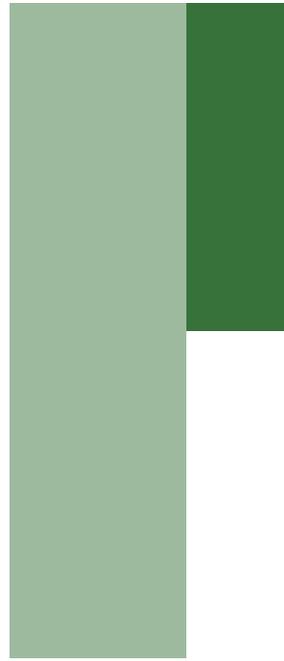
**Table 12: Prominent fauna in the Jyoli village cluster**

Species name	English name	Local name	Type
<i>Panthera pardus fusca</i> M.	Leopard	Taindua , Guldar	Carnivorous
<i>Martes flavigula</i> B.	Pine Marten	Chuthrol	Omnivorous
<i>Sus scrofa</i> Linnaeus	Wild Boar	Jangli Suvar	Omnivorous
<i>Macaca mullata</i> (Zimmermann)	Rhesus macaque/monkey	Bandar	Omnivorous
<i>Lepus nigricollis</i> Cu-vier	Wild Hare	Jangli khargosh	Herbivores
<i>Hystrix indica</i> Kerr	Porcupine	Saul, Solu	Herbivores
<i>Lophura leucomelanos</i> L.	Wild fowl	Kalij pheasant	Omnivorous
<i>Urocissa erythroryncha</i> B	Magpie	Lampuchdiya	Omnivorous
<i>Spilopelia chinensis</i> S.	Dove	Ghughut	Omnivorous
<i>Coturnix coturnix</i> L.	Quail	Bater, Chakor	Omnivorous
<i>Ortygornis pondicerianus</i> G.	Partridge	Titar	Omnivorous
<i>Passer domesticus</i> L.	Sparrow	Gauraiya	Omnivorous
<i>Corvus leucomelanos</i> L	Crow	Kawaa	Omnivorous

In this village cluster as evident by the socio-economic profile outmigration is rampant, crop fields are abandoned in the want of irrigation facilities and of late due to the wildlife (Monkey, Wild Boar and Porcupine) attacks, preponderance of Chir Pine forests that does not support a rich mix of vegetation having non-timber forest produce (NTFP) value, non-availability of work force that has out-migrated, etc. The poor fodder base and grazing lands invaded by weeds such as *Lantana camara*, *Partherium* sp., *Eupatorium* sp. etc. does not leave much scope for growth of quality grasses and avenues for animal husbandry. Despite these

challenges a few HH have been able to secure their livelihoods from this scarce and poor natural resources base. Traditionally people keep livestock to sell milk and collect some NTFPs (e.g., Ringal bamboo) and make baskets to sell them locally. Milk and milk-based products (cottage cheese) is also sold by the village people to secure their livelihood. On the whole, the village is struggling with low and deteriorating natural resource base vulnerable to climate change impacts and presents an ideal case to be taken up for S&T based development planning and action for sustainable livelihoods and human well-being.





## RESOURCE USE IN JYOLI VILLAGE CLUSTER

Estimation of natural resources and their use pattern is essential for micro-level planning at Gram Panchayat level. One of the major activity of our project was to build the capacity of village representatives for Gram Panchayat level planning based on the carrying capacity and sustainable development concept (VEAP, 2002). To determine the natural resources status of this village cluster we organised three training workshops involving Gram Pradhans, senior citizens, women and educated youth and information on various physical, biological and human resources were taken from the village records available with Gram Panchayats. Also, baseline household survey was conducted in 2020 using Unnat Bharat Abhiyan questionnaire with some modifications (Annexure III). To begin with resource-use pattern we compiled the household questionnaire information data and prepared a village cluster map with the help of Gram Pradhans and Ward Members, senior citizens, Change Leaders and experienced people of the cluster, in which detailed information was taken about all the natural, physical and human resources available in the villages and about their use-pattern and management. Training on use of GPS, RS&GIS data, ground truthing, toposheets and map reading for village bio-physical resources was given to the participants. The resource maps of three Gram Panchayats of Jyoli village cluster are given in Figs. 2-4. The village resource-use pattern was assessed as follows:

### Estimation of food resources

To estimate the food (cereals, pulses, milk etc.) resources of the village population, we have taken the standard norms of ICMR, i.e. 396 gm grain, 43 gm pulses as a source of protein and 500 ml of milk/capita/day. For example, the 636 population of Jyoli village would require 91,927 Kg food grain, 9,982 Kg pulses and 1,16,070 liter of milk annually. From the baseline survey we know that the availability of these

food items in this village. Thus the demand-supply gap in food supply was estimated for each of the six villages separately.

### Estimation of water resources

To assess the water consumption of the village people for drinking and domestic use, we multiplied the water demand of a person per day (40 LPCD as per WHO standards for rural areas) by the total population of the village. For example, the 636 people of village Jyoli would require  $40 \times 636 = 25,440$  L of water per day, which is met from various sources in the village through pipeline and water collected from the village springs. Whereas the availability of water in the village is 7673 liter per day from various water sources those exist in the village boundary. Thus, the village has a deficit of 17,767 (25,440-7,673) liter of drinking water per day. Taking the water consumption for one livestock unit 10 liter/day the Jyoli village would also require 3610 liter/day of water for 361 animal units.

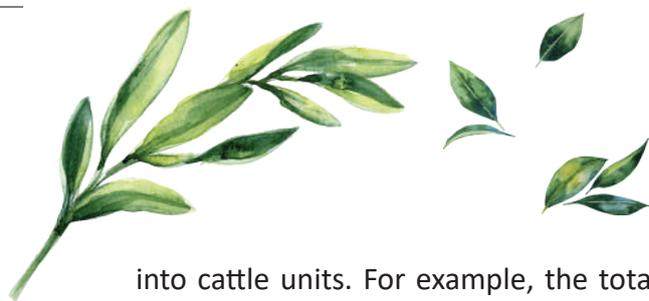
### Estimation of fuel wood and fodder resources

Based on the questionnaire survey conducted in the mid-2020 in the village cluster the fuelwood consumption was assessed. For example, in Jyoli village the total consumption of fuel wood per day was 2,211 Kg. Thus the annual consumption of fuel wood was estimated by multiplying the daily wood consumption by 365 days of the year ( $2,211 \times 365 = 8,07,015$  Kg). To meet the demand of the fuel wood, the village people are dependent on the nearby forests and trees growing in their community and private land. The total wood stock in each of the village was assessed (Misra, 1968) and the demand-supply gap of fuel wood was estimated.

### Estimation of fodder consumption by livestock

The fodder consumption in the village was estimated by the conversion of livestock population





into cattle units. For example, the total number of animals in village Jyoli is 408 inclusive of Cow (88) Calves (78), Buffalo (35), Ox (34), Horse (07) and Goat (166). To estimate their fodder consumption, we have converted them into animal units (1 Sheep= 1 animal unit; AU) and (1 Cow/Ox = 4 AU; 1 buffalo/horse= 6 AU; 1 Goat/calf = 1.5 AU). So the total AU in Jyoli village turned to 361 AU. One AU required 1 Kg of dry fodder or about 4 Kg of green fodder per day. Thus, the annual green fodder requirement of total 361 AUs of the village is  $361 \times 365 \times 4 = 5,27,060$  Kg. The total availability of fodder from various sources in this village is 15,267 Kg/yr, which shows that there is a significant deficit (97%) in the fodder availability in this village.

#### Resource use pattern in the Jyoli village cluster

Across the six villages on average the food grain deficit is 92% of the total annual demand of the people (Table 13). Similarly, the deficit of pulses was computed 75% as per the national standards of protein requirement per person per day (i.e., 43 gm). The milk deficit was computed 30% in the entire village cluster as per the ICMR norms. In some of the villages the milk yield was quite good and the deficit

was only 5-10% in Kaneli, Bisra and Kujyari villages. It is to be mentioned here that people of these villages make cottage cheese out of this milk and sell it in the nearby town Almora. This earns some income to meet their other emergent needs at the cost of their own reduction in milk consumption and health status. Large gap in supply and demand of fuelwood (deficit= 92%) and fodder (deficit= 97%) was also found in this village cluster that is met through use of LPG for cooking meals, fuelwood obtained from private trees, and the fodder deficit is met through open grazing by livestock in nearby forests. In this village cluster the deficit in water availability (74%) is met from the Govt. managed pipe lines those draw water from distant sources away from the boundary of this village cluster. The scenario of natural resources availability and consumption (i.e. supply and demand) is nonetheless almost same across all the six villages in the Jyoli village cluster.

In village Jyoli (Table 14), the food grain deficit is 92% and deficit of pulses is 84%, which shows that the supply of these resources from their farming system is very little (i.e. only 8-16%), and the demand is met from purchase from the local market. The deficit

**Table 13: Resource use pattern in Jyoli village cluster (values are based on average across all the six villages)**

Resources	Annual availability	Annual consumption	Surplus (+)/Deficit (-)
Food grain (Kg)	19021	253234	(-) 92.0
Pulses (Kg)	6952	27498	(-) 75.0
Milk (Lit.)	223198	319740	(-) 30.0
Fuel wood (Kg)	131354	1519496	(-) 92.0
Water (10 <sup>3</sup> x Lit.)- Human Animal	6696	25579 9558	(-) 74.0
Fodder (Green) (Kg)	145674.5	4188740	(-) 97.0

of milk was also found 29% from the standard consumption norms. The fuel-wood deficit (98%) and fodder deficit (99%) also shows that a large part of this demand is met from the forests away from the village boundary. The water deficit (70%) also shows that the village people had either to reduce their water consumption against the standard WHO norms or devote much time to fetch water from distant sources away from their village geographical area. However, pipe line water supply from distant

sources is available in this village. Similarly, deficit of fodder indicate that the livestock is under-fed and the animals had to starve in the want of adequate fodder or a part of that is derived from grazing in the nearby grazing land/forests thus aggravating the degradation of ecosystem and decline in ecosystem services.

In Khadkuna village (Table 15), notably availability of milk, fuelwood and water was little better



**Table 14: Resource use pattern in Jyoli village**

Resources	Annual availability	Annual consumption	Surplus (+)/Deficit (-)
Food grain (Kg)	7426	91927	(-) 92
Pulses (Kg)	1593	9982	(-) 84
Milk (Lit.)	81943	116070	(-) 29
Fuel wood (Kg)	13198	807015	(-) 98
Water (10 <sup>3</sup> x Lit.)- Human Animal	2801	9286 3610	(-) 70
Fodder (Green) (Kg)	15267	1601620	(-) 99

than the other villages as indicated by a lower magnitude of deficit of these resources (17-53%) in this village. The situation of natural resources availability was still worst in Kaneli village (Table 16), except for availability of milk (deficit only 9%). Most strikingly the deficit of water is 100%, as this village does not have any natural sources (all the water sources have dried up) and the water is supplied from Government managed pipe lines drawing water from distant sources. The availability and consumption of various natural resources for Bisra village points out that here again the milk availability was satisfying (deficit only 7%) but there was also a large gap between supply and demand of the other resources for subsistence living (Table 17). With regard to milk availability the Kujyari village (Table 18) had a

comfortable position across all the villages (deficit only about 5%), however there was also an acute shortage of other resources. The Kujyari, Bisra and Kaneli villages sell milk and cottage cheese in local town Kosi and Almora to earn some money. Village Dilkote was best among all others with regard to water availability (deficit about 22%) but poor in terms of availability of all other resources (Table 19). Thus it can be seen that all the villages of Jyoli cluster face varying magnitudes of stress in terms of supply and demand of various natural resources. This situation has led to a better scope and urgent need for R&D based interventions to improve the situation of availability of these resources to contribute to the survival strategy of the people and to cope up against poverty, malnutrition, climate change impacts etc.

**Table 15: Resource use pattern in Khadkuna village**

Resources	Annual availability	Annual consumption	Surplus (+)/Deficit (-)
Food grain (Kg)	478	16767	(-) 97
Pulses (Kg)	60	1821	(-) 97
Milk (Lit.)	10038	21170	(-) 53
Fuel wood (Kg)	50000	59860	(-) 17
Water (10 <sup>3</sup> x Lit.)- Human Animal	1745	1694 562	(-) 29
Fodder (Green) (Kg)	78475	224840	(-) 65

**Table 16: Resource use pattern in Kaneli village**

Resources	Annual availability	Annual consumption	Surplus (+)/Deficit (-)
Food grain (Kg)	1366	38592	(-) 97
Pulses (Kg)	1058	4191	(-) 75
Milk (Lit.)	44347	48728	(-) 9
Fuel wood (Kg)	2270	185785	(-) 99
Water (10 <sup>3</sup> x Lit.)- Human Animal	0	3898 1279	(-) 100
Fodder (Green) (Kg)	8563	1106680	(-) 99



**Table 17: Resource use pattern in Bisra village**

Resources	Annual availability	Annual consumption	Surplus (+)/Deficit (-)
Food grain (Kg)	3070	30209	(-) 90
Pulses (Kg)	781	3280	(-) 76
Milk (Lit.)	6205	38143	(-) 7
Fuel wood (Kg)	52096	126655	(-) 59
Water (10 <sup>3</sup> x Lit.)- Human Animal	263	3051 1000	(-) 91
Fodder (Green) (Kg)	3736.82	147460	(-) 97

**Table 18: Resource use pattern in Kujyari village**

Resources	Annual availability	Annual consumption	Surplus (+)/Deficit (-)
Food grain (Kg)	6501	62008	(-) 90
Pulses (Kg)	3146	6733	(-) 53
Milk (Lit.)	74460	78293	(-) 5
Fuel wood (Kg)	9830	273385	(-) 96
Water (10 <sup>3</sup> x Lit.)- Human Animal	799	6263 2767	(-) 87
Fodder (Green) (Kg)	31892	511730	(-) 94

**Table 19: Resource use pattern in Dilkote village**

Resources	Annual availability	Annual consumption	Surplus (+)/Deficit (-)
Food grain (Kg)	180	13731	(-) 99
Pulses (Kg)	314	1491	(-) 79
Milk (Lit.)	6205	17338	(-) 64
Fuel wood (Kg)	3960	66795	(-) 94
Water (10 <sup>3</sup> x Lit.)- Human Animal	1088	1387 340	(-) 22
Fodder (Green) (Kg)	7740.9	546770	(-) 99



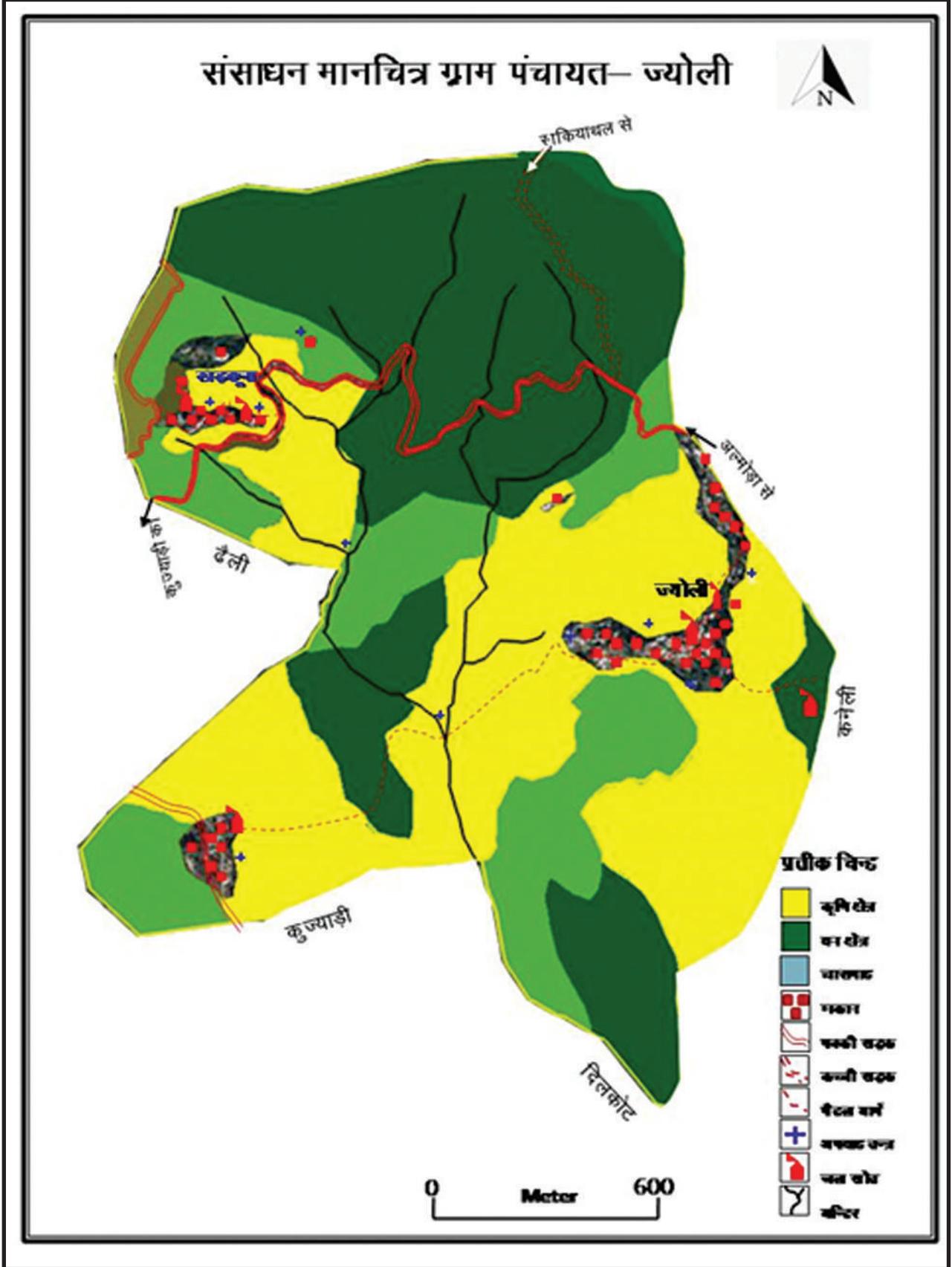


Figure 2: Resource map of Gram Panchayat Jyoli (village Jyoli and Khadkuna)

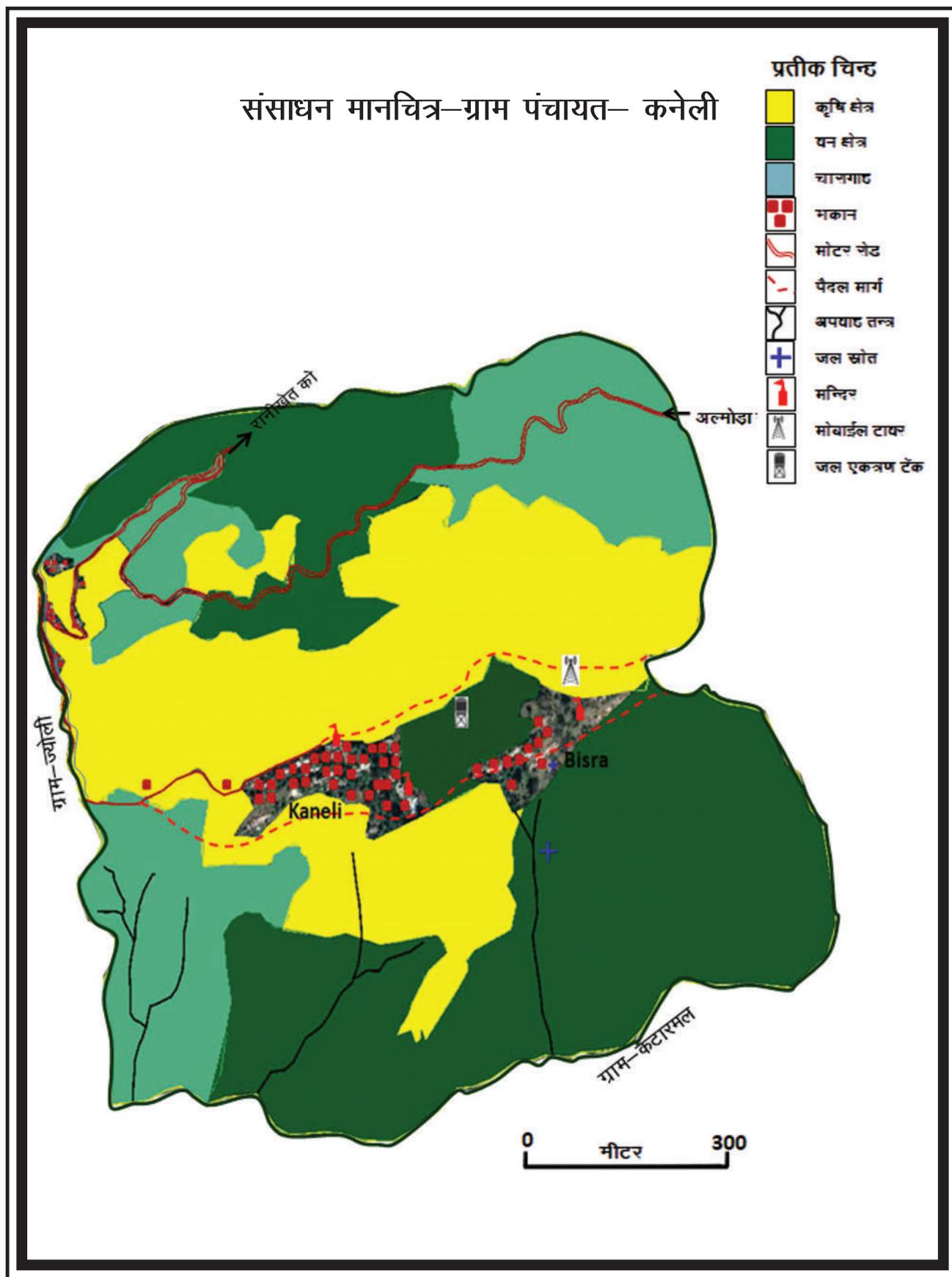


Figure 3: Resource map of Gram Panchayat Kaneli (village Kaneli and Bisra)

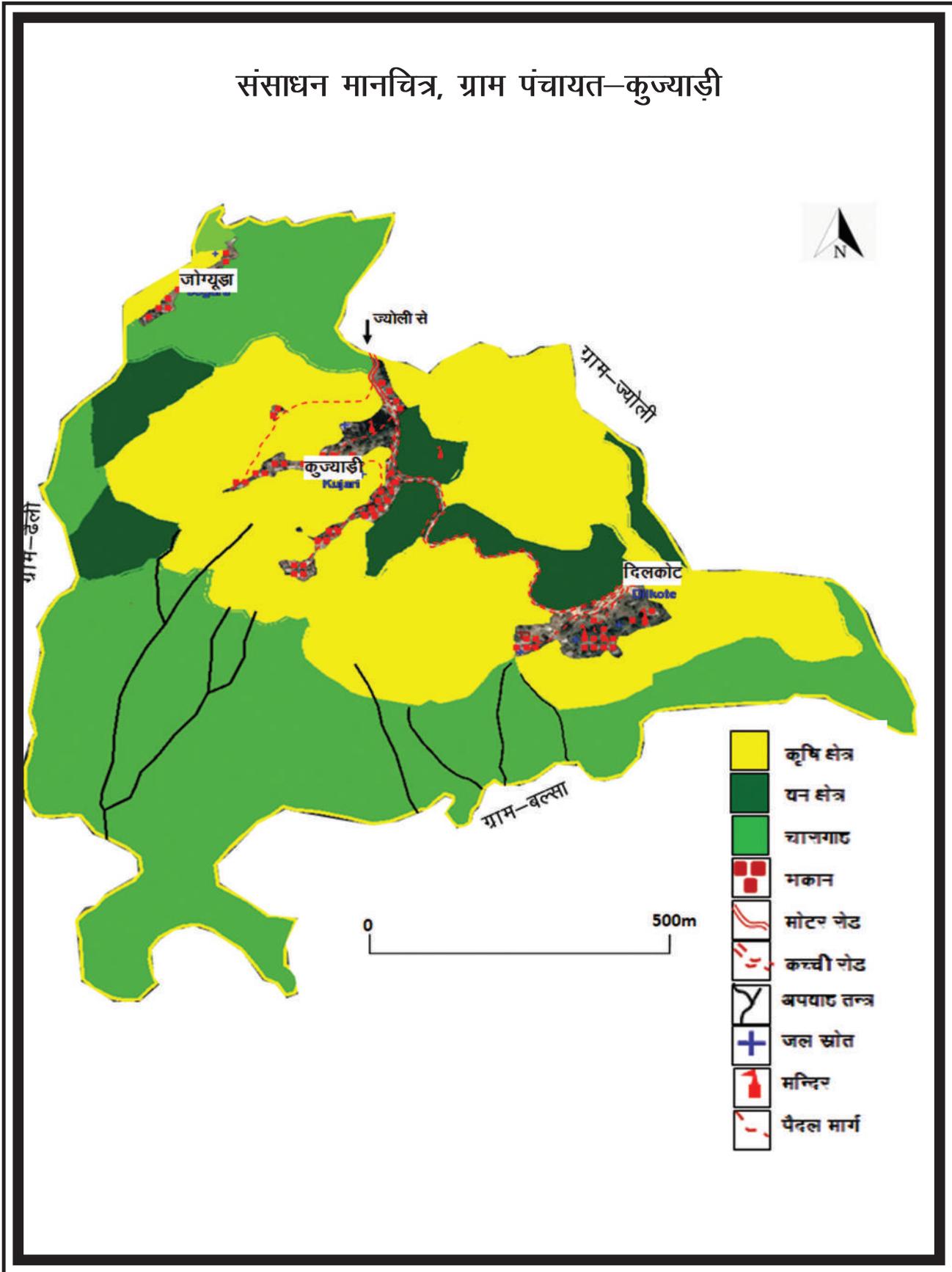


Figure 4: Resource map of Gram Panchayat Kujyari (village Kujyari and Dilkote)



## LIVELIHOOD PROMOTING TECHNOLOGY TRANSFER IN THE VILLAGE CLUSTER

To implement the “Eco-smart Model Village Concept” and achieve the goal of bringing “Transformative Change” and “Doubling Farmer’s Income by 2022”, the following steps/methodology and approach were involved in the project activities in Jyoli village cluster:

- ☞ Selection of representative village cluster
- ☞ Need assessment of village community
- ☞ Exposure visits to RTC (Rural Technology Complex) and model demonstrations
- ☞ Identification of beneficiaries for project activities
- ☞ Change leader development
- ☞ Household baseline survey
- ☞ Implementation of packages of practices among selected stakeholders
- ☞ Data collection and monitoring
- ☞ Cost : benefit of R&D interventions

### (i) Selection of representative village cluster

As discussed in Chapter- 2 after having rigorous discussions at the Institute, Jyoli village cluster was selected in view of logistic considerations: (i) Proximity to Institute HQs (Kosi-Katarmal, Almora) for frequent monitoring and upkeep of the R&D interventions; (ii) Demonstration/show-case value for various stakeholders including Apex Bodies of our Institute, and (iii) Having past background of Institute’s work in the area to utilize the assets and linkages with community/Govt. departments.

To initiate the project activities a consultative meeting was held with Gram Pradhans and a few senior citizens at RTC of the Institute at Kosi-Katarmal, Almora for smooth functioning of this Transformative Project in their village cluster on 29<sup>th</sup> June 2020. Project objectives were explained to Gram Pradhans and other participants by the project team. It was emphasized that in view of limited resources the project will be implemented on participatory basis with technical expertise and minimal material inputs from the Institute, and manpower and aftercare to be ensured by the

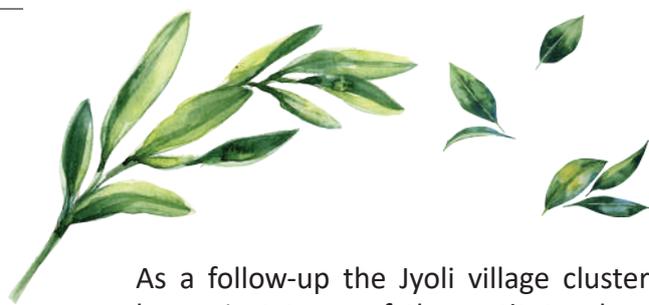
### Brief about RTC (Rural Technology Complex)

- The RTC (Rural Technology Complex) was established in 2001 at the Kosi campus of ‘NIHE’ to address the needs of hill farmers keeping in mind their location-specific technological requirements.
- The complex is being continued as self-sustained wing of the Institute to cater to the needs of farmers, developmental agencies and Government programs.

### RTC works for capacity building of the Himalayan communities by

- Providing options and trainings on interdisciplinary, practicable and comprehensive technological approaches.
- These approaches lead to improvement in the quality of life and human welfare through economic development by efficient conservation and management of natural resources
- Technologies are disseminated through trainings on crop yield increment, income generation, value addition and other life supporting activities to various stakeholders.

beneficiaries. Also, the selection of beneficiaries, identification and demonstration of technologies were carefully planned with community consultation with a focus on socio-economic development of BPL, SC, COVID affected families, marginalised women etc. They were also told that need assessment would be done in the three GPs of village cluster prior to project implementation. The delegation of Gram Pradhans assured full cooperation in implementing the project activities and expressed their gratitude to ‘NIHE’ for the selection of Jyoli village cluster for environmental conservation and development activities to be carried out under the “Transformative Project”.



As a follow-up the Jyoli village cluster was visited by project team of the Institute along with Gram Pradhans/key informants to have a preliminary assessment of the socio-economic conditions and natural resources status in the form of forest, water, agriculture land, biodiversity etc. During field visits, interactive discussions were held with local people to identify problems related to natural resource management, agriculture and other allied sectors. Following this in each of the three GPs of this village cluster, community-level meetings were held by the project team in which the village people were explained about the project objectives, work elements and activities, timelines, budgetary constraints etc. Emphasis was given on participatory approach, synergy building among community resources and dovetailing with Govt. scheme/programmes. In these meetings community-level priorities were identified to address the environmental conservation and

livelihood improvement in the village cluster. A chronology of all events/ training workshops etc. we conducted under this project in the village cluster and at the RTC is given in Annexure IV. To begin the project, a project launch-cum-interaction workshop was organized on 5th July 2020 at the RTC of the Institute, which was inaugurated by Hon'ble MP of Almora Parliamentary Constituency Shri Ajay Tamta ji. This event was attended by the people of project villages, Institute faculty and others.

**(ii) Need assessment of the village communities**

In order to precisely understand the household-level needs and their willingness to adopt livelihood promoting technologies, five consultative meetings at Gram Panchayat level for need assessment and community mobilization were held during August 2020, followed by exposure visits of village people to RTC to have a live demonstration of various low-

**Launch of Jyoli village cluster project by hon'ble MP, Lok Sabha, Almora**





cost, environment-friendly technologies, and discuss the project planning and implementation strategies. In these meetings, detailed information was given to the village people by us about the work to be done in the villages under the Model Village Development Project so that they can identify the appropriate technology options to be adopted by them in view of resources available with them.

### **(iii) Exposure visits to RTC**

These interactions with each of the three GPs were followed by exposure visits to the RTC of 'NIHE' where the participants learned about various R&D packages of practices/demonstrations and interacted with Institute scientists about their feasibility of adoption in their respective households/villages. The various R&D based package of practices available in the RTC are given in Annexure V. A matrix of various need based R&D technologies opted by 177 HH of the three Gram Panchayats of Jyoli village cluster is given in Annexure VI.

### **(iv) Identification of beneficiaries for project activities**

In view of the limited project resources BPL families, weaker sections, COVID returnees, marginalised women etc. were given preference over others for putting up these R&D based livelihood improving and income generating activities. Subsequently, we invited proposals for selected livelihood interventions from the village people endorsed by Gram Pradhans to ascertain the need of the applicants and maintain transparency of our approach/activities. Thus, a total of 62 households were directly covered under the project activities belonging to weaker sections, BPL, COVID returnee, women etc.

### **(v) Change leaders development**

In order to optimize our R&D efforts and given the limited resources we have adopted the "Citizen Science" approach wherein we groomed over a dozen of talented youth of the village cluster named as "Change Leaders" (Annexure VII). It was a two-pronged strategy to build their capacity in various aspects of environmental conservation and sustainable development of mountain ecosystem in general, and particularly the Jyoli village cluster. These CLs were trained by us for village-level household surveys, village resource use mapping,

mapping village development priorities, livelihood interventions such as protected cultivation, organic farming, poultry farming, wasteland plantations, preparation of smokeless bio-briquettes using Pine leaf litter, organization of village-level meetings, preparation of proceedings, news items etc. We further plan to continue to build the capacity of these CLs so that they can become environmentally-conscious responsible citizens by their voluntary participation at Gram Panchayat/Block level activities for improving resource-use efficiency, green skill development of the people, building upon natural and intellectual capital and eco-smart thinking in the villages by employing carrying capacity concept of mountain ecosystems. Association of these CLs with our Institute gave them a moral boost and improved their understanding and exposure from a local scale, and its relevance at the regional and national scale. Moreover the confidence of the change leaders have increased and seven of the change leaders have been engaged in computer operator and sales job after their capacity building under the Transformative Project. Competitive essay writing on "My Model Village" written by them were very impressive and awarded top positions (Annexure VIII). A Change Leader, Ms. Deeksha Upadhayay participated in the Institute's Annual Day, 2022 and delivered a short talk on success of R&D activities of 'NIHE' in Jyoli village cluster. This initiative will also feed into "Science-Policy-Practice" interface and following cardinal principles: (a) science for society, (b) networks and collaborations, (c) success model promotion, (d) private sector engagement, (e) harness energies of bright energetic young professionals, and (f) use of technology to further out-scale and upscale in the region.

### **(vi) Household baseline surveys**

To document the socio-economic and environmental change in the Jyoli village cluster, household baseline surveys were conducted by us and the Change Leaders were also trained for this activity through training workshops. They were provided with structured HH survey questionnaires to be filled in by the head of each of all the 303 HH of six villages using Unnat Bharat Abhiyan questionnaires (<https://unnatbharatabhiyan.gov.in:8443/new-website>; Annexure III) translated in Hindi and making some region-specific modifications. This HH survey was



## Capacity building of Change Leaders of Jyoli village cluster



participatory with the village representatives and the CLs under our regular mentoring. It was thought prudent that the village youth can derive the data/information more precisely than the outside surveyors. Thus, not only capacity of youth was built on the HH surveys but they were oriented towards village-level planning of resources for developmental process. The HH level data was then compiled at the Jyoli Village Resource Centre by one of the CL Mr. Gajendra Upadhyaya and now this data base is serving as a service centre for seeking village level information on several parameters to local people, Govt. agencies, NGOs etc.

### **(vii) Implementation of packages of practices among selected stakeholders**

On the basis of the need-assessment and

reconnaissance survey across the village cluster, a few promising R&D package of practices were provided to the village people (62 households) along with the technical know-how and institutional support. Before implementation our project team made a technical assessment and assessed socio-economic feasibility of the prospective beneficiaries and an application duly forwarded by the Gram Pradhan was obtained from them for our project records and further monitoring in future. We employed a range of activities and approaches in this village cluster for bringing a “Transformative Change” among the people, particularly the weaker sections through various training workshops and other events (64 nos.) we could reach to 1381 people (779 Male, 602 Female) of the project area. Polyhouse construction for growing vegetables, (40 HH), Poultry farming (85



HH), Bee keeping (18 HH), Bio-briquetting (6 HH), Vermi composting (6 HH), green skilling to prepare Rakhi/Aipan (19 HH), Roof top rain water harvesting (2 HH) and plantation of fruit trees (4 HH) were the major livelihood promoting interventions made at the HH level. Among the community level interventions, wasteland plantation (1.5 ha) and construction of Pine needle check dams (10 nos.) for soil and water conservation were put up along a seasonal stream.

Brief description of various livelihood-promoting interventions is given in Table 20.

### A. Organic farming and protected cultivation

In Uttarakhand, cultivation of vegetables constitutes an important part of agricultural activity undertaken with about 23% total cropped area of the State (Horticulture Deptt. 2010-11). Since the climatic conditions of the hilly states are suitable for off-

**Table 20: Brief description of various R&D based livelihood enhancing and income generating activities promoted in the Jyoli village cluster**

S. No.	Name of R&D intervention	Details of activities/intervention
1.	Protected cultivation (Poly-houses 40 nos.)	<ul style="list-style-type: none"> <li>Beneficiary was provided with 30x10x8 ft. and 20x10x8 ft. size UV stabilized polythene sheets and 50% green shade net for enclosing lower part of polyhouse for ventilation</li> <li>The bamboo frame (poles erected as per our layout and bamboo frame for roof of polyhouse) and labour to erect the polyhouse was provided by the beneficiary</li> <li>We provided technical supervision at the time of polyhouse making and cultivation of vegetables (agro-technologies)</li> <li>Seed/seedlings/root stock was given to selected families free and tie up was done with local Agriculture Departments (KVK)</li> </ul>
2.	Vermi-composting (6 Units)	<ul style="list-style-type: none"> <li>Compost pits of 6x6x3 ft. were constructed with single brick wall. To prevent the movement of earthworms deep down, a concrete floor was papered. Whole structure was covered with erected bamboo and Polythene sheet to protect it from rain</li> <li>Common earthworm species <i>Eisenia fetida</i> (black gold) was introduced in these vermi-pits</li> </ul>
3.	Poultry farming (85 HH)	<ul style="list-style-type: none"> <li>One day old chicks (ODCs) were distributed among the beneficiaries</li> <li>Preference was given to weaker sections</li> <li>The poultry shed was made by the beneficiaries themselves</li> <li>The feed/medicines etc. was purchased by the beneficiary</li> <li>Visits of Livestock Husbandry Department doctors were arranged</li> </ul>
4.	Bee-keeping (18 HH)	<ul style="list-style-type: none"> <li>A two-week long training on bee keeping was imported to the beneficiaries and they were given bee boxes with honey bee (<i>Apis cerana</i>) colonies</li> <li>Technical guidance was given to them as and when required using through WhatsApp platform</li> </ul>
5.	Bio-briquettes (Pine needles converted to smokeless fuel) (6 HH)	<ul style="list-style-type: none"> <li>Training and demonstration were held among the villages by our project team</li> <li>A mould for making bio-briquette was given to each of the three Gram Panchayats</li> <li>The beneficiaries collected Pine needles (Pirul) from nearby forests and made the bio-briquettes</li> </ul>
6.	Aipan/Rakhi making (25 HH)	<ul style="list-style-type: none"> <li>Training and base material was given to selected women/youth of the villages</li> <li>They prepared these items and sold locally and also used themselves</li> </ul>
7.	Horticulture / Orchard development	<ul style="list-style-type: none"> <li>Elite saplings of high yielding varieties of temperate fruit trees (Peach, Plum, Apricot, Walnut, Guava etc.) were distributed and silvicultural technique of orchard development was demonstrated to the people.</li> </ul>
8.	Roof-top rain water harvesting (2 HH)	<ul style="list-style-type: none"> <li>Weaker section people / COVID affected families were selected</li> <li>HH used water for kitchen gardening/use in polyhouse for vegetable cultivation/ cattle demand</li> </ul>
9.	Wasteland plantation (1.5 ha)	<ul style="list-style-type: none"> <li>Multi-purpose tree saplings were planted in 1.5 ha wasteland through community participation</li> <li>Height growth and survival of each of the species was measured periodically</li> </ul>



season vegetable crops such as tomato, cauliflower, cabbage, vegetable pea, cucumber, french beans, capsicum etc. in different zones in the hills, it offers a huge potential for employment and income generation to the farmers. The off-season vegetable farming refers to the production of vegetables by using different agro-climatic conditions, adjusting the time of transplanting, selecting and improving the varieties and/or creating a controlled environment. This is because the off-season vegetables that are raised in the hilly areas are made available to the consumers in the plains at the time when these cannot be grown there due to hot climatic conditions. With the changing agricultural scenario in the Uttarakhand state, protected cultivation of vegetables and flowers has become an important enterprise for the farming community because of its low volume and high value production system. Growing vegetables in the polyhouse is the common method of protected cultivation in this region. We conducted several training programmes as well as demonstrations to update the knowledge of the farmers and required inputs in the form of seeds, planting materials and LDPE polythene sheet etc. The bamboo frames were prepared by them on their own expenses under our supervision. Also, vermi-composting was promoted among 6 HH in the village cluster by providing them material input and Earthworms (*Eisenia foetida*) and the cattle dung, and labour input were provided by the beneficiaries. Selection of stakeholders was done on the basis of willingness to adopt the technology, manpower availability, availability of suitable land, etc.

### **B. Honey bee keeping and pollination services**

Honey bees are the nature's precious gift to the humans on the earth. They not only produce miraculous substance- honey, but also significantly contribute a great deal to the food production through cross-pollination, and responsible for about 80% of the total cross-pollination by insects, and thus support life on the earth. Therefore, in order to meet the ever increasing demand of food for fast growing human population, conservation of honey bees is essential. For instance-the apple growers in Himachal Pradesh and J&K are hiring bee colonies and hanging buckeyes in apple orchards to supplement bee pollination and increase crop yield and also improve the quality of apple as well. Renting

bee colonies (@ Rs. 1000) per flowering season in apple orchards of Himachal has become a lucrative business (Lal et al., 2012). Unfortunately, in the recent years practice of Bee keeping has been ignored that has a vast potential and multiple benefits- creating livelihood opportunities, production of Honey, Royal jelly, Pollen, Bee wax, Bee venom, and above all pollination of food crops. Traditionally, rural areas of Uttarakhand hills were known for bee keeping. It used to be an integral part of most of the households and people used to rear honey bees. But with the passage of time, for the last three-four decades, the bee keeping practice has taken a back seat, despite thrust by the Government through various schemes. Besides declining floral diversity and vegetation, use of pesticides, change in crop system, road connectivity and networking along with other construction activities has also hampered the bee population. To initiate bee keeping activity among the people of Jyoli village cluster, we organised a two-week long training program involving experts and bee keepers. After successful completion of the training, bee-boxes (*Apis cerana*) were distributed to them. These bee keepers are in regular supervision of a honey bee expert (Er. Deep Bisht, Spardha, Almora) through a WhatsApp group and also by visiting the households occasionally to attend their complaints.

### **C. Backyard poultry**

Backyard poultry farming has been an inevitable part of sustainable livelihood of Indian farmers. It provides not only food security but also employment to the farmers and rural youth. The poultry farming is known for its uniqueness as the chick birds are good foragers, efficient mothers and require minimal care to grow. Thus making them a suitable species to raise under village conditions for income generation and livelihood supplement, particularly for women and weaker sections. Backyard poultry contributes significantly to income and act as very good source of quality protein to landless and marginal farmers. Traditionally the people in the Jyoli village cluster practice cattle and goat rearing and keep poultry as a source of supplementary income. Despite some people having backyard poultry, their suitable varieties and scientific raising is still lacking. We have promoted Vanraj variety of poultry, which is popularised and found suitable for this region by ICAR. Therefore, for attaining the objective of



Pine needle based products ( File cover, file folder, carry-bags, envelopes , note-pad, wedding card, aipan and rakhi)of 'NIHE'

livelihood supplement through backyard poultry, beneficiaries were selected in the Jyoli village cluster and priority was given to SC/BPL, COVID affected families, physical capacity of stakeholder, availability of area for foraging of chick-birds, etc.

#### D. Bio-briquetting from Chir-Pine needles

Pine (*Pinus roxburghii*) tree is considered as an unwanted and obnoxious species in the forests of this region as it does not provide fodder for livestock, good quality fuel wood and it is a main reason of forest fire due to its resin bearing inflammable needle leaves. This species is also accused for drying up of springs and water sources as it is a voracious user of soil water owing to its fast growth. We demonstrated multiple uses of this tree useful for promoting livelihood activities such as use of needles for making smokeless bio-briquettes, use of bark, cone and needles for decorative items, use of Pine needles (Pirul) in making check dams for soil and water conservation etc. Pine needles have been successfully used by us for making handmade paper and making items such as file cover, file folder, envelopes, carry bags etc. At the RTC the method of preparation and use of bio-briquettes has been quite successful (Negi et al., 2022), and has a great potential for scaling up in the region. These smokeless bio-briquettes are made by the women and weaker sections for their own use for cooking, heating and also for livelihood generation options. The trained expertise of Master Trainers and Faculty is available with the Institute and has been providing trainings to various women and weaker section based SHGs of various state agencies and NGOs.

#### E. Green skill development

The Green business is a concept to increase the livelihood of the rural people through capacity building, skill development and entrepreneurship development by making various marketable items made from available natural resources in a sustainable way. The MOEF&CC, Government of India under its ENVIS Secretariat is coordinating Green Skill Development Program (GSDP) in our country with an aim to make the school drop-outs and youth to exchange and build skill to utilize the resources for income and employment generation (<http://www.gsdp-envis.gov.in/>). There are plenty of available natural resources in the forests of Uttarakhand. Pine trees are found abundantly in the forests of Uttarakhand. It is the source of fuelwood, timber and resin. Annually, Uttarakhand forests produce about 1.9 million ton of Pirul (Sati, 2020). The inflammable leaves (Pirul) fall in the summer season and cover the forest floor and pose potential forest fire hazards and colossal loss to forests every year (Negi, 2019). It is highly inflammable and one of the major factors of forest fire causing huge damage to the forests in Uttarakhand every year resulting the loss of biodiversity and other assets. Keeping in view the hazardous nature of Pine needles and cone, we used them for making decorative items, Rakhi, biofuel (bio-briquettes) and handmade paper so that it will reduce the risk of forest fire in the forest and provide the alternative livelihood to the local people (Arya and Negi, 2020). At the RTC we have made several products of Pine needles those can be adopted for livelihood support and income-generation in the village.



### F. Wasteland plantation

More than three-fourths of Uttarakhand's total population depends on agriculture for their livelihood and the economy is predominantly dependent on agriculture. However, the land holdings are small and fragmented, and irrigation facilities are limited. Soil and water conservation is another important activity for development of farming systems. For physical, geographical and environmental reasons, the scope for agricultural policies based on modern input-intensive agriculture is extremely low in the hill regions. As a result, majority of the rural population in the hills either survives on subsistence agriculture or migrates to other parts of the country for employment. The agricultural land is being abandoned gradually that is being occupied by weeds such as *Eupatorium*, *Lantana camara*, *Parthenium* etc. Such wastelands need to be put under plantation of multipurpose tree species (MPTs) so that provisioning of the five Fs (fuelwood, fodder, fruit, fibre and fertilizer) is ensured in the long-run. In the recent decades, plantations are carried out by several departments but the successful plantation depends upon right choice of species suiting to the site-specific micro-climatic conditions. We have kept this consideration in the project and taken up a community wasteland (1.5 ha) for plantation and soil and water conservation measures through involvement of the village people.

### G. Rooftop rain water harvesting

As described earlier, water is a scarce resource in this village cluster and the entire area is dependent on rainfall for crop-cultivation. This is one of the major constraints for not adopting improved farming practices in this village cluster. We introduced roof-top rain water harvesting in a few needy BPL households to demonstrate its impact on use of land of kitchen gardening, sanitation and other related household uses. Data was collected about the duration of rainfall, roof-top water harvested in the tank and use of the stored water in various HH activities and non-consumptive use.

#### (viii) Data collection and monitoring

To record the daily/weekly/seasonal data/brief details of activities such as protected cultivation, poultry farming and bee keeping by the beneficiaries we provided data registers to each of the beneficiary

HH so that they can enter the various inputs and outputs everyday accrued due to these livelihood practices and output-input (O:I ratio) and net benefit to the HH is calculated. For instance, in case of poultry farming initial cost of ODC (given by us free), feed purchased and medicine (if any) were taken as inputs, and eggs and birds sold/consumed by them as outputs. Mortality of chick birds and reasons thereof were also recorded in these daily registers. Similarly, for protected cultivation in polyhouses the input in terms of seed/seedling, labour, fertilizer/manure were recorded as inputs and yield of vegetables (either consumed or sold by them) were recorded as outputs. Similar was the case for honey bee keeping and other interventions. We monitored this data/information regularly and necessary corrections were made in case the entries were not found proper in consultation with the beneficiaries through periodical visits to the village cluster by our project team. It may be pointed out that some of the people did not take keen interest and became negligent on the entry of data / information in the data sheets/ registers given to them. Some of the people were not so meticulous about measuring the yield in terms of weight units, rather local measurement units (e.g. bundle of leafy vegetables, baskets, sack etc.) were used, and we converted these measurements in to gram or Kg/unit.

#### (IX) Cost: benefit of R&D interventions

For estimation of O:I in case of vegetable production in polyhouses the average age of polyhouse has been considered five years. Therefore, the input cost of silpoline sheet has been divided by five to estimate annual input cost. Both the inputs and outputs were equated in terms of money as per the local existing rates in the village market/shops and output-input (O:I) and benefit: cost (B:C) ratio was calculated for each of these interventions. Six social media WhatsApp groups for these activities i.e. bio-briquetting, poultry farming, bee-keeping, green skilling, protected cultivation and change leaders were created for interaction among themselves and with our project team on any issues with the beneficiaries, monitoring progress, information about meetings, village visits, source and availability of seeds/seedlings of vegetables and Government programs nearby etc.



## Data registers and monitoring of project activities in Jyoli village cluster



## Apex bodies visit to the Jyoli village cluster





## DOUBLING FARMER'S INCOME IN TWO YEARS

In the Jyoli village cluster a number of environment-friendly, livelihood promoting and income generating interventions were implemented from September 2020, those continue till now. In these interventions protected cultivation in poly-houses, poultry farming and bee keeping were prominent. In total 62 households were directly benefitted through these activities (Annexure IX). The salient description of benefits accrued through these interventions is given below:

### Vegetable cultivation in polyhouses

In this village cluster we could mobilize the target households to raise 40 polyhouses of two different sizes (depending upon the space available) utilizing their man-power with our material (silpoline sheets and green shade nets) and technical know-how (Table 21). To install the polyhouses among the beneficiaries a visit was made to their houses and site for the polyhouse construction was decided

from the local Krishi Vigyan Kendra (KVK), Almora. Frequent visits and interventions were held with the beneficiaries regarding any issues of vegetable cultivation in polyhouses. We organized 6 training programmes in which 100 beneficiaries were trained about protected cultivation. Exposure visits of the farmers were also conducted to the farms of some successful farmers who have been practicing protected cultivation successfully and earning livelihood out of it in this village cluster.

Total area thus brought under protected cultivation was about 0.1 ha, and a total of 19 vegetable varieties were grown within these polyhouses during September 2020 onwards so far. Yield potential of each of the vegetable crops is given in Table 22. Based on the yield potential and better O:I (>1), vegetable crops such as Tomato (*Solanum lycopersicum*), Onion (*Allium cepa*), Radish (*Raphanus sativus*), Coriander (*Coriandrum sativum*), Capsicum (*Capsicum*

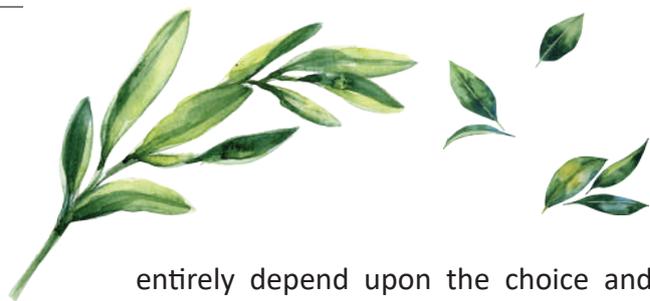
**Table 21: Details of beneficiary of polyhouses and vegetable production**

Name of the village	No. of beneficiary HH	Category BPL/SC/COVID/Gen	Production (Kg/year)
Jyoli*	24*	-	Not recorded
Kujyari	18 (12 Kujyari+ (6 Jogura)	18 BPL, 12 General, 6 SC	899
Dilkote	3	3 BPL, 2 SC, 1 COVID returnee	150
Bisra	6	6 BPL	300
Kaneli	13	13 BPL, 6 SC	649
<b>Total / Mean</b>	<b>40 (64)</b>		

\*Polyhouses made under earlier project of CSED (2017-2020).

keeping in view the sunshine hours/east–west directions and other site-specific factors. The polyhouses were erected on bamboo poles arranged by the beneficiaries and the UV reinforced silpoline sheet was provided by us. Technical help was provided while installing the polyhouse. Thus, 40 such polyhouses were installed in the village cluster. Beneficiaries were given technical know-how of planting various seasonal/off-season vegetables and other crops as well as seed/seedlings of vegetables

*annuum*), Brinjal (*Solanum melongena*), Beans (*Phaseolus vulgaris*) etc. were found suitable for the agro-climatic zone of this region, and hence can be recommended to other farmers also. It is to be mentioned that people try a range of combinations / sole crops of both vegetables and spices in these polyhouses and the land space devoted to each crop varies from one HH to another and from one crop to another. Also, the choice of crops grown, their combinations and other structural operations



entirely depend upon the choice and knowledge level of the HH. They harvest the produce whenever it is mature to consume. The quantity harvested also varies from one HH to another. Thus, it become quite tedious to determine the per unit area yield of these crops. Therefore, we have given the average yield of each of the crops per polyhouse grown across the season. Across all the crops production of garlic (30 Kg) was the lowest and Radish (441 Kg) was the highest. The total vegetable / spices production was computed 2616 kg (December 2020 -September 2022). In terms of market price the lowest rates were fetched by Potato, Bitter Gourd, Radish and Amaranth (@ Rs. 20/kg), and the highest by Beans (Rs. 80/Kg) and Coriander leaves (Rs. 100/ Kg). Total earning from the Polyhouse produce (both self consumed and sold locally) was recorded lowest for Bitter Gourd (Rs.720) and highest for

Coriander leaves (Rs.20,000) from the entire village cluster. Coriander was the most profitable crop also in terms of O:I ratio (3.99) as compared to lowest for bittergourd, Potato, Cucumber (O:I= 0.13,0.17 and 0.18) and Bitter Gourd (0.13). In terms of O:I, crops such as coriander, bean, tomato and capsicum were also superior (O:I= >1), and these crops have also readymade local market. People told that fresh vegetables are sold at their doorsteps and purchased by their neighbours, and they do not have to go to the market now for purchase of vegetables for their self consumption. It is envisaged that other farmers in these villages will adopt this technology and become self-sufficient in vegetable production and would also earn some income. These vegetables thus produced catered to their own consumption as well as sale in the Jyoli village and nearby Kosi shops were worth Rs. 1,19,795 (Table 22) with overall B:C ratio of 2.66 (Table 23).

**Table 22: Crop wise production and out: input ratio under protected cultivation in Jyoli village cluster during December 2020-September 2022**

S. No.	Vegetable crops	Total production (Kg)	Average market rate (Rs./Kg)	Market value (Rs.)	Per polyhouse average output (Rs.)	Input cost (Rs.)/ polyhouse	Output:Input
1.	Beet leaf ( <i>Beta vulgaris</i> )	95	40	3800	100	142	0.70
2.	Fenugreek ( <i>Trigonella foenum-graecum</i> )	122	40	4880	128	142	0.90
3.	Leafy mustard ( <i>Brassica juncea</i> )	100	32	3200	84	147	0.57
4.	Amaranth ( <i>Amaranthus viridis</i> )	35	32	1120	29	137	0.22
5.	Radish ( <i>Raphanus sativus</i> )	441	20	8820	232	132	1.76
6.	Coriander ( <i>Coriandrum sativum</i> )	200	100	20000	526	132	3.99
7.	Pea ( <i>Pisum sativum</i> )	96	30	2880	76	158	0.48
8.	Onion ( <i>Allium cepa</i> )	179	30	5370	141	132	1.07
9.	Tomato ( <i>Solanum lycopersicum</i> )	328	45	14760	388	174	2.23
10.	Chilli ( <i>Capsicum sp.</i> )	121	40	4840	127	145	0.88
11.	Capsicum ( <i>Capsicum annum</i> )	228	55	12540	330	148	2.23
12.	Brinjal ( <i>Solanum melongena</i> )	229	40	9160	241	142	1.70
13.	Beans ( <i>Phaseolus vulgaris</i> )	153	80	12240	322	140	2.30



14.	Potato ( <i>Solanum tuberosum</i> )	45	20	900	24	143	0.17
15.	Cole crops ( <i>Brassica oleracea L spp.</i> )	95	45	4275	113	142	0.79
16.	Cucumber ( <i>Cucumis sativus</i> )	33	30	990	26	143	0.18
17.	Bitter gourd <i>Momordica charantia</i> )	36	20	720	19	143	0.13
18.	Ginger ( <i>Gingiber officinalis</i> )	50	60	3000	79	158	0.50
19.	Garlic ( <i>Allium sativum</i> )	30	61	6300	166	158	1.05
	<b>Total / Mean</b>	<b>2,616</b>	<b>820</b>	<b>1,19,795</b>	<b>3,153</b>	<b>2,758</b>	<b>1.14</b>

**Table 23: Cost of cultivation in polyhouse and B:C ratio (mean across 40 Polyhouses)**

Size of polyhouse (ft)	Total cost of polyhouse installation*	Input cost**	Total expenditure on cultivation / polyhouse (Rs.) two years	Total cost of cultivation / Polyhouse (Rs.) ** two years	Gross return (Rs./ Polyhouse)	Net return (Rs./ Polyhouse)	B:C
10x30	7,525	1,500	1,505	3,005	11,000	7,995	2.66

\*(Poly sheet + Bamboo poles +2 skilled man days for one day); \*\*(Seeds, seedlings, manure, plant protection material and irrigation etc).

We found that willingness for protected cultivation varies from one community to other. In Bisra village 60% women farmers exhibited their interest in protective farming, while in neighbouring Kaneli village it was found to be 20%. Considering economic class, 50% of interested farmers from Bisra and 20% from Kaneli villages falls under BPL category. In Kuyari-Dilkot cluster a total of 30 farmers (with 30% women) took part in training on protected cultivation. The representation of women was recorded higher in Dilkote village i.e., 60%. Initially a

group of 5 motivated farmers took up the cultivation of vegetables in polyhouses. Gradually more and more farmers joined and adopted vegetable cultivation as an enterprise. Today 40 farmers are growing vegetables in polyhouses in the village cluster and acknowledged benefits such as: (i) Gain in knowledge and skills, (ii) Vegetable production in the polyhouses for their own use and also for sale, (iii) Reduction in problems such as pests and wild life raiding of crops in open, and (iv) Increased economic benefits and nutritional security.

### Protected cultivation activities in Jyoli village cluster





### Vermi-composting

Vermi-composting is a method of preparing nutrient enriched compost with the use of earthworm that is one of the easiest methods of recycling farm waste and to produce quality compost of farm use. Worm cast, which is also popularly known as black gold prepared by *Eisenia fetida* species of earthworm commonly found in the region. Earthworm consumes biomass and excrete it in digested form called worm cast or vermin compost. This compost is rich in nutrient, growth promoting hormones and beneficial microorganism, etc. It takes around 45-50 days to decompose to finally prepared wormcast. Vermicompost is becoming popular now-a-days as it is a major component of organic farming system.

Vermi-composting has been emerging as an important source in supplementing and substituting chemical fertilizer in hill farming. There is a big demand for vermi-compost among hill farmers as it is used to increase quality of agri-produce. Keeping this point in mind for farming sustainability 6 HH were selected for introduction of this technology and development of vermin-composting units. Households were selected on participatory basis, availability of area and inputs like cow dung and farm waste. Compost pits of 6x6x3 ft. were constructed with single brick wall. To prevent the movement of earthworms deep down, a concrete floor was prepared. Whole structure was covered with erected bamboo and Polythene sheet to protect it

from rain fall. Now each house hold is producing nearly 2-3 quintals of compost during every season and annually harvest around 6-8 quintals of vermi-

compost depending on weather condition and availability of farm waste and using it for their vegetable production profitability.

### Protected cultivation activities in Jyoli village cluster





### Poultry farming

In the village cluster in September, 2020 we provided 1251 one day old chicks (ODC) and chick feed to 45 HH initially for a few weeks until the tender chicks are acclimatized and adapted. Again in December 2021 we provided 720 ODCs to 18 HHs. In July 2022 total 729 ODCs were provided to 22 households. Thus a total of 2700 ODC were distributed among 85 households in Jyoli village cluster (Table 24). Poultry farming was not preferred by Khadkuna village people those belong to upper caste and consider it as an inferior activity for livelihood. The beneficiary HH took care of poultry feed and after care. The details of inputs invested in this activity and outputs obtained such as eggs and birds and causes of mortality of the chicks were recorded in the data registers by the beneficiaries. Mortality of chick birds was recorded 5-23% across the villages (mean= 17%) owing to various reasons such as temperature anomalies and predation by cats and eagles (Table 24). Mean age of first egg laying by the chick birds was 236 days (Table 25). The weight of adult male bird was 3.1 Kg while that of female bird was 2.3 Kg at 40 weeks age. The mean weight of egg was found 61 gm at 72 weeks age of the bird. On average one bird lays 112 eggs (range= 98-120) in its entire life span of 72 weeks. Frequent visits of veterinary doctors from Animal Husbandry Deptt. of Distt. Almora were also conducted to

attend to the diseases and nutrition related help to the beneficiaries. On average, the ODC recorded a high rate of survival (83%) after 6 weeks (Table 25). The one year cycle of poultry farming shows that the B:C ratio is 2.13 inclusive of all cost inputs (chick feed, medicines, etc.) and outputs (sale of eggs and birds) (Table 26).

In two years time (between December 2020 and September 2022) the total egg production was 21,742 and money earned due to sale of eggs and chick birds was recorded Rs. 6,95,100. Eggs and birds were sold easily to the neighbours and the farmers did not have to go to market for their sale. Our regular interactions with the beneficiary HH revealed that availability of ODC is the biggest bottleneck in scaling up Poultry farming as a livelihood option. However, chick feed is not a big constraint as there is enough scope of open foraging of chick birds in the villages. The only hatchery exists in the area is at District Poultry Farm, Hawalbagh (Distt. Almora) and the demand for ODCs is always many-fold higher than the supply. One beneficiary Mr. Anand Singh of Bisra village has experimented on ODC production and has been successful in establishing a small self-made hatchery of 100 ODC capacity. We promoted him and provided accessories to scale it up to 200 ODCs as fresh eggs are available in this village cluster.

**Table 24: Details of beneficiary of poultry farming and benefits accrued between December 2020 and September 2022**

Village	No. of beneficiary HH	Beneficiaries (BPL/GEN)	SC/COVID	DOC given/DOC Survival* (%)	Total production (eggs)	Total earning till date (Rs.)
Kujyari	29	16	17	596 (59)	8400	202740
Dilkote	18	1	17	339 (66)	2470	112600
Kaneli	10	3	7	241 (62)	2586	207790
Bisra	6	6	-	237 (62)	2806	85470
Jyoli	22	-	22	170 (40)	5480	86500
<b>Total</b>	<b>85</b>	<b>26</b>	<b>62</b>	<b>2700 (58.0)</b>	<b>21,742</b>	<b>6,95,100</b>



**Table 25: Production parameters in backyard poultry farming in Jyoli village cluster (mean value ±SE)**

Parameters	Kujyari	Dilkote	Kaneli	Bisra	Jyoli	Total
Chick mortality before 6 months (%)	21.4±0.8	16.8±1.5	23.4±1.8	17.5±1.4	5.2±0.9	17.0±0.5
Mortality from 7 to 72 weeks (%)	2.12±0.16	1.71±0.32	2.6±0.26	2.1±0.20	0.73±2.8	1.7±0.13
Age of Chick-birds at first egg laying (days)	235±1.3	238±2.8	236±1.1	237±2.7	236±1.8	236±1.4
Adult body weight of male bird at 40 weeks (kg)	3.4±0.22	2.9±0.30	3.0±0.37	3.3±0.49	3.2±0.18	3.07±0.16
adult body weight of female at 40 weeks (kg)	2.4±0.20	2.3±0.58	2.5±0.19	2.2±0.62	2.5±0.0.82	2.3±0.42
Egg weight at 40 weeks (g)	53.56±0.46	54.52±0.33	53.38±0.37	55.19±0.41	54.73±0.29	54.28±0.38
Egg weight at 72 weeks	61.76±0.70	62.32±0.46	60.48±0.53	58.25±0.42	60.83±0.27	60.73±0.57
Total egg production	116±1.15	98±0.98	112±0.56	114±0.52	120±1.22	112±1.26

**Table 26: Benefit : cost ratio for one year cycle of Poultry farming**

Items	Average of total cost and return (Rs.)
a). Gross cost	20879.00
b). Gross return	44380.00
Sale of eggs	17780.00
Sale of birds	26600.00
Net return (b-a)	23501.00
<b>Benefit-Cost Ratio</b>	<b>2.13</b>

**Poultry farming activities in Jyoli village cluster**





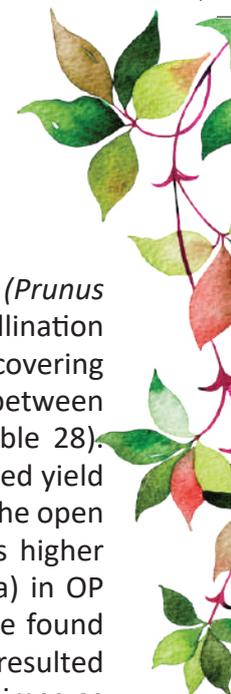
### Honey bee keeping

In this project we conducted a two week-long training programme for 25 selected people of the Jyoli village cluster involving bee keeping experts. At the end of the training 18 bee boxes with bee colonies (*Apis cerana*) were given to the participants in November 2020. Within two years the honey production was recorded about 81 Kg. Village people sold the surplus

pure organic honey (@ Rs. 1000/Kg) other than their own use, and the total honey produced was computed worth Rs. 81,000 in one year (Table 27). Some of the beneficiaries HH have also multiplied the bee colonies. Mr. Manoj Upadhyay resident of village Kaneli has now 12 bee boxes procured from State Govt. scheme with his own contribution and has now resorted to bee-keeping as a business.

**Table 27: Details of beneficiary of bee keeping and benefits accrued**

Name of the village	No. of beneficiary HH	Category BPL/SC/COVID/Gen	Honey production (Kg)	Income generated (Rs.)
Jyoli	05	Gen	09	9000
Khadkuna	04	Gen	01	1000
Kujyari	10	Gen	36	36000
Dilkote	02	BPL/SC/COVID/Gen	05	5000
Bisra	03	Gen	21	21000
Kaneli	01	Gen	09	9000
<b>Total / Mean</b>	<b>25</b>		<b>81</b>	<b>81,000</b>



### Pollination services of honey bees

Among various types of ecosystem services, pollination is regarded as regulating service which is crucial for food production, human livelihoods and diversity of life on earth. About 15% of the world crops are pollinated by managed species of honey bees, bumble bees and solitary bees (Nabhan and Buchmann, 1997). In terms of production, 35% of global food production comes from pollinator dependent crops. Besides yield increment, pollination is also reported to significantly improve the quality of seeds (Free, 1993). Yield of entomophilous crops like mustard, fruits, fibers, condiments and spices and vegetables are directly benefitted by insect pollination. Pratap et al. (2012) estimated annual economic value of pollination service provided by insect pollinators to Uttarakhand state at 166.79 million USD. Several factors such as decline in wilderness and loss of habitat, land use changes, monoculture-dominated agriculture and excessive and indiscriminate use of agricultural chemicals and pesticides have contributed in decline in pollinator population and diversity (Abrol, 2012).

To demonstrate the effect of pollination services of honey bees on quality and yield of selected crops mustard (*Brassica campestris*), buckwheat

(*Fagopyrum esculentum*) and plum (*Prunus domestica*) in Jyoli village cluster, we used pollination exclusion on flowers of target crops by covering these crops with nylon mesh (0.5 mm size) between November 2021 and September 2022 (Table 28). Pollination exclusion (CP) negatively impacted yield variables in all the target crops contrary to the open pollination (OP). The yield of mustard was higher by 26.8% per ha (227 Kg/ha vs. 179 Kg/ha) in OP than the CP (Table 29). Similar results were found in buckwheat where insect pollination resulted into increased per ha yield by nearly 3.7 times as compared to pollination exclusion treatment. In case of plum crop also OP resulted into increase in total number of fruits per branch, percentage of healthy fruits, and test weight of 10 fresh fruits and total yield per branch (0.92 vs. 2.52 Kg; 270% increase). Among the sampled crops maximum pollinator species diversity was recorded in buckwheat (16 spp.) followed by mustard (15 spp.) and plum (13 spp.). In all the target crops honey bees emerged as the most abundant visitors and hence are likely to be key pollinator for these crops followed by wild bees, wasps, syrphids and others. The findings indicate that keeping bee hive in the same parcel of land where crop is growing could increase the crop yield significantly apart from honey production and income generation through its sale.

**Table 28: General characteristics of target crops**

Parameters	Mustard ( <i>Brassica campestris</i> )	Plum ( <i>Prunus domestica</i> )	Buckwheat ( <i>Fagopyrum esculentum</i> )
Variety	Local	Santa Rosa	VL7
Date of sowing	15-11-2021	Age of trees: 8 years	3 June 2022
Date of germination	01-12-2021	-	8 June 2022
Flowering period	26-1 to 28-2-2002 (34 days)	2-11 March 2022 (9 days)	3 July-4 August 2002 (33 days)
Date of harvesting	22-3-2022	20-5-2022	6-09-2022
Crop cycle	127 days	79 days	95 days

**Table 29: Effects of bee pollination on yield of three crops in Jyoli village cluster**

Crop yield parameters	Mustard		Buckwheat		Plum	
	CP	OP	CP	OP	CP	OP
Total number of seed/fruit per plant /per branch	47.4±2.6	64.6±3.8	17.9±0.5	123.4±0.7	50.6±29.0	154.0±69.7
Weight of 1000 grains/seeds (gm)	2.8±0.4	3.6±0.3	22.3±0.2	27.5±0.4	-	-
Weight of 10 fresh fruits (gm)	-	-	-	-	173.0±16.8	180.0±22.1
Yield (Q/ha)	179	227	309	1141	-	-
Fruit yield/branch (Kg)	-	-	-	-	0.92±0.5	2.52±0.6

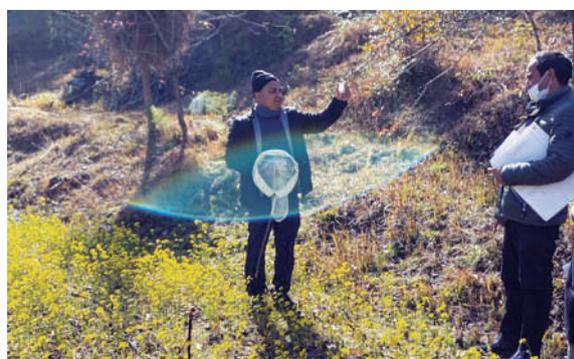


## Honey bee keeping activities in Jyoli village cluster





## Honey bee keeping and pollination services activities in Jyoli village cluster



### Wasteland plantation for fodder and fuel wood

A plantation programme was undertaken at Jyoli village in approximately 1.5 ha land in July 2020. This plantation envisages addressing the ecological rehabilitation of degraded lands and enhancement of livelihood of rural population living around the degraded land. Over 300 saplings of five MPTs were planted by the Jyoli village cluster people under technical guidance of project team. The species were Oak (*Quercus leucotrichophora*, 100 saplings), *Alnus nepalensis* (50 saplings), *Cinnamum tamala* (50 saplings), *Toona ciliata* (50 saplings) and *Salix alba* (60 saplings). Pits 2-3 times larger than the

root balls of nursery polybags were dug and FYM was applied @ 2 Kg per pit. The saplings were designated to the pits based on their survival needs. For example *Alnus* and *Salix* are moisture loving so they were planted near the ravine at the lowest part of the slope of this site. *Toona* and *Quercus* are more resilient towards drought conditions and fire events so they were planted at the top ridge where watering was difficult as some fire events had taken place earlier in the adjacent areas. *Cinnamum tamala* was planted in the mid-portion of the slope for harvesting its commercially important leaves and bark in future. The survival of species and the



stand development was monitored at quarterly intervals though data collection at proper times was impacted due to COVID 19 pandemic. The height and diameter of the saplings was determined using a measuring tape. The survival count was conducted by selecting randomly three replicate plots of 10m x 10m and counting the living saplings species wise.

Table 30 shows the economic importance of the species planted and their survival percentage and stand growth after 3 months. The whole plantation was destroyed due to fire events in summer of 2021. The survival percentage of saplings and mean annual increment in their height and collar diameter were recorded in March 2022. It was observed that *Quercus* species was most affected after the fire event and it was also lopped at sapling stage so the survival rate went down and also its growth rate. The maximum survival rate was observed for

*Toona ciliata* (78%), *Salix alba* (75%) and *Cinnamum tamala* (72%), which were planted near the ravine and were least affected by fire event as fire did not spread to the place due to moist soil. *Alnus nepalensis* was found to be the most fast growing species with 80% increment in collar diameter and 70% survival. In terms of survival percentage of the species the ranking of suitability of species was: *Toona ciliata*> *Salix alba*>*Cinnamum tamala*> *Alnus nepalensis*>*Quercus leucotrichophora*. The mean plant height growth after three months was found ranging from 32-38 cm across the species. Different tree species show different growth increment due to internal factors like genetics and physiology while external factors like climate, edaphic and biotic and abiotic stress play a role in growth of saplings in a rehabilitated land. Tree growth and survival parameters are being monitored by us periodically.

**Table 30: Economic importance and survival and growth after three months and mean annual increment in plant height and collar diameter of planted saplings**

Species	Uses	Survival after 3 months of plantation (%)	Plant height after 3 months of plantation (cm)	Collar diameter after 3 months plantation (mm)	Survival after 18 months (%)	Mean annual increment in plant height (%)	Mean annual increment in collar diameter (%)
<i>Quercus leucotrichophora</i>	Fodder, fuel wood, soil conservation	70	32	2.5	63	6.3	4.0
<i>Alnus nepalensis</i>	Nitrogen fixation, soil conservation, construction poles, fuel wood	73	35	2.0	70	8.6	80.0
<i>Cinnamum tamala</i>	Medicinal, spice, soil conservation	75	34	3.2	72	32.4	31.3
<i>Toona ciliata</i>	Timber, Poles for construction, soil conservation	80	45	2.8	78	11.1	39.3
<i>Salix alba</i>	Cricket bat, poles for construction, soil conservation	79	38	2.2	75	26.3	63.6



## Wasteland development activities in Jyoli village cluster



### Bio-briquette preparation

As elsewhere, in this village cluster Chir-Pine forests grow abundantly that spread over 60 ha area and produces around 150 t of Pine needles (Pirul) annually during summer that is fallen on the forest floor. The pirul being inflammable, is a big menace for forest fire and causes huge loss to forest wealth and biodiversity every year during summer, and sometimes in winter. Bio-briquetting is a process of converting low bulk density mass (dry pine needles) into high density and energy concentrated fuel bio-briquettes. Pirul is collected from the forests during summer (April-June)

and air dried for 3-5 days for removing moisture and then carbonized. Thus, in the absence of air (anaerobic condition) the pirul burns slowly and about 30% carbonized char (by weight of Pirul) is obtained. The carbonized char is then mixed with sieved soil (clay as a binding material) by adding water in the ratio of 8 (char): 2 (clay). Eventually this charcoal mixture is made into bio-briquettes using a specially designed iron mould to form compact and uniform size briquettes. These briquettes are sun-dried for a few days and stored for use. In the village cluster we organized six hands-on trainings on bio-briquette preparation and a few



HH adopted this practice and prepared 1000 such bio-briquettes. They used them and even sold 100 of them for 1000 Rs. and found these bio-briquette quite useful for their cooking/heating purposes. This year many of the HH have collected Pirul

and stored it for bio-briquette preparation during winter 2022. This practice has thus contributed to the reduction in women drudgery, loss of forests and biodiversity and smokeless atmosphere of HH and health benefits to women.

### Bio-briquetting activities in Jyoli village cluster





### Roof-top rain water harvesting

Roof-top rainwater harvesting collects water from the roof of the houses made up of slates, through a system of horizontal channels and vertical down-take pipes and carries it to a closed tank for use by the HH. Water is stored close to the house and can be used for domestic consumption such as irrigating kitchen gardens, washing clothes and utensils, meet livestock drinking and cleaning demand, cleaning washrooms and toilets and even for drinking after boiling/filtering. We demonstrated roof top rain water harvesting in two HH in the village cluster.

In 2022 the total water stored was measured 9840 litre (Table 31), which was mostly used in domestic use indicating that labour spent by women to collect water from distant sources was significantly saved thus reduced women drudgery in the targeted HH. Storing water during summer (as much as 1000 litre on 23.5.2022 in summer season) has been a great help to the kitchen garden vegetable crops in terms of life saving water. Thus, this activity of roof top water harvesting not only contributed to climate change resilience but also to HH sanitation and livestock use.

**Table 31: Rain water harvesting in Dilkote village of Jyoli cluster**

Date of rainfall	Duration (hour)	Total water stored (Lit.)	Water utilized (Lit.)		
			Irrigation (polyhouse and kitchen garden)	Domestic use (sanitation, cloth/utensil and floor washing)	Use for livestock (Drinking, bathing and space cleaning)
8/5/2022	1.0	200	100	50	50
9/5/2022	0.5	100	-	50	50
17/5/2022	1.0	150	50	50	50
18/5/2022	0.5	50	-	50	20
22/5/2022	1.0	200	-	50	50
23/5/2022	3.0	1000	50	50	50
24/5/2022	1.5	200	250	500	300
18/6/2022	3.0	500	-	50	50
19/6/2022	3.5	800	130	50	50
20/6/2022	1.0	100	-	50	50
21/6/2022	1.0	150	300	200	300
29/6/22	1.0	50	-	100	70
3/7/2022	1.0	45	-	50	20
5/7/2022	0.5	45	30	60	30
14/8/2022	4.0	700	200	100	100
15/8/2022	3.0	500	100	300	100
19/8/2022	6.0	1000	300	100	50
28/8/2022	3.0	400	250	250	100
5/9/2022	0.5	200	200	80	150
16/9/2022	1.0	250	150	120	130
17/9/2022	1.5	300	230	210	150
18/9/2022	2.0	200	180	180	200
23/9/2022	8.0	1000	150	120	250
24/9/2022	3.0	400	100	150	180
9/10/2022	6.0	900	-	100	50
10/10/2022	5.0	200	50	80	60
11/10/2022	4.0	200	-	50	80
<b>Total</b>	<b>66.5</b>	<b>9840</b>	<b>2820</b>	<b>3200</b>	<b>2740</b>



## Roof-top water harvesting in Jyoli village cluster



### Use of Pine needles in making check dams for soil and water conservation

In Uttarakhand, soil erosion from the fragile hill slopes under the influence of high intensity monsoon rainfall is a big problem that incurs heavy environmental cost. It not only washes away the fertile top soil but also depletes the water sources and siltation of water bodies down slopes. To address this issue the Forest Dept. of Uttarakhand devised a Pine needle (Pirul) based check dam technology (Chandran & Rawat, 2009). This technology uses the Pirul, which is an inflammable fuel for igniting forest fires. It decomposes slowly and forms a thick layer preventing germination of seeds of other species. They are also slippery causing difficulty for easy passage of domestic and wild animals and village people on hilly paths. Pirul is used for making check dams by packing the dry needles tightly into woven coir nets and rolled into logs of appropriate length and then plugged on to eroding streams and gullies and reinforced with cuttings of easy-to-sprout vegetation. These Pine needle check dams have advantages like slowing

down the flow of water in the streams resulting in reduction in damage downstream and ground water recharge, trapping of soil and seeds of vegetation and facilitating their germination within the gullies, revival of surrounding vegetation due to soil moisture storage etc. This check dam is cost-efficient and environment-friendly compared to traditional stone check dams and gabion structures. The average cost of installation of an average check dam of 2-3 m length and 50 cm diameter varies from US\$ 4 to 16 depending on the availability of pine needles at site and the difficulty of terrain. This activity has a potential to create employment for villagers, especially women and providing solve to reduce the likelihood of forest fire. We replicated this technology in Jyoli village (Distt. Almora) in 2020. Ten such Pirul check dams were built in a seasonal stream of Sivaigair (Khaidhar tok) that was causing soil erosion and found it effective in accumulation and trapping of soil being eroded from the hill slopes (1177 ton soil) and increase in the water yield of a water source on the channel that we utilized to irrigate the adjacent plantation.



### Pine needles check dams for soil and water conservation



### Green skilling of the village cluster women

As mentioned earlier due to the limited resources only a few HH could be adopted under this project for setting up of the livelihood promoting R&D

based interventions. Green skill development for preparation of Rakhi using Pine bark, needles and cones and local folk art (Aipan) was undertaken by a group of women in the village cluster. To begin this

### Green skill development activities (Aipan & Rakhi making) in Jyoli village cluster





activity a few training workshops were organized inviting resource persons. In this activity 32 women and 3 males were involved and they prepared 675 Rakhis before Raksha Bandhan festival and sold them in the nearby market and 'NIHE' campus for Rs. 6950. Some of the Rakhis were gifted by these women to our brave soldiers of Kumaun Regimental Centre, Ranikhet. Traditional folk art Aipan painting

were made by the women groups. Some of the Aipan paintings were sold during 2020-21 and earned a net profit of Rs. 6,200. Aipan made by these women groups are also used as souvenir items to the dignitaries visiting our Institute on several events thus encouraging the local women groups for this local folk art activities and also contributed to their income.



### DOUBLING FARMER'S INCOME IN TWO YEARS

From the foregoing it's evident that a total of 62 HH were directly benefitted through various interventions made by us in different villages of the Jyoli village cluster (Table 32). Poultry was the most preferred activity followed by vegetable cultivation in polyhouse and bee keeping. It may be mentioned that traditionally poultry is an established activity and people find it easy to adopt as birds forage in open and eggs and birds have a readymade market even within the villages. Polyhouse/ protected cultivation is gaining momentum for a decade now in this region and has been found quite promising for growing seasonal/off-season vegetables by escaping from frost, trapping warmth of the solar insulation and more particularly avoids the damage caused by wildlife. In this village cluster we introduced the polyhouses for the first time in Kaneli-Bisra Gram Panchayat. During 2016-2020 in one project of CSED total of 34 polyhouses were installed in the Jyoli village. It may be mentioned that

through our project activities a total of 90 HH (General, SC and COVID returnee) were benefitted, however, the direct benefits were accrued to 62 HH.

Thus it can be concluded that our R&D based interventions increased the income of 62 HH by a mean value of Rs. 28,935.0 per HH in September 2022 end (cumulative increase over two years after our interventions in September 2020) over a baseline value of Rs. 13,134.0 in mid-2020 generated from their traditional farming before our interventions (Annexure X). Thus, we could able to raise the farmers income by over two times, in less than two years period and achieved the vision of Doubling Farmer's Income of Govt. of India. During the two years period of our project we spent Rs. 4,61,220.00 in different activities, and a total output of Rs. 9,76,600.0 was accrued from different livelihood supporting activities thus registering a net profit of Rs.6,67,230.0 (Table 32).

**Table 32: ईको-स्मार्ट आदर्श ग्राम समूह ज्योली में पर्यावरण संस्थान, कोसी द्वारा किये गये परियोजना कार्य (Sept. 2020 – Sept. 2022)**

परियोजना कार्य	ज्योली	खड़कूना	कनेली	बिसरा	कुज्याड़ी	दिलकोट	कुल परिवार	परियोजना क्रियान्वयन से पूर्व आय (₹0)	परियोजना कार्य से कुल आय (₹0)	कुल खर्च (₹0)	शुद्ध लाभ (₹)
पॉलीहाउस	26	—	14	06	18	03	66	482300	373692	93000	280692
मुर्गी पालन	22	—	10	06	29	18	85	105600	470008	104070	365938
मौन पालन	02	01	01	03	10	02	19	131000	81000	117000	—
पीरूल का कोयला	—	—	07	06	16	01	30	96100	5000	4800	200
केंचुआ खाद	—	—	02	01	03	01	07	28000	25000	70000	—
हरित कौशल (ऐपण/राखी)	08	04	04	05	01	03	19	—	21900	1500	20400
उद्यानीकरण	—	—	01	03	—	—	04	7700	—	14850	—
वृक्षारोपण	1.5 हे0	—	—	—	—	—	—	—	—	20000	330 पेड़
पीरूल चैकडैम	10	—	—	—	—	—	—	—	—	15000	1177 टन मृदा संरक्षण
छत के वर्षा जल का एकत्रण	—	—	—	—	—	01	01	—	—	21000	9840 ली0 जल एकत्रण
<b>कुल योग</b>	<b>58</b>	<b>05</b>	<b>38</b>	<b>30</b>	<b>77</b>	<b>29</b>	<b>237</b>	<b>850700</b>	<b>976600</b>	<b>461220</b>	<b>667230</b>



### Societal impact of the project

The societal impact of the R&D interventions in the Jyoli village cluster was studied through a pre-and-post questionnaire analysis in September 2022. The target group was marginalised women, weaker section beneficiaries and the SC/BPL stakeholders selected randomly for this survey. Analysis of the results indicated that significant positive changes in personal attributes occurred after implementation of our project activities (Table 33). The livelihood options implemented through our project has been instrumental for earning income as 71% of the respondents reported that their economic status has improved substantially, which has resulted in increased purchasing power (56%) and living

standard of their family (71%). They acknowledged that round-the-year employment and earning has also increased their self-confidence and their participation in village level meetings has also increased (73%) that has ensured their voice in decision making (44%) in community meetings. A significant change felt by over 40% respondents that the project outcome has been able to reduce migration of the beneficiaries HH to earn livelihood to some extent. **These social impacts can be taken into consideration having positive influence on the stakeholders in Jyoli village cluster, which will eventually lead to the socio-economic development and enhanced quality of life of the people.**

**Table 33: Societal impacts of project R&D interventions on stakeholders in Jyoli village cluster**

Societal impact attributes	Respondents (%) (n= 40)	
	Yes	No
Privilege for spending money earned through livelihood supporting activities	85.4	14.6
Self-use of the money	95.1	4.9
Increase in purchasing power	56.1	43.9
Increase in decision making power for household level matters	63.4	36.6
Increased participation in village level meetings	73.2	26.8
Increase in decision making power for village level matters	43.9	56.1
Increase in self-confidence	73.2	26.8
Change in standard of living	70.7	29.3
Change in economic status of HH	70.7	29.3
Reduced migration to earn livelihood	42.9	57.1





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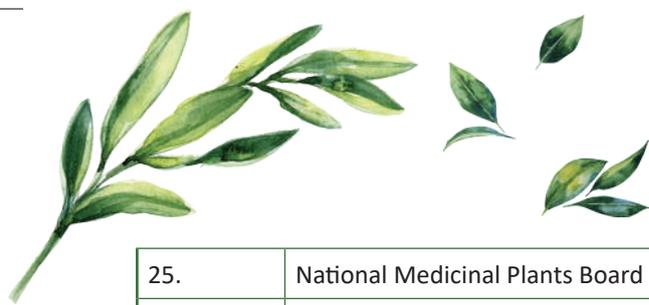
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## Annexure I: Major schemes of Govt. of India in the Himalayan states for rural development, livelihood enhancement and management of natural resources

S. No.	Name of Scheme	Ministry/Department
1.	National Livelihood Mission	Ministry of Rural Development
2.	Biodiversity Conservation and Rural Livelihood Improvement Project	Ministry of Forest, Environment and Climate Change
3.	Central Sector Integrated Scheme on Agricultural Cooperation	Department of Agriculture, Cooperation and Farmers Welfare
4.	Clean Technology and Waste Reduction Strategies	Ministry of Forest, Environment and Climate Change
5.	Dairy Udhmita Development Scheme	Department of Animal Husbandry Dairy and Fisheries
6.	Deendayal Upadhyaya Grameen Kaushalya Yojana	Ministry of Rural Development
7.	Environmental Education Training Scheme	Ministry of Forest, Environment and Climate Change
8.	Infrastructure Development and Capacity Building – MSME, Cluster Development Programme	Ministry of Small and Cottage Industries
9.	Intensive Forest Management	Ministry of Forest, Environment and Climate Change
10.	Integrated Scheme on Agricultural Marketing	Ministry of Agriculture and Farmers' Welfare
11.	Joint Forest Management	Ministry of Forest, Environment and Climate Change
12.	Mahatma Gandhi National rural Employment Guarantee Scheme	Ministry of Rural Development
13.	NTFP and MFP. Marketing of products, Van Dhan vikas Karyakram	Ministry of Scheduled Tribes Affairs
14.	Marketing Assistance Scheme by National Small Industries Corporation Limited	Ministry of Micro Small and Medium Enterprises.
15.	Mechanism for Marketing of Minor Forest Produce Through Minimum Support Price and MFP Development of Value Chain	Ministry of Scheduled Tribes Affairs
16.	Integrated Horticulture Development Mission	Ministry of Agriculture and Farmers' Welfare
17.	Multi-Sectoral Development Programme	Ministry of Minority Affairs
18.	National Livestock Mission	Department of Animal Husbandry, Dairy and Fisheries
19.	National Programme for Dairy Development	Department of Agriculture, Cooperation and Farmers Welfare
20.	National food Security Mission	Ministry of Agriculture and Farmers' Welfare
21.	National Mission for Sustainable Agriculture Development (a) Traditional Agriculture Development Scheme (b) Soil Health Card and Soil Health Management Plan (c) Rain fed Development (d) Pradhan Mantri Krishi Sinchayee Youjan-Per Drop more crop (e) Sub Mission on agro Forestry.	Department of Agriculture, Cooperation and Farmers Welfare
22.	National Mission on Agricultural Extension and Technology	Ministry of Agriculture and Farmers' Welfare
23.	National Fisheries Development Board	Department of Animal Husbandry Dairy and Fisheries
24.	National Ayush Mission	Ministry of AYUSH



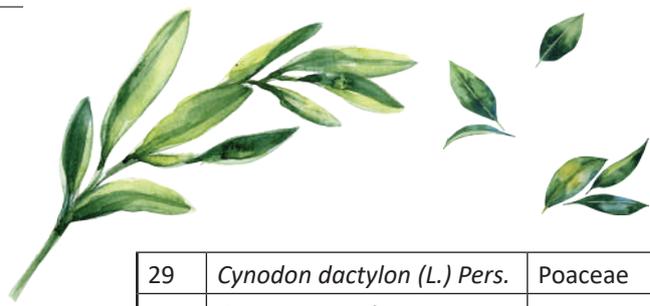
25.	National Medicinal Plants Board	Ministry of AYUSH
26.	National Water Mission	Ministry of Water Resources
27.	National Mission on Oilseeds	Ministry of Agriculture and Farmers' Welfare
28.	National Mission on Himalayan Studies	Ministry of Forest, Environment and Climate Change
29.	National E Governance Schemae	Department of Agriculture, Cooperation and Farmers Welfare
30.	Organic farming in North East Region	Ministry of Development of North Eastern Region
31.	Pradhan Mantri Fasal Bima Yojana	Department of Agriculture, Cooperation and Farmers Welfare
32.	Paramparagat Krishi Vikas Yojana	Ministry of Agriculture and Farmers' Welfare
33.	Pradhan Mantri Employment Generation Programme	Ministry of Micro, Small and Medium Enterprises
34.	Publicity Service Institute and Business related Excellence Assistance and Development Programme for women	Ministry of Micro, Small and Medium Enterprises
35.	Protection of Plant Varieties and Farmers Rights Authority	Ministry of Agriculture and Farmers Welfare
36.	India Rashtriya Krishi Vikas Yojana	Ministry of Agriculture and Farmers' Welfare
37.	Sub Mission on Seeds and Planting Material	Ministry of Agriculture and Farmers' Welfare
38.	Sub Mission on Plant Protection and Plant Quarantine Technology	Plant Protection Directorate Quarantine & Bhandara
39.	Socio Economic Development Program Science and Technology.	Ministry of Science & Technology
40.	Scheme for Leadership Development of Minority Women.	Ministry of Minority Affairs
41.	Special Central Assistance Scheme for Scheduled Castes	Ministry of Social Justice and Empowerment
42.	Assistance for Employment and Training.	Ministry of Child and Women Welfare
43.	Technical support and Capacity Building to the youth of North Eastern Region.	Ministry of Development of North Eastern Region
44.	Up gradation of skills and training in traditional art/ crafts for development.	Ministry of Minority Affairs
45.	Village Entrepreneurship Startup Program.	Ministry of Rural Development





## Annexure II: Flora of Jyoli village cluster

S. No.	Species name	Family	Life form	Medicinal properties	Habitat		
					Van panchayat/ Reserve Forest	Agricultural land	Barren/ Grazing land
1	<i>Ageratum conyzoides</i> L.	Asteraceae	H	+	+	+	+
2	<i>Agrostis alba</i> L.	Poaceae	H	-			+
3	<i>Ainsliaea aptera</i> DC.	Asteraceae	H	+	+		
4	<i>Ajuga bracteosa</i> Wall. ex Benth.	Lamiaceae	H	+	+	+	+
5	<i>Ajuga parviflora</i> Benth.	Lamiaceae	H	+	+	+	+
6	<i>Anaphalis adnata</i> DC.	Asteraceae	H	-	+	+	
7	<i>Anaphalis margaritacea</i> (L.) Benth. & Hook. f.	Asteraceae	H	+	+		
8	<i>Anaphalis triplinervis</i> (Sims) C.B. Clarke	Asteraceae	H	-	+		
9	<i>Andropogon intermedius</i> R. Br.	Poaceae	H	-			+
10	<i>Arisaema intermedium</i> Blume	Araceae	H	-	+	+	+
11	<i>Aster thomsonii</i> C.B. Clarke	Asteraceae	H	+		+	
12	<i>Atylosia scarabaeoides</i> (L.) Benth.	Fabaceae	H	→+		+	
13	<i>Bidens pilosa</i> L.	Asteraceae	H	+	+	+	+
14	<i>Blumea mollis</i> (D. Don) Merr.	Asteraceae	H	+		+	+
15	<i>Blumea axillaris</i> (Lam.) DC.	Asteraceae	H	-		+	+
16	<i>Boenninghausenia albiflora</i> (Hook.) Rchb. ex Meisn.	Rutaceae	H	+	+		+
17	<i>Cajanus scarabaeoides</i> (L.) Thouars	Fabaceae	H	+		+	
18	<i>Cannabis sativa</i> L.	Cannabaceae	H	+	+		
19	<i>Capsella bursa-pastoris</i> (L.) Medik.	Brassicaceae	H	+	+		+
20	<i>Carex cruciata</i> Wahlenb.	Cyperaceae	H	-	+	+	+
21	<i>Carex ligulata</i> Nees	Cyperaceae	H	-			+
22	<i>Cassia tora</i> L.	Fabaceae	H	+	+	+	
23	<i>Chrysopogon</i> sp.	Poaceae	H	+	+		
24	<i>Clinopodium umbrosum</i> (M. Bieb.) K. Koch	Lamiaceae	H	+		+	
25	<i>Cnicus arvensis</i> (L.) Roth	Asteraceae	H	+	+	+	
26	<i>Colebrookea oppositifolia</i> Sm.	Lamiaceae	H	+	+	+	+
27	<i>Conyza aegyptiaca</i> (L.) Aiton	Asteraceae	H	+	+	+	
28	<i>Conyza japonica</i> (Thunb.) Less.	Asteraceae	H	+	+		+



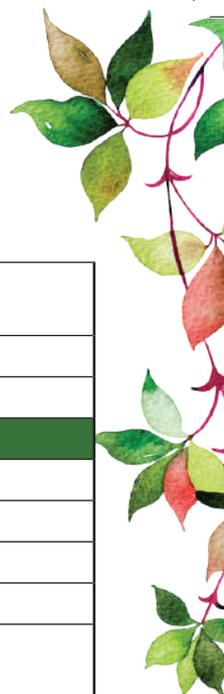
29	<i>Cynodon dactylon</i> (L.) Pers.	Poaceae	H	+	+	+	+
30	<i>Cynoglossum furcatum</i> Wall.	Boraginaceae	H	+		+	
31	<i>Cynoglossum wallichii</i> G. Don	Boraginaceae	H	+	+	+	+
32	<i>Desmodium gangeticum</i> (L.) DC.	Fabaceae	H	+	+	+	+
33	<i>Echinops echinatus</i> Roxb.	Asteraceae	H	+	+		+
34	<i>Emilia sonchifolia</i> (L.) DC.	Asteraceae	H	+		+	
35	<i>Erigeron karvinskianus</i> DC.	Asteraceae	H	+		+	
36	<i>Eriophorum comosum</i> (Wall.) Nees	Cyperaceae	H	+			+
37	<i>Euphorbia hirta</i> L.	Euphorbiaceae	H	+	+		+
38	<i>Euphorbia parviflora</i> L.	Euphorbiaceae	H	+	+	+	+
39	<i>Euphorbia prolifera</i> Buch.-Ham. ex D. Don	Euphorbiaceae	H	+	+	+	+
40	<i>Galinsoga parviflora</i> Cav.	Asteraceae	H	+			+
41	<i>Galinsoga ciliata</i> (Raf.) S.F. Blake	Asteraceae	H	+			+
42	<i>Galinsoga parviflora</i> Cav.	Asteraceae	H	+			+
43	<i>Galium aparine</i> L.	Rubiaceae	H	+	+	+	+
44	<i>Galium elegans</i> Wall.	Rubiaceae	H	+	+		
45	<i>Geranium ocellatum</i> Cambess.	Geraniaceae	H	+	+	+	+
46	<i>Gynura sarcobasis</i> DC.	Asteraceae	H	+		+	
47	<i>Indigofera linifolia</i> (L. f.) Retz.	Fabaceae	H	+		+	
48	<i>Ipomoea purpurea</i> (L.) Roth	Convolvulaceae	H	+	+		
49	<i>Justicia simplex</i> D. Don	Acanthaceae	H	+	+		+
50	<i>Leucas lanata</i> Benth.	Lamiaceae	H	+		+	+
51	<i>Mazus pumilus</i> (Burm. f.) Steenis	Mazaceae	H	+	+		
52	<i>Micromeria biflora</i> (Buch.-Ham. ex D. Don) Benth.	Lamiaceae	H	+	+		
53	<i>Nicandra physalodes</i> (L.) Gaertn.	Solanaceae	H	+		+	
54	<i>Origanum vulgare</i> L.	Lamiaceae	H	+		+	
55	<i>Oxalis corniculata</i> L.	Oxalidaceae	H	+	+	+	+
56	<i>Oxalis latifolia</i> Kunth	Oxalidaceae	H	+	+		+
57	<i>Panicum crus-galli</i> L.	Poaceae	H	+			+
58	<i>Parthenium hysterophorus</i> L.	Asteraceae	H	+		+	
59	<i>Persicaria capitata</i> (Buch.-Ham. ex D. Don) H. Gross	Polygonaceae	H	+	+	+	
60	<i>Poa annua</i> L.	Poaceae	H	+			+
61	<i>Polygonum capitatum</i> Buch.-Ham. ex D. Don	Polygonaceae	H	+	+		
62	<i>Potentilla sundaica</i> (Blume) Kuntze	Rosaceae	H	+	+		



63	<i>Roscoea procera</i> Wall.	Zingiberaceae	H	+		+	+
64	<i>Rubia cordifolia</i> L.	Rubiaceae	H	+	+		
65	<i>Rumex hastatus</i> D. Don	Polygonaceae	H	+	+	+	+
66	<i>Rumex nepalensis</i> Spreng.	Polygonaceae	H	+		+	+
67	<i>Saccharum spontaneum</i> L.	Poaceae	H	+		+	+
68	<i>Satureja biflora</i> (Buch.-Ham. ex D. Don) Briq.	Lamiaceae	H	+	+		
69	<i>Senecio nudicaulis</i> Buch.-Ham. ex D. Don	Asteraceae	H	+	+		+
70	<i>Setaria glauca</i> (L.) P. Beauv.	Poaceae	H	+		+	+
71	<i>Setaria italica</i> (L.) P. Beauv.	Poaceae	H	+	+		
72	<i>Solanum nigrum</i> L.	Solanaceae	H	+	+	+	
73	<i>Solanum virginianum</i> L.	Solanaceae	H	+		+	
74	<i>Solidago canadensis</i> L.	Asteraceae	H	+		+	
75	<i>Sporobolus diander</i> (Retz.) P. Beauv.	Poaceae	H	+	+		+
76	<i>Stellaria media</i> (L.) Vill.	Caryophyllaceae	H	+		+	
77	<i>Tagetes minuta</i> L.	Asteraceae	H	+		+	
78	<i>Trifolium repens</i> Linn	Fabaceae	H	+	+	+	+
79	<i>Triumfetta bogotensis</i> DC.	Malvaceae	H	+	+		+
80	<i>Triumfetta pilosa</i> Roth	Malvaceae	H	+			+
81	<i>Typhonium diversifolium</i> Wall. ex Schott	Araceae	H	+	+		
82	<i>Urena lobata</i> L.	Malvaceae	H	+	+		
83	<i>Urtica dioica</i> L.	Urticaceae	H	+	+	+	
84	<i>Verbascum thapsus</i> L.	Scrophulariaceae	H	+	+	+	+
85	<i>Vicoa auriculata</i> Cass.	Asteraceae	H	+		+	
86	<i>Viola serpens</i> Wall. ex Ging.	Violaceae	H	+	+	+	+
87	<i>Wahlenbergia gracilis</i> (G. Forst.) A. DC.	Campanulaceae	H	+		+	
88	<i>Zinnia multiflora</i> L	Asteraceae	H	+		+	
<b>SHRUBS</b>							
1	<i>Agave americana</i> L.	Asparagaceae	S	+		+	
2	<i>Ageratina adenophora</i> (Spreng.) R.M. King & H. Rob.	Asteraceae	S	+	+	+	+
3	<i>Artemisia nilagirica</i> (C.B. Clarke) Pamp.	Asteraceae	S	+		+	
4	<i>Artemisia vestita</i> Wall. ex Besser	Asteraceae	S	+		+	
5	<i>Asparagus filicinus</i> Buch.-Ham. ex D. Don	Asparagaceae	S	+	+	+	+
6	<i>Berberis asiatica</i> Roxb. ex DC.	Berberidaceae	S	+	+	+	+
7	<i>Berberis</i> sp.	Berberidaceae	S	+	+		
8	<i>Caryopteris grata</i> (Wall. ex Walp.) Benth. & Hook. f. ex C.B. Clarke	Lamiaceae	S	+	+		



9	<i>Cassia laevigata Willd.</i>	Fabaceae	S	+	+		
10	<i>Clematis grata Wall.</i>	Ranunculaceae	S	+		+	
11	<i>Cotinus coggygia Scop.</i>	Anacardiaceae	S	+	+		+
12	<i>Crotalaria sp.</i>	Fabaceae	S	+	+		
13	<i>Crotalaria calycina Schrank</i>	Fabaceae	S	+	+		
14	<i>Cryptolepis buchananii R. Br. ex Roem. &amp; Schult.</i>	Apocynaceae	S	+		+	
15	<i>Desmodium podocarpum DC.</i>	Fabaceae	S	+	+		
16	<i>Deutzia staminea R. Br. ex Wall.</i>	Saxifragaceae	S	+	+		+
17	<i>Dioscorea bulbifera L.</i>	Dioscoreaceae	S	+	+	+	+
18	<i>Dysphania botrys (L.) Mosyakin&amp;Clemants</i>	Amaranthaceae	S	+	+	+	+
19	<i>Flemingia bracteata (Roxb.) Wight</i>	Fabaceae	S	+	+		
20	<i>Flemingia fruticulosa Wall. ex Benth.</i>	Fabaceae	S	+	+		
21	<i>Flemingia prostrata Roxb.</i>	Fabaceae	S	+		+	
22	<i>Flemingia semialata Roxb.</i>	Fabaceae	S	+	+	+	+
23	<i>Hypericum patulum Thunb.</i>	Hypericaceae	S	+		+	
24	<i>Indigofera tinctoria L.</i>	Fabaceae	S	+	+	+	+
25	<i>Inula cappa (Buch.-Ham. ex D. Don) DC.</i>	Asteraceae	S	+	+		
26	<i>Lagerstroemia indica L.</i>	Lythraceae	S	+		+	+
27	<i>Lantana camara L.</i>	Verbenaceae	S	+		+	+
28	<i>Leptodermis lanceolata Wall.</i>	Rubiaceae	S	+		+	+
29	<i>Melothria sp.</i>	Cucurbitaceae	S	+		+	+
30	<i>Myrsine africana L.</i>	Primulaceae	S	+		+	+
31	<i>Osbeckia stellata Buch.-Ham. ex Ker Gawl.</i>	Melastamataceae	S	+	+		
32	<i>Phyllanthus parvifolius Buch.-Ham. ex D. Don</i>	Phyllanthaceae	S	+	+		
33	<i>Potentilla fulgens Wall. ex Hook.</i>	Rosaceae	S	+			+
34	<i>Potentilla lineata Trevir.</i>	Rosaceae	S	+			+
35	<i>Prinsepia utilis Royle</i>	Rosaceae	S	+		+	
36	<i>Pyracantha crenulata (D. Don) M. Roem.</i>	Rosaceae	S	+	+	+	+
37	<i>Reinwardtia indica Dumort.</i>	Linaceae	S	+		+	
38	<i>Rhus cotinus L.</i>	Anacardiaceae	S	+	+		+
39	<i>Rubus ellipticus Sm</i>	Rosaceae	S	+	+	+	+
40	<i>Stephania rotunda Lour.</i>	Menispermaceae	S	+	+	+	
41	<i>Thalictrum foliolosum DC.</i>	Ranunculaceae	S	+		+	+
42	<i>Vitex negundo L.</i>	Lamiaceae	S	+	+		
43	<i>Vitis lanata Roxb.</i>	Vitaceae	S	+	+		



44	<i>Woodfordia fruticosa</i> (L.) Kurz	Lythraceae	S	+		+	
45	<i>Ziziphus jujuba</i> (L.) Lam.	Rhamnaceae	S	+			+
46	<i>Ziziphus mauritiana</i> Lam.	Rhamnaceae	S	+	+		+
<b>TREES</b>							
1	<i>Alnus nepalensis</i> D. Don	Betulaceae	T	+	+		
2	<i>Azadirachta indica</i> A. Juss.	Meliaceae	T	+			+
3	<i>Bauhinia retusa</i> Poir.	Fabaceae	T	+	+		
4	<i>Bombax ceiba</i> L.	Malvaceae	T	+		+	
5	<i>Cedrus deodara</i> (Roxb. ex D. Don) G. Don	Pinaceae	T	+	+		
6	<i>Celtis australis</i> L.	Cannabaceae	T	+	+	+	
7	<i>Celtis caucasica</i> Willd.	Cannabaceae	T	+		+	
8	<i>Cerasus cerasoides</i> (Buch.-Ham. ex D. Don) S.Y. Sokolov	Rosaceae	T	+	+	+	+
9	<i>Cinnamomum tamala</i> (Buch.-Ham.) T. Nees & Nees	Lauraceae	T	+	+		
10	<i>Cupressus torulosa</i> D. Don ex Lamb.	Cupressaceae	T	+		+	
11	<i>Ficus palmata</i> Forssk.	Moraceae	T	+		+	
12	<i>Ficus roxburghii</i> Steud.	Moraceae	T	+	+	+	
13	<i>Grewia optiva</i> (Buch.-Ham. ex Roxb.) J.R. Drumm. ex Burret	Malvaceae	T	+		+	
14	<i>Mangifera indica</i> L.	Anacardiaceae	T	+		+	
15	<i>Myrica esculenta</i> Buch.-Ham. ex D. Don	Myricaceae	T	+	+		
16	<i>Pinus roxburghii</i> Sarg.	Pinaceae	T	+	+	+	+
17	<i>Prunus cerasoides</i> Buch.-Ham. ex D. Don	Rosaceae	T	+	+		
18	<i>Pyrus pashia</i> Buch.-Ham. ex D. Don	Rosaceae	T	+	+	+	+
19	<i>Quercus glauca</i> Thunb.	Fagaceae	T	+	+		
20	<i>Quercus leucotrichophora</i> A. Camus	Fagaceae	T	+	+		+
21	<i>Quercus serrata</i> Thunb.	Fagaceae	T	+	+		
22	<i>Sapium insigne</i> (Royle) Benth. & Hook. f.	Euphorbiaceae	T	+	+	+	+
23	<i>Toona ciliata</i> M. Roem.	Meliaceae	T	+	+	+	+
24	<i>Triadica sebifera</i> (L.) Small	Euphorbiaceae	T	+	+	+	
25	<i>Zanthoxylum armatum</i> DC.	Rutaceae	T	+		+	

## Annexure III: Unnat Bharat Abhiyan Questionnaire

### उन्नत भारत अभियान-आधारभूत परिवार सर्वेक्षण फार्म (ग्राम खड़कूना के एक परिवार का उदाहरण)

ग्राम:- खड़कूना      ग्राम पंचायत:- ज्योली सिंलिंग  
वार्ड सं०:- 07      विकासखण्ड:- हवालबाग  
जिला:- अल्मोड़ा      राज्य:- उत्तराखण्ड

#### 1. उत्तरदाता का विवरण:-

नाम: सुरेश चन्द्र लोहनी	लिंग:- पुरुष/महिला/अन्य- पुरुष	उम्र (वर्ष): 54
घर के मुखिया से सम्बन्ध:-स्वयं	ग्राम में किस वर्ष से रह रहे हैं- जन्म से	फोन न०: 8958777690

#### 2. परिवार की सामान्य सूचना:-

परिवार के मुखिया का नाम: सुरेश चन्द्र लोहनी	पुरुष✓/महिला	परिवार के सदस्यों की संख्या: 03
श्रेणी: सामान्य✓/अनु०जाति/अनु० जनजाति/पिछड़ा वर्ग	ए.पी.एल/बी.पी.एल.✓	
अपना मकान: हॉ✓/नहीं	मकान का प्रकार: कच्चा✓/कच्चा-पक्का/पक्का	घर से जल निकासी की स्थिति: बन्द/खुला/कुछ नहीं✓
कूड़ा इकट्ठा करने का प्रकार: घर से/सार्वजनिक स्थल/ कूड़ा इकट्ठा करने की व्यवस्था नहीं है✓	खाद का गड्डा: व्यक्तिगत/सामूहिक/नहीं है✓	गोबर गैस: व्यक्तिगत/सामूहिक/सामुदायिक/नहीं है।✓

#### 3. परिवार के सदस्यों का विवरण:-

नाम	उम्र (वर्ष):	पुरुष/महिला/ (क) (1-3)	शिक्षा स्तर (ख) (1-9)	विद्यालय शिक्षा का विवरण (ग) (1-5)	आधार कार्ड (हॉ/नहीं)	बैंक खाता (हॉ/नहीं)	कम्प्यूटर ज्ञान (हॉ/नहीं)	सामाजिक सुरक्षा पेंशन (घ) (1-4)	मुख्य बीमारी का नाम यदि कोई हो	मनरेगा कार्ड (हॉ/नहीं) (च) (1-4)	स्वयं सहायता समूह सदस्य (हॉ/नहीं)	व्यवसाय का प्रकार (ज) (1-12)
सुरेश चन्द्र लोहनी	54	पुरुष	6	5	हॉ	हॉ	नहीं					01
गंगा लोहनी	50	महिला	6	5	हॉ	हॉ	नहीं					08
मोहित लोहनी	20	पुरुष	6	3	हॉ	नहीं	हॉ					

(क) 1-अविवाहित, 2- विवाहित, 3- अन्य (विधवा/तलाकशुदा)

(ख) 1-निरक्षर, 2-साक्षर, 3-कक्षा पाँच, 4-कक्षा आठ, 5-कक्षा 10, 6-कक्षा 12, 7-स्नातक, 8-परास्नातक, 9-व्यावसायिक शिक्षा (डिप्लोमा, डिग्री) का विषय/अन्य

(ग) 1-ऑगनबाड़ी, 2-स्कूल, 3-कालेज, 4-स्कूल नहीं जाते, 5-लागू नहीं

(घ) 0-पेंशन नहीं, 1-विधवा पेंशन, 2-विकलांग पेंशन, 3-अन्य पेंशन (पेंशन का नाम)

(च) 1-सामान्य, 2-अनुसूचित जाति 3-अनुसूचित जनजाति 4-अन्य पिछड़ा वर्ग

(ज) 1-अपनी भूमि में कृषि करते हैं, 2-बटाई में/लीज भूमि में खेती 3-पशुपालन 4-मत्स्य/मुर्गी पालन, 5-कुशल दैनिक मजदूरी, 6-अकुशल दैनिक मजदूरी, 7-सरकारी नौकरी, 8-प्राइवेट नौकरी, 9- कताई-बुनाई, 10-मिस्त्री कार्य, 11-दुकान व व्यवसाय



#### 4. परिवार का प्रवजन विवरण:-

क्या घर का कोई सदस्य घर से दूर काम करते हैं।	हाँ/नहीं✓	प्रवास का कारण: नौकरी, बच्चों की शिक्षा, कृषि भूमि की कमी, स्वास्थ्य कारण, व्यवसाय आदि
यदि हाँ, तो कितने सदस्य घर के बाहर परदेश में रहते हैं।	—	
उक्त सदस्य कितने दिन/महीने प्रतिवर्ष बाहर रहते हैं।	—	
विगत कितने वर्ष से परदेश में रह रहे हैं।	—	

#### 5. सरकारी योजनाओं से लाभ की सूचना

नाम	लाभार्थियों की संख्या
प्रधानमंत्री जनधन योजना	—
सुकन्या समृद्धि योजना	—
मुद्रा योजना	—
प्रधानमंत्री जीवन-ज्योति बीमा योजना	—
प्रधानमंत्री सुरक्षा बीमा योजना	—
अटल पेंशन योजना	—
कौशल विकास योजना	—
जन्नी सुरक्षा योजना	—
मनरेगा से प्रति वर्ष आय (रु०).....	—
फसल बीमा योजना	—
किसान क्रेडिट योजना	—
कृषि सिंचाई योजना	—
स्वच्छ भारत मिशन शौचालय	हाँ
सोईल हेल्थ कार्ड	—
प्रधानमंत्री उज्जवला योजना	हाँ
प्रधानमंत्री आवास योजना	—

#### 6. जल का स्रोत (घर से दूरी मीटर/किमी०)

जल का स्रोत	घर से दूरी	प्रतिदिन जल की औसत खपत (लीटर)
घर में पानी का नल	हाँ✓/नहीं	10 मी. 220 ली.
सामुदायिक नल	हाँ✓/नहीं	150 मी. 60 ली.
हैण्ड पम्प (सार्वजनिक/ व्यक्तिगत)	हाँ✓/नहीं	500 मी.
कुओं (सार्वजनिक/ व्यक्तिगत)	हाँ/नहीं	—
जल का अन्य स्रोत:	नौला	500 मी. 30 ली.
जल एकत्र करने का तरीका (सामुदायिक/व्यक्तिगत)	—	—

#### 7. वन्य खाद्य फल-फूल इत्यादि का उपयोग

वन्य खाद्य फल-फूल का नाम	उपयोग (खाने में/ दवा आदि)	मात्रा/वर्ष (किग्रा०)
—	—	—
—	—	—



### 8. ऊर्जा का स्रोत:

घर में विद्युत कनेक्शन: <b>हाँ✓</b> / नहीं	प्रतिमाह दो माह में बिजली का बिल (रु०)		
प्रतिदिन विद्युत आपूर्ति (घंटे): <b>22</b>	<b>225 रु.</b>		
रोशनी: बिजली/मिट्टी तेल/सौर ऊर्जा	—		
अन्य ऊर्जा स्रोत:			
भोजन बनाने हेतु: एल.पी.जी./बायोगैस/मिट्टी तेल/ <b>लकड़ी✓</b> / गोबर के उपले/कृषि फसल घास/बिजली	<b>लकड़ी</b>		
अन्य ऊर्जा स्रोत:	—		
भोजन बनाने हेतु चूल्हा: सामान्य/धुआँ रहित	<b>सामान्य</b>		
ईंधन हेतु उपकरण का नाम	संख्या	प्रतिदिन इस्तेमाल के घंटे	प्रतिदिन खपत (किग्रा/लीटर)
चूल्हा	<b>01</b>	<b>1 घंटा</b>	<b>8 किलाग्राम</b>
एल.पी.जी.	<b>02</b>	<b>1 घंटा</b>	<b>400 मिली.</b>

### 9. भूमि स्वामित्व का विवरण (नाली में)

1. कुल भूमि	<b>4 नाली</b>	2. कृषि योग्य भूमि	<b>2 नाली</b>
3. सिंचित भूमि	—	4. असिंचित कृषि भूमि	—
5. परती/बंजर भूमि	<b>2 नाली</b>	6. अकृषित भूमि/खेती योग्य बंजर	—

### 10. कृषि कार्य में संसाधनों की खपत

विवरण	कृपया टिक (✓) करें	यदि हों तो खपत (किग्रा०/वर्ष)
रासायनिक खाद	हाँ/नहीं	—
कीटनाशक	हाँ/नहीं	—
खरपतवार नाशक	हाँ/नहीं	—
गोबर की खाद	हाँ/नहीं	<b>200</b>
सिंचाई: नहर/टैंक/बोरवैल/नदी/अन्य/कुछ नहीं		
सिंचाई का तरीका: ड्रिप सिंचाई/स्प्रिंकलर/सिंचाई/नहीं		

### 11. प्राकृतिक/वन सम्पदा पर आधारित जीविकोपार्जन

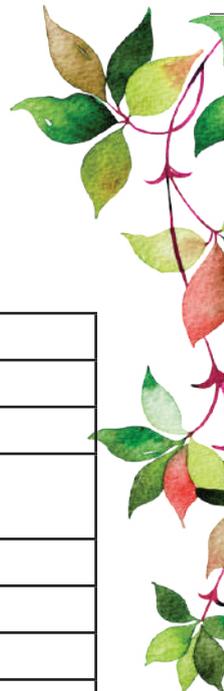
जीविकोपार्जन का प्रकार/विवरण	प्रतिवर्ष कच्चा माल की खपत (किग्रा./ क्विंटल )	प्रतिवर्ष आय (रु०)
—	—	—

### 12. फसलों का उत्पादन सामान्य वर्षों में: (मुख्य फसलें प्राथमिकता के आधार पर)

मुख्य फसल का नाम	विगत वर्ष बोया गया क्षेत्र (नाली)	उत्पादन/नाली (किग्रा०/क्विंटल)
मडुवा एवं भट्ट	<b>2</b>	<b>15 किलोग्राम एवं 0.5 किलोग्राम</b>

### 13. फल/चारा वृक्षों का विवरण एवं आय/वर्ष—

फल के वृक्ष का नाम	संख्या	फल/उत्पादन (किग्रा./वर्ष)	फलों से आय (रु०) /वर्ष	चारा/ ईंधन वृक्ष	संख्या	चारा/ईंधन उत्पादन वर्ष	वृक्षों से आय (रु०/वर्ष)
तिमिल	<b>01</b>	<b>20</b>	स्वयं उपयोग	भीमल एवं खड़िक	<b>2</b> <b>1</b>	<b>200 किलोग्राम 100 किलोग्राम</b>	—



14. पालतू पशुओं की संख्या:

गाय: 1	भैंस:	बकरी/भेड़:
बछड़े:	बैल:	मुर्गी/बतख:
घोड़ा:	सुअर:	अन्य:
पशुओं हेतु आश्रय: (पक्का✓/कच्चा/नहीं है)		प्रतिदिन गोबर आदि का उत्पादन (किग्रा): 8
प्रतिदिन दुग्ध उत्पादन (लीटर):	—	—
पशुओं हेतु चारे की खपत (किग्रा./दिन)	15	हरा/सूखा चारा (किग्रा.)
फसलों की घास (%)	30	चरागाह की घास (%)
जंगल में चराई (घंटे/दिन)	—	जाड़ा.....गर्मी.....बरसात.....

15. परिवार के आय-व्यय के स्रोत

आय का स्रोत (रु०/वर्ष)	रुपया/वर्ष	व्यय की मद (रु०/वर्ष)	रुपया/वर्ष
कृषि	—	शिक्षा	12000
पशुपालन/पशु उत्पाद	—	स्वास्थ्य	8000
मजदूरी/नौकरी	60,000	कृषि लागत (बीज/खाद/मजदूरी)	2000
अन्य व्यवसाय	—	रहन-सहन/घर का रख-रखाव	5000
पेंशन	—	अन्य	10000
परिवार की समस्त स्रोतों से आमदनी (रु०/वर्ष)	60,000	प्रतिवर्ष कुल व्यय (रु०)	37000

16. आपको या आपके परिवार के सदस्य को कोई कौशल प्रशिक्षण की आवश्यकता है, यदि हाँ तो किसे व किस प्रकार की.....  
 .....सिलाई.....एवं उस प्रशिक्षण का कैसे उपयोग करेंगे.....आमदनी के लिए.....  
 .....

17. ग्रामीण विकास एवं पर्यावरण संरक्षण से सम्बन्धित किस कार्य में आपकी रुचि है एवं उक्त कार्य हेतु आप कितना श्रमदान✓/अंशदान (रु०/वर्ष) कर सकते हैं .....पेड़ लगाना 2 घंटा.....

18. ग्राम की तीन प्रमुख समस्यायें

समस्या का नाम	समस्या हल करने एवं विकास हेतु आपका सुझाव
पेयजल	कुशल कर्मचारी की आवश्यकता
रास्ते की समस्या	कुशल कर्मचारी की आवश्यकता

शुभम लोहनी  
 सर्वेक्षण कर्ता का नाम/हस्ताक्षर  
 दिनांक: 20/9/2020  
 मोबाइल न0: 81xxxxx46



## Annexure IV: Chronology of training programs and other events in Jyoli village cluster

Sl. No.	Date	Name of the event	Venue	Participating stakeholders
1.	29/6/2020	Introductory meeting with people's representatives	RTC, GBP-NIHE	Gram Pradhans, Sr. people of Jyoli village cluster (M=5, F=3); Intt. Faculty / Project staff
2.	3/7/2020	Introductory field visit	Jyoli Village Cluster	Village people (M=6, F=4) Gram Pradhans, Jyoli & Kaneli villages) / Intt. Faculty / Project staff
3.	5/7/2020	Inauguration of Project	RTC, GBP-NIHE	Member of Parliament, Almora Hon'ble Ajay Tamta Ji, Director, Intt. Faculty / Project staff GBP-NIHE; Gram Pradhan, Jyoli & Kaneli and people of Jyoli village cluster (M=25, F=13)
4.	16/7/2020	Plantation of broad leaf species (Oak-100, Utish-50, Tejpatta-50, Tun-50, Salix-60)	Sivaigair wasteland site, Jyoli	Village people (M=38, F=28) Gram Pradhan, Jyoli Dr. G.C. Joshi, Retd. Scientist Incharge, CCRAS, and Intt. Faculty / Project staff
5.	23/7/2020	Village meeting for community mobilization	Khadkuna village	Village people (M=13, F=13) Gram Pradhan, Jyoli Intt. Faculty / Project staff
6.	25-27/7/2020	Rakhi making training	Khadkuna village	Village people (M=3, F=17) Intt. Faculty / Project staff
7.	27/07/2020	Exposure visit to RTC / Distribution of fruit trees	RTC, GBP-NIHE	Gram Pradhan, Jyoli; Village people of Khadkuna (M=2, F=14); Intt. Faculty / Project staff
8.	28.7.2020	Meeting with village people for planning project work	Khadkuna village	Khadkuna village people (M=7, F=8); Intt. Faculty / Project staff
9.	29/07/2020	Meeting with people of Kaneli and Bisra village	Panchayat Bhawan, Kaneli village	Mrs. Deepa Upadhyay, Gram Pradhan -Kaneli, Village people (M=17, F=19); Intt. Faculty / Project staff
10.	30/07/2020	Exposure visit to RTC by people / Distribution of fruit trees	RTC, GBP-NIHE	Gram Pradhan, Kaneli, People of Kaneli & Bisra villagers (M=19, F=18); Er. D.C. Bisht, SPARDHA, NGO; Intt. Faculty / Project staff
11.	01/08/2020	Preparation of Pirul check dams (10) at Sivaigair stream in Jyoli	Jyoli village	Gram Pradhan, Jyoji ; Village people (M=8, F=0) Intt. Faculty / Project staff
12.	06/08/2020	Meeting with people of Kujyari & Dilkote villages	Panchayat Bhawan, Kujyari village	Gram Pradhans, Kaneli & Jyoli, BDC Member Jyoli; Village people (M=33, F=5); Intt. Faculty / Project staff
13.	06/08/2020	Survey for poultry farming	Kaneli and Bisra villages	Gram Pradhan, Kaneli ; Village people (M=9, F=6) Intt. Faculty / Project staff
14.	07/08/2020	Exposure visit to RTC / Distribution of Fruit Trees	RTC, GBP-NIHE	Gram Pradhan, Kujyari, People of Kujyari & Dilkotee villages; (M=16, F=31); Intt. Faculty / Project staff
15.	15/8/2020	Project review meeting	RTC, GBP-NIHE	Village people (M=4, F=3); Intt. Faculty / Project staff
16.	18/8/2020	Village survey for poultry farming	Kujyari and Dilkote villages	Gram Pradhan Kujyari ; Village people (M=30, F=2) Intt. Faculty / Project staff
17.	19/8/2020	Jogyura village visit for poultry farming	Jogyura (Kujyari)	Gram Pradhan, Kujyari ; Village people (M=9, F=6) Intt. Faculty / Project staff



18.	21/8/2020	Bee keeping meeting at Kujyari	Kujyari village	Village people (M=5, F=3); Er. D.C. Bisht, SPARDHA , NGO, Mr. Raju Kandpal, Mahila Haat NGO; Intt. Faculty / Project staff
19.	26/8/2020	Distribution of fodder, timber, fiber and fruit trees to farmers	Jyoli and Kujyari villages	Gram Pradhan, Jyoli; Village people (M=58, F=32) Intt. Faculty / Project sta
20.	07/09/2020	Meeting for bee keeping	Kujyari village	Village people (M=12, F=4); Er. D.C. Bisht, SPARDHA , NGO; Mr. Raju Kandpal, Mahila Haat NGO, Intt. Faculty / Project staff
21.	08/9/2020	Change Leader Training	RTC, GBP-NIHE	Change Leaders of Jyoli village cluster (M=6, F=7) Project staff
22.	14/9/2020	Change Leader Workshop	Khadkuna village	Change leaders (M=6, F=7), Intt. Faculty / Project staff
23.	26/8/2020	Distribution of fodder, timber, fibre and fruit trees	Jyoli and Kujyari villages	Gram Pradhan Jyoli & Kujyari, Village people (M=58, F=32), Intt. Faculty / Project staff
24.	29/9/2020	Training workshop "Off season vegetable cultivation, protected cultivation and organic farming"	Kaneli village	Gram Pradhan Kaneli, Village people (M=20, F=6) Polyhouse Expert- Dr. G.P. Pandey, Intt. Faculty / Project staff
25.	29/9/2020	Village survey for Protected cultivation	Kaneli and Bisra villages	Village people (M=4, F=3), Gram Pradhan, Kaneli; Village people (M=20, F=6), Polyhouse Expert- Dr. G.P. Pandey, Intt. Faculty / Project staff
26.	30/9/2020	Training on Protected cultivation, Organic farming and Horticulture	Kujyari & Dilkotee villages	Gram Pradhan, Kujyari, Village people (M=20, F=05) Polyhouse Expert- Dr. G.P. Pande, Intt. Faculty / Project staff
27.	30/9/2020	Village survey for Protected cultivation	Kujyari and Dilkotee villages	Gram Pradhan, Kujyari, Expert- Dr. G.D. Pandey, Village people (M=10, F=6), Intt. Faculty / Project staff
28.	2/10/2020	Swach Bharat Abhiyan at Jyoli Inter College	Jyoli village	Gram Pradhan, Jyoli and Kujyari, Village people (M=19, F=14), College Teachers and students, Er. D.C. Bisht, SPARDHA, NGO, Intt. Faculty / Project staff
29.	07/10/2020	Meeting with CDO, Almora regarding project activities	Almora	Intt. Faculty / Project staff
30.	8/10/2020	Training on Poultry farming	Kujyari & Dilkote	Gram Pradhan Kujyari, Village people (M=13, F=7) Veterinary doctor Intt. Faculty / Project staff
31.	8/10/2020	Distribution of chicks	Kujyari & Dilkote	Gram Pradhan, Kujyari, Veterinary doctor, Village people (M=7, F=7), Intt. Faculty / Project staff
32.	12-13.10.2020 15-16.10.2020 20-21.10.2020	Training on Bio-briquetting sponsored by Livelihood Support project, U.K. Govt.	RTC, GBP-NIHE	Village people (M=6, F=120), Mr. Anand Bhatt training incharge of Training centre, Hawalbag Intt. Faculty / Project staff
33.	14-22.10.2020	Training Workshop on Bee Keeping for Livelihood & Income Generation	Panchayat Bhawan, Kujyari	Hon'ble R.S. Chauhan, Deputy-Speaker, Vidhan Sabha, Uttarakhand (Chief Guest), Gram Pradhans of Jyoli, Kujyari & Kaneli, Expert- Er. Deep Chand Bisht Mr. Manuj Goyal, CDO, Almora, Village people (M=15, F=7), Intt. Faculty / Project staff
34.	22/10/2020	Hands-on-training on Polyhouse construction at village Dilkote	Dilkote village Distribution of chicks at Village-Kujyari, Dilkote	Gram Pradhan, Kujyari, Village people (M=15, F=2) Expert- Dr. G.P. Pandey, Dr. Rakesh Mer, Scientist KVK, Matela Almora, Village people (M=8, F=1), Project staff



35.	26/10/2020	Hands-on-training on Polyhouse construction	Kaneli village	Gram Pradhan, Kaneli,Village people (M=5, F=5). Expert- Dr. G.P. Pandey , Intt. Faculty / Project staff
36.	29/10/2020	Distribution of chicks	Village-Kujyari, Dilkote, Kaneli and Bisra	Village people (M=16, F=8),Intt. Faculty / Project staff
37.	3/11/2020	Distribution of bee boxes with bee colony to the trained bee keeper from Jyoli village cluster	RTC, GBP-NIHE	Gram Pradhan, Kujyari,Village people (M=7) Er. D.C. Bisht, SPRDRA NGO, Intt. Faculty / Project staff
38.	7/11/2020	Seven days training workshop on Aipan (Kumaun folk art)	Jyoli village and RTC	Village people (M=4, F=20),Gram pradhan, Jyoli, Kujyari and Kaneli; Mr. G.C.Pant, DDM NABARD, Almora, Er. D.C. Bisht, SPRDHA NGO.,Intt. Faculty / Project staff
39.	25/11/2020	Training on Bio-briquetting	Kaneli and Bisra village	Village people (M=2, F=11),Gram Pradhan, Kaneli Intt. Faculty / Project staff
40.	3/12/2020	Training on Bio-briquetting	Kujyari and Dilkote village	Gram Pradhan, Kujyari,Village people (M=4, F=15) Intt. Faculty / Project staff
41.	10/12/2020	Farmer orientation program for poultry management and bio- briquetting	Kaneli and Bisra village	Gram Pradhan Kaneli,Village people (M=5, F=15) Intt. Faculty / Project staff
42.	17/12/2020	Training on village resource use mapping for village representatives of Jyoli village cluster	RTC, GBP-NIHE	Gram Pradhan Jyoli, Kujyari and Kaneli ,Mr. Ashutosh Joshi , BDC Member,Village people (M=11, F=6) Intt. Faculty / Project staff
43.	22/12/2020	Training on horticulture associated with bee-keeping	Kaneli village	Gram Pradhan, Kaneli,Village people (M=5, F=4) Expert- Er. D.C. Bisht, SPARDHA, NGO; Intt. Faculty / Project staff
44.	25-27/01/2021	Training and demonstration program on orchard establishment	Kaneli village	Village people (M=16, F=6),Dr.T.N. Pande , District Horticulture Officer, Almora; Dr.K.K. Singh & Dr. Rakesh Mer (KVK, Almora),Intt. Faculty / Project staff
45.	29/01/2021	Briefing and exposure visit to Jyoli-village cluster for project related discussion	Jyoli-village cluster	Scientists and research scholars, GBP-NIHE,Village people (M=6, F=3),Intt. Faculty / Project staff
46.	4/2/2021	Exhibition of RTC products in Exhibition organized by Tourism Deptt.	Katarmal village	Tourism Mnister of Uttarakhand, Hon'ble Satpal Maharaj, D.M. Almora, Village people (M=40, F=20); Intt. Faculty / Project staff
47.	8-11/2/2021	Training workshop for change leaders on resource mapping	Khadkuna village	Gram Pradhan, Jyoli,Change Leaders (M=7, F=8) Intt. Faculty / Project staff
48.	24/2/2021	Training workshop for change leader on resource mapping	Kujyari village	Gram Pradhan, Kujari,Village people (M=3, F=8) Intt. Faculty / Project staff
49.	8/3/2021	International Women day's Day celebration	Jyoli Village Cluster	Village people (M=25, F=0) Intt. Faculty / Project staff
50.	29-30/6/2021	Workshop on traditional folk art Aipan under Bharat ka Amrit Mohotsav	Jyoli village	Gram Pradhan Jyoli,Village people (M=0, F=12) Intt. Faculty / Project staff



52.	29/7/2021	Workshop on data collection for village resource mapping	RTC, GBP-NIHE	Mr. Navneet Pandey, CDO, Almora, Mr. Kandpal, VDO, Hawalbag, Village people (M=20, F=2),Intt. Faculty / Project staff
53.	6/8/2021	Training on Rakhi making (Green skilling)	Khadkuna village	Village people (F=10),Intt. Faculty / Project staff
54.	26/8/2021	Plantation of broad leaf species (Oak-100, Utish-50, Tejpatta-50, Tun-50, Salix-60).	Sivaigair, Jyoli	Gram Pradhan, Jyoli ,Village people (M=18, F=14) Intt. Faculty / Project staff
55.	26/10/2021	Pollination experiment set up in Kaneli Village	Jyoli village	Mr. Manoj Upadhyay, Er.D.C. Bisht, SPARDHA NGO Intt. Faculty / Project staff
56.	6/12/2021	Meeting with people of village Jyoli cluster	Jyoli village	Gram Pradhan Jyoli, Village people (M=19, F=11) Intt. Faculty / Project staff
57.	7/12/2021	Training on Unnat Bharat Abhiyan questionnaire survey	RTC, GBP-NIHE	Village people Bageshwar Distt. (M=20, F=2),Intt. Faculty / Project staff
58.	13/4/2022	J.S. MoEF & CC, visit to Jyoli Village Cluster and RTC	Jyoli village and RTC, GBP-NIHE	JS, MoEF & CC, Govt of India, Gram Pradhans, Jyoli & Kujyari ,Village people (M=12, F=4),Intt. Faculty / Project staff
59.	5/6/2022	World Environment Day celebration	Jyoli village cluster	Village people (M=27, F=15),Intt. Faculty / Project staff
60.	21-22/7/2022	Training on Rakhi making (Green skilling)	Kujyari & Dilkote	Village people (F=40),Intt. Faculty / Project staff
61.	7 to 09-11/2022	Three days training on protected cultivation in hill areas	RTC, GBP-NIHE	Villagers (F-30) ,Intt. Faculty / Project staff
62.	10 to 11/6/2022	Training on Post harvest management and value addition of vegetables, spices and fruit crops	RTC, GBP-NIHE	Villagers (F-30),Dr. S. S. Singh, KVK, Intt. Faculty / Project staff
63.	11 & 13.8.2022	Visit of SAC members to Jyoli village cluster	Jyoli village cluster	Prof. Eklabya Sharma (Chairman- SAC), Prof. R.M. Pant (VC- Assam Univ. Silchar), Director Wadia Intt. of Himalayan Geology, Institute Director; Intt. Faculty / Project staff
64.	3.11.2022	Visit of IERP - PEC Chairman to Jyoli village cluster	Jyoli village cluster	Dr. R.K. Maikhuri (HNBGU),Institute Director Intt. Faculty / Project staff





## Annexure V: Package of practices available at RTC of 'NIHE' Kosi-Katarmal

S. No.	Name of technology
1.	Protected cultivation (Polyhouse, Polypit, Polytrench etc)
2.	Bio-composting
3.	Vermi-composting
4.	Vermi-Wash
5.	B.D. Heap
6.	NADEP compost
7.	Green manuring
8.	Vegetable cultivation
9.	Integrated fish farming
10.	Cash crop cultivation
11.	Mushroom cultivation
12.	Floriculture
13.	Apiculture
14.	Horticulture
15.	Fruit and vegetable processing

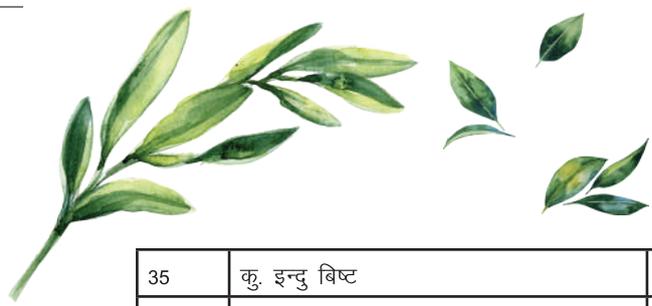
S. No.	Name of technology
16.	Traditional food items
17.	Medicinal plants cultivation
18.	Silvi-pastoral system
19.	Multipurpose tree plantation
20.	Sewing and knitting
21.	File covers, envelopes, carry-bags from Pine needles
22.	Traditional art and Craft
23.	Decorative items from household materials
24.	Nursery development
25.	Improvement and management of waste land
26.	Water harvesting tank technology
27.	Multiplication technology for bamboo
28.	Zero energy cool chamber
29.	Bio-briquetting from Pine needles
30.	Drip irrigation/handi (Pitcher) irrigation



## Annexure VI: Need assessment for livelihood activities in Jyoli village cluster

### ग्राम पंचायत कनेली

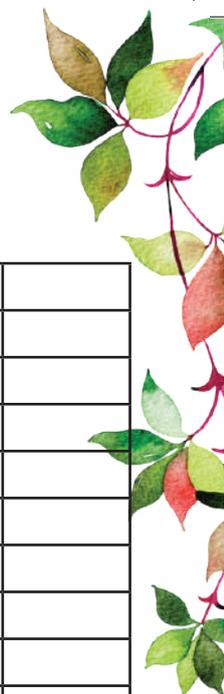
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1.	श्रीमती जानकी देवी	✓						
2.	श्री देवेन्द्र कुमार	✓			✓	✓	✓	
3.	श्रीमती दीपा उपाध्याय			✓	✓		✓	
4.	श्री राजेन्द्र प्रसाद	✓			✓			
5.	श्री शान्ति प्रकाश	✓						
6.	श्रीमती कमला देवी	✓						
7.	श्रीमती भागीरथी देवी	✓						
8.	श्रीमती कमला देवी	✓						
9.	श्री पूरन सिंह मेहरा	✓						
10.	श्रीमती नीमा देवी	✓						
11.	श्री कुन्दन सिंह	✓	✓	✓	✓		✓	
12.	श्रीमती शोभा मेहरा	✓						
13.	श्री आनन्द सिंह	✓	✓	✓	✓		✓	
14.	श्री चन्दन सिंह बिष्ट	✓			✓	✓		
15.	श्रीमती बसन्ती उपाध्याय			✓	✓		✓	
16.	श्रीमती मीनाक्षी उपाध्याय			✓	✓			
17.	श्री दनी राम				✓	✓		
18.	श्री नारायण सिंह		✓		✓		✓	
19.	श्रीमती प्रतिमा देवी			✓	✓			
20.	श्री किशन राम				✓			
21.	श्रीमती रेखा उपाध्याय				✓			
22.	श्री र्खीम राम				✓			
23.	श्री मनोज उपाध्याय		✓		✓		✓	
24.	श्री नन्द किशोर उपाध्याय						✓	
25.	श्री कमल कपिल						✓	
26.	श्री बिशन सिंह						✓	
27.	श्रीमती विमला देवी						✓	
28.	श्री धीरज सिंह				✓		✓	
29.	श्री राजेन्द्र प्रकाश				✓			
30.	श्री राजेन्द्र लोहनी				✓			
31.	श्री राजेन्द्र आर्या				✓			
32.	कु. सोनी उपाध्याय							✓
33.	कु. दीक्षा उपाध्याय							✓
34.	कु. सचेता बिष्ट							✓



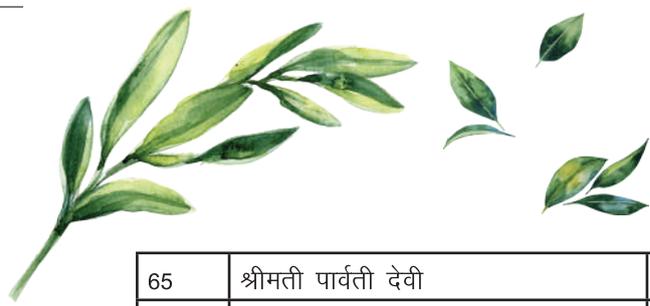
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38	कु. दीक्षा उपाध्याय			✓				
39	कु. सोनी उपाध्याय			✓				
40	कु. दीक्षा उपाध्याय			✓				
41	कु. पूनम उपाध्याय			✓				
42	श्रीमती विमला देवी			✓				
43	श्रीमती प्रेमा देवी			✓				
44	श्री पंकज उपाध्याय	✓						
45	श्री विशन सिंह सलाल	✓						
46	श्री हिमांशु भोज	✓						

### ग्राम पंचायत कनेली

क्र.स.	लाभार्थी का नाम	मुर्गी पालन	मधुमक्खी पालन	बायो ब्रिकेट	पॉली हाउस	वर्मी कम्पोस्ट	उद्यानीकरण	रैपण/राखी बनाना
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2.	श्री चन्दन राम	✓			✓	✓	✓	
3.	श्री नन्द राम	✓						
4.	श्रीमती मोहनी देवी	✓			✓			
5.	श्री ख्याली राम	✓						
6.	श्री बची राम	✓						
7.	श्री गोपाल राम	✓						
8.	श्री किशोर कुमार	✓						
9.	श्री जगदीश राम	✓			✓	✓		
10.	श्री कुवर राम	✓				✓		
11.	श्री मोहन राम	✓						
12.	श्री चन्दन राम	✓			✓			
13.	श्री पनी राम	✓			✓			
14.	श्री शान्ति राम	✓			✓			
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16.	श्री प्रेम सिंह	✓						
17.	श्री विशन सिंह	✓			✓			
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21.	श्री हेमन्त रावत	✓						
22.	श्री बचे सिंह	✓		✓	✓			
23.	श्री दीवान सिंह	✓						
24.	श्री बीरेन्द्र सिंह	✓			✓			



25.	श्री रविन्द्र सिंह	✓		✓	✓			
26.	श्री आनन्द सिंह	✓		✓				
27.	श्रीमती ममता जोषी	✓						
28.	श्री राम सिंह रावत	✓						
29.	श्री विनोद कुमार	✓						
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49.	श्री किशन सिंह				✓			
50.	श्री धन सिंह				✓			
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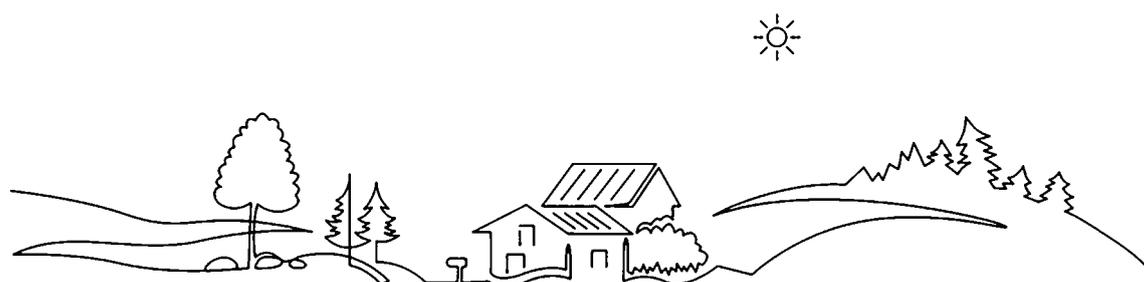
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### ग्राम पंचायत ज्योली

क्र.स.	लाभार्थी का नाम	मुर्गी पालन	मधुमक्खी पालन	बायो ब्रिकेट	पॉली हाउस	वर्मी कम्पोस्ट	उद्यानीकरण	रैपण/राखी बनाना
1.	श्री देव सिंह भोजक		✓				✓	
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3.	श्री पान सिंह सलाल		✓		✓			
4.	श्री बहादूर सिंह		✓				✓	
5.	श्री पान सिंह		✓		✓			
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25.	कु. मनीषा सलाल							✓
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40	श्री त्रिलोक सिंह				✓			
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44	श्री पान सिंह				✓			
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63	श्री त्रिलोक सिंह				✓			
64	श्री नाथू सिंह				✓			





## Annexure VII: Change Leaders in Jyoli village cluster

S. No.	Name	Age	Father's Name	Address	Education
1.	Deeksha Upadhyay	17	Mr. Rajendra Prakash Upadhyay	Village Kaneli, P.O. Jyoli, Almora	12th
2.	Soni Upadhyay	17	Mr. Nand Kishor Upadhyay	Village Kaneli, P.O. Jyoli, Almora	12th
3.	Gayatri Bisht	17	Mr. Kundan Singh Bisht	Village Bisra, P.O. Jyoli, Almora	12th
4.	Sangeeta Bisht	17	Mr. Bishan Singh Bisht	Village Bisra, P.O. Jyoli, Almora	12th
5.	Ganesh Singh Salal	26	Mr. Pratap Singh	Village Jyoli, P.O. Jyoli, Almora	Undergraduate
6.	Hema Joshi	27	Mr. Hem Chandra	Village Dilkot, P.O. Jyoli, Almora	Undergraduate
7.	Shubham Lohni	17	Mr. Girish Chandra Lohni	Village Khadkuna, P.O. Jyoli, Almora	12th
8.	Deeksha Upadhyay	23	Mr. Prakash Chandra Upadhyay	Village Kaneli, P.O. Jyoli, Almora	Graduate
9.	Babita Pant	20	Late. Mr.H.C.Pant	Village Kaneli, P.O. Jyoli, Almora	Undergraduate
10.	Manisha Rawat	17	Mr. Ram Singh Rawat	Village Kujyari P.O. Jyoli, Almora	12th
11.	Gajendra Upadhyay	30	Mr. Ganga Dutt Upadhyay	Village Kaneli, P.O. Jyoli, Almora	Post-graduate
12.	Preeti Salal	16	Mr. Deevan Singh Salal	Village Jyoli, P.O.Jyoli, Almora	12th
13.	Shweta Bisht	19	Mr. Gopal Singh Bisht	Village Bisra, P.O. Jyoli, Almora	12th
14.	Bhawna Syuni	21	Mr. Mohan Singh Syuni	Village Jyoli, P.O. Jyoli, Almora	Under-graduate



## राजभाषा हिन्दी पत्रवाड़ा के अन्तर्गत पुस्तकृत निबन्ध

प्रथम पुरस्कार - 2020

मेरा आदर्श ग्राम - दिलकोट



विनीता

ग्राम - दिलकोट, अल्मोड़ा

भारत एक ऐसा देश है जिसकी खूबसूरती हर किसी को खुशाती है। भारत का एक ऐसा ही राज्य उत्तराखण्ड है जहाँ की हर बात ही निराली है। तो ऐसे ही उत्तराखण्ड के अल्मोड़ा जिले में स्थित अपने गाँव दिलकोट की कुछ बातें मैं आप सभी को अपने आदर्श ग्राम के द्वारा बताने जा रही हूँ। पहाड़ों के बीच बसा हुआ दिलकोट ग्राम इस मार्ग से आने जाने वाले सभी लोगों का ध्यान अपनी तरफ कोन्धित करता है। यहाँ के हर मरे खेत खलिहान मानों इस बात का इशारा कर रहे हों कि अब हम दिलकोट में प्रवेश कर रहे हैं। ऐसा लगता है मानों हरियाली ओडकर ये पहाड़ हमारे स्वागत के लिए खड़े हो। यहाँ बरसात में इतना खूबसूरत मौसम रहता है कि वह देखने के बाद कोई भी हिल स्टेसन जाने की जरूरत नहीं है। यहाँ के हर मौसम का हर रंग सुहाना लगता है। आसमान के सफेद रूई जैसे दिखने वाले बादल ऐसे लगते हैं कि अब जैसे धरती पर ही उतरने वाले हैं। ऐसी ही कई सारी खूबसूरतियाँ हमारे गाँव में हैं। बस उन खूबसूरतियों को निखारने व उभारने की जरूरत है।

पहाड़ों से बहता हुआ नदियों का पानी अगर हम संभालकर रखें तो पानी की कमी महसूस नहीं होगी। इस विज्ञान युग में बहुत सारी तकनीकें हैं जिनका प्रयोग कर हम बहती पानी को समेट लें तो हमारे दिलकोट का नक्शा ही बदल जाएगा। इससे यह फायदा भी होगा कि गाँव के जिन लोगों ने खेती करना छोड़ दिया है उनका ध्यान फिर से कृषि की ओर कोन्धित होगा। दिलकोट के हर क्षेत्र में तरक्की होगी। धरती पर बिखरा हुआ अनाज, मीठे-मीठे फल और सुन्दर फूलों से हमारा दिलकोट और भी सुशोभित होगा। यदि हम अपने गाँव दिलकोट की अच्छे से देखभाल करने की ठान लें तो हमारे पूर्वजों की धरोहर तथा यहाँ के ऐतिहासिक स्थल भी एक पर्यटक स्थल बन सकेंगे। जैसे लोग अन्य गाँवों में पर्यटक बन हर जगह घूमने का आनन्द लेते हैं उसी तरह वह हमारे गाँव में भी रूचि दिखारेंगे, जिससे हमारे गाँव का आर्थिक विकास होगा। इसी तरह यदि हम अपने गाँव की ओर ध्यान दें तो हमारा दिलकोट गाँव भी पर्यटक स्थलों में आगे रहेगा। इससे हमारे गाँव दिलकोट की विशेषताएँ भी दूर-दूर तक फैलेगी और हमारे गाँव विलकोट का भी अच्छा नाम होगा, और यदि हमारे गाँव की आर्थिक स्थिति अच्छी रहेगी तो लोग अपने गाँव से शहर की ओर पलायन नहीं करेंगे। हमें हमारे दिलकोट गाँव का राजनैतिक स्तर भी ऊँचा करना होगा। जहाँ तन-मन-धन न्यूँछावर करने वाले ऐसे युवाओं का संगठन बनाना होगा जो हमारे गाँव का सही मायने में विकास कर सके। हमारे बड़े बुजुर्ग लोगों का अनुभव जानकर तथा समझकर हम ऐसे नियम बनाएँ जिससे उन्नति की ओर हम चलते और बढ़ते रहें।

हमें हमारे गाँव में अस्पताल बनाने की व्यवस्था करनी होगी। जिससे लोगों को स्वास्थ्य सम्बन्धी सुविधा हो। उन्हें गाँव से दूर शहर अस्पताल की खोज में न जाना पड़े, गर्भवतियों को भी मदद मिले। अस्पताल में इलाज करने की ऐसी व्यवस्था करानी होगी जिससे जल्दी से जल्दी सबकी शारीरिक, मानसिक बीमारी दूर हो। दिलकोट गाँव की कच्ची सड़कों को पक्का कराने की व्यवस्था करनी होगी तथा बस स्टैंड बनाने का अनुसंधे सरकार से करना होगा, जिससे हमारे गाँव तक भी बस आ सके तथा गाँव के लोगों को रोजगार मिले और गाँव का भी विकास हो। सबसे महत्वपूर्ण बात हमारे गाँव के लिए कृषि विभाग है क्योंकि गाँव में लोगों का जीवन कृषि पर ही निर्भर है। इसके लिए हमें गाँव के पानी का स्तर बढ़ाना होगा क्योंकि जिन लोगों ने कम पानी की वजह से कृषि करना छोड़ दिया या अपनी खेती बंद कर दी उनकी रुचि फिर कृषि की ओर कोन्धित करनी होगी। नई-नई तकनीकों की जानकारी सभी किसानों तक पहुँचानी होगी, जिसका फायदा लेकर हम अच्छी खेती कर सकें। सभी किसानों को शिक्षित करना होगा जिससे वे अच्छे कृषि करके कम समय में ज्यादा उत्पादन कर सकें। कई सारे छोटे-छोटे व्यवसायों को हम दिलकोट में

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## Annexure VIII: Essay of Mera Adarsh Gram written by Jyoli village cluster

शहर ही आगे बढ़ाएँ और हम हमारी जन्मभूमि-कर्मभूमि से जुड़े रहें। जिससे हमें शहर जाने और वहाँ नौकरी कर आने परिसार से दूर न रहना पड़े। जैसे अभी कुछ समय से कोरोना की वजह से सभी लोगों को रोजगारी का सामना करना पड़ रहा है। सभी की नौकरियों, व्यवसाय और स्कूल सब बंद हैं जिससे सभी को बहुत मुश्किलें हो रही हैं। इसी बात से हम अंदाजा लगा सकते हैं कि शहरों की क्या स्थिति है क्योंकि इस कोरोना काल में बड़े-बड़े व्यवसाय करने वालों ने अपने कर्मचारियों को निकाल दिया। अगर वही लोग शहर की जगह यहाँ आने गाँवों में नौकरी करते तो उन्हें इन मुशौबतों का सामना नहीं करना पड़ता। पर इन लोगों की मनचूरी यह है कि हमारे गाँवों में रोजगार है ही नहीं। अगर गाँवों में रोजगार की व्यवस्था हो तो कितना अच्छा हो। हमारे गाँव के नवयुवक, नवयुवतियाँ जिनको भौतिक क्षेत्र में रुचि है। वह डॉक्टर बनने का सपना शहर के लिए नहीं अपने गाँव के लिए साकार करेंगे। हमारे लिए भी गर्व की बात होगी कि हमारे ही गाँव के बच्चे इतने पढ़े लिखे तथा डॉक्टर बनें।

अच्छे स्कूलों की व्यवस्था करानी होगी, जिससे गाँव के सभी बच्चे शिक्षित हो और अच्छे क्षेत्रों में नौकरियाँ करें। स्वच्छता अभियान शुरू कर हमारे दिलकोट ग्राम को स्वच्छ बनाने की शुरुआत करनी होगी और इसकी शुरुआत खुद से और खुद के घर से करनी होगी। क्योंकि जब तक हम अपने आप को अपने घर को स्वच्छ नहीं रखेंगे तब तक गाँव के लिए नियंत्रण लेने में हम असमर्थ हैं। गाँव के रास्तों की मरम्मत करानी होगी ताकि किसी को आने जाने में कोई अड़ुबिधा न हो। इस तरह से हमारा गाँव दिलकोट सभी नई तकनीकों को अपनाकर और उनके बारे में जानकर तथा उनका उपयोग कर एक आदर्श गाँव बनेगा। जहाँ हर सुविधा घर-घर तक पहुँचे और शहर में वैसे लोग हमारे हरियाली से भरे खूबसूरत दिलकोट गाँव में आने को तरसें, ऐसा हो हमारा आदर्श गाँव दिलकोट।

अपने गाँव के प्रति अपनी भावना मेरे ही द्वारा लिखी गई एक कविता के द्वारा व्यक्त करने जा रही हूँ, जिसका नाम है 'मेरी जन्मभूमि'।

उगते सूरज की पहली किरण के साथ जहाँ सुबह होती थी।

जहाँ बचपन का हर रंग खिला था सारे खेलों की जहाँ पहचान हुई थी।

जहाँ हर छोटी बड़ी बात का एहसास हुआ था।

हर रिश्ते ने जहाँ एक अलग रंग उजागर किया था।

जहाँ हर त्योहार का अपना एक अलग महत्व है।

रूँ रास्ते तो आज भी टेढ़े मेढ़े हैं यहाँ।

लेकिन यहाँ के लोगों की सादगी आज भी दिल जीत लेती है।

जहाँ की हरियाली सभी के मन को मोह लेती है।

आज भी वह मेरी जन्मभूमि है हम सभी के इंतजार में वीरान है।

उम्मीद करती हूँ कि आपको मेरी कविता और मेरा लिखा हुआ निबंध 'मेरा आदर्श गाँव' दोनों ही अच्छे लगे होंगे। यदि अपने गाँव को आदर्श बनाने में हम सभी अपना-अपना योगदान दें तो अवश्य ही हमारा गाँव एक आदर्श गाँव बन सकेगा। अगर हर व्यक्ति अपने गाँव को आदर्श बनाने की ठान लें तो हमारे देश का हर गाँव तरक्की करेगा और विकास की ओर अग्रसर होगा।



## मेरा आदर्श ग्राम :- कनेली

द्वितीय पुरस्कार - 2020



### दीक्षा उपपाठ्याय

ग्राम - कनेली, अल्मोड़ा

#### प्रस्तावना

किसी भी देश के समुचित विकास के लिए उस देश के सभी क्षेत्रों का समुचित विकास होना आवश्यक है चाहे वह ग्रामीण क्षेत्र हो या शहरी क्षेत्र। किसी भी क्षेत्र को अनेक देश के विकास की कल्पना नहीं की जा सकती, प्रायः देखा जाता है कि समाज की प्राथमिक आवश्यकताएँ ग्रामीण क्षेत्र द्वारा ही पूर्ण होती हैं। इस प्रकार ग्रामीण क्षेत्रों का विकास देश के विकास के लिए एक मजबूत नींव तैयार करता है। एक आदर्श गाँव की संकल्पना को कई कारक मिलकर पूर्ण करते हैं। आदर्श गाँव का अर्थ हम उस गाँव की सामाजिक परिस्थितियों, वहाँ का सामाजिक वातावरण निर्धारित करता है। एक गाँव को आदर्श कहलाने के लिए कई शर्तों को पूर्ण करना होता है। आदर्श गाँव का अर्थ हम उस गाँव की सामाजिक परिस्थितियों, आधुनिक विचारधारा, प्राथमिक आवश्यकताओं को ध्यान में रखकर निकाल सकते हैं। इसी तीन कारकों के अध्ययन के द्वारा हम एक आदर्श गाँव की परिकल्पना को संतुष्ट कर सकते हैं।

उपरोक्त तीन कारकों के आधार पर मैं अपने गाँव कनेली को आदर्श गाँव की श्रेणी में रखना चाहूँगी क्योंकि यह एक आदर्श गाँव की परिभाषा को सार्थक किये हुए है न केवल भौगोलिक संरचना के आधार पर बल्कि सामाजिक वातावरण के आधार पर भी जिसका संक्षिप्त विवरण निम्नवत है :

#### सामाजिक परिस्थितियों

किसी भी स्थान का वातावरण वहाँ रहने वाले लोगों द्वारा निर्धारित किया जाता है। सामाजिक परिस्थितियों का ताल-मेल किसी भी गाँव को आदर्श बनाने के लिए महत्वपूर्ण कारक है। ग्रामीण समाज में आपसी सहयोग की भावना होना आवश्यक है। मुझे अपने गाँव में सामाजिक परिस्थितियों के हर पहलू को संतुष्ट करना वातावरण नजर आता है। जहाँ हर व्यक्ति समाज में अपनी जिम्मेदारियों को समझता है एवं समाज के प्रति अपने कर्तव्यों का पालन करने में कभी पीछे नहीं हटता है। मेरे गाँव का सामाजिक वातावरण आपसी सौहार्द से परिपूर्ण है। जहाँ सामाजिक भेदभाव को आसपास फटकने भी नहीं दिया जाता है। इस प्रकार मेरा गाँव आदर्श कहलाने हेतु उपयुक्त प्रथम कारक को परिपूर्ण किए हुए है। यहाँ की सामाजिक परिस्थितियों अपने आप में आदर्श गाँव की परिभाषा लिए हुए हैं।

#### आधुनिक विचारधारा

समय परिवर्तित होता है, विचारधाराएँ परिवर्तित होती हैं व हमें इन परिवर्तनों को अपनाना होता है, क्योंकि इन परिवर्तनों को अपनाए बिना विकास संभव नहीं है। आधुनिक विचारधारा आदर्श गाँव के लिए दूसरा महत्वपूर्ण कारक है। मेरे गाँव में मैं इन परिवर्तनों के प्रमाणों को सार्थक होते हुए देखती हूँ। मेरा गाँव आधुनिक विचारधारा से कदम पर कदम मिलाए हुए है। यहाँ बालिकाओं को भी बालकों के समान अधिकार प्राप्त हैं। बालिकाओं को शिक्षा से वंचित नहीं रखा गया है। बालकों के समान उन्हें भी नौकरी आदि के लिए पूर्ण स्वतंत्रता हासिल है। यह तभी संभव हो पाया है जब मेरे गाँव ने आधुनिक विचारधारा को अपनाया। इस प्रकार मेरा गाँव आदर्श कहलाने के दूसरी महत्वपूर्ण कारक को संतुष्ट करता है। यहाँ के लोगों में समझ है कि बिना आधुनिकता को अपनाये विकास संभव नहीं है व आदर्श ग्राम स्थापित करने हेतु आधुनिक विचारधारा को अपनाना, आधुनिकता को अपनाना अत्यंत आवश्यक है।

#### प्राथमिक आवश्यकताएँ

आदर्श गाँव को परिभाषित करने के लिए तीसरा महत्वपूर्ण कारक है आवश्यकताओं की पूर्ति ग्रामीणों की प्राथमिक आवश्यकताओं की पूर्ति होना अति आवश्यक है, अर्थात् उन्हें शिक्षा, स्वास्थ्य, युवाओं को रोजगार व चिकित्सालय की सुविधा मिलनी चाहिए। मैं अपने गाँव को इस तीसरे कारक में भी संतुष्ट होता हुआ देखती हूँ। मेरे गाँव में बच्चों के लिए शिक्षा, युवाओं के लिए रोजगार व चिकित्सकीय सुविधाओं की पर्याप्त मात्रा है। यहाँ प्राथमिक विद्यालय है जहाँ बच्चों को गुणवत्तापूर्ण शिक्षा प्रदान की जाती है। ताकि वह एक बेहतर भविष्य का निर्माण कर सकें तथा गाँव के तरक्की की एक नई राह प्रदान कर सकें। गाँव का प्रत्येक बच्चा शिक्षा ग्रहण कार्य में लगा हुआ है एवं बाल-मजदूरी गाँव से बहुत दूर है तथा यह एक आदर्श गाँव की निशानी है। इसी प्रकार गाँव में ग्रामीणों के स्वास्थ्य का भी उचित प्रकार से ध्यान रखा गया है व उनको चिकित्सकीय सुविधा प्राप्त है। गाँव का हर युवा कुछ न कुछ रोजगार अपनाने हुए है जिससे पलायन की स्थिति उत्पन्न न हो। इस प्रकार मेरा गाँव आदर्श गाँव कहलाने के तीसरे महत्वपूर्ण कारक पर भी खरा बैठता है।

#### उपसंहार

इस प्रकार उपरोक्त कारकों के आधार पर मैं अपने गाँव को आदर्श गाँव की श्रेणी में रखने में संकोच नहीं करूँगी। यहाँ स्वच्छता, शिक्षा, चिकित्सा, रोजगार, बालिका शिक्षा, महिलाधिकार आदि सभी बिन्दुओं का ध्यान रखा गया है जो कि आदर्श गाँव के प्रमुख बिन्दु हैं।

मैं इस प्रकार एक आदर्श गाँव की निवासी होने पर गर्व का अनुभव करती हूँ। मेरा गाँव अन्य ग्रामीणों व गाँवों के सामने एक निसाल प्रस्तुत करके उनका आदर्श बने हुए है। मैं इसको विकास के पथ पर और आगे ले जाने का प्रयास करूँगी ताकि भविष्य में यह एक विकसित व आदर्श गाँव की परिभाषा को पूँ ही संतुष्ट करता रहे। यहाँ का आदर्श समाज, आदर्श ग्रामीण, आदर्श विचारधारा ही इसे आदर्श गाँव बनाये हुए है।

हर बात पर अपनी ही बात कहता है,

मेरे अन्दर मेरा आदर्श गाँव रहता है।

दौत में फस गया गने का रेशा है।

मुट्टा खल होने से पहले दादी के आने का अन्देशा है।

गरम गुड़ से जल गई जवान है।

मोड़ पर दस रूपय में मिलने वाली मिठाई की दुकान है।

खेत में खेले किकेट का पसीना है।

एक कहानी है, मेरे सर के नीचे ददू का सीना है।

खेत की रखवाली करते सोने के लिए खाट है।

वे खाने में बनी आम की खटाई आज भी हमें याद है।

आधुनिकता की दौड़ में हम वो तीसरे बन गए।

शहर को भीड़ जाती थी उसी में बह गए।

जिन्दा है गाँव में देश की संस्कृति।

हम भूल अपनी सम्यता खुद को शहरी कहते हैं।

आँसू फिर से अपने गाँव से रिश्ता जोड़ते हैं।

हर बात पर कहते हैं, मेरे अन्दर मेरे गाँव के आदर्श लोग रहते हैं।"

## मेरा आदर्श ग्राम – खडकूना

तृतीय पुरस्कार - 2020



**शुभम् लोढनी**

ग्राम – खडकूना (ज्यौली)  
अल्मोड़ा

पर विचार करना जरूरी है। पहला प्राकृतिक व दूसरा भौतिक।

प्राकृतिक संयमनता ही किसी ग्राम को आकर्षक, सुन्दर, शाश्वत एवं जीवन्त बनाती है। प्रकृति मनुष्य की अन्यत्र सहचारी है। जिस गाँव में प्रकृति का जितना अधिक संरक्षण होता है उस गाँव के मनुष्यों तथा पशुओं को प्रकृति उससे कई गुना अधिक संरक्षण एवं सुविधा प्रदान करती है। प्रकृति का अनावश्यक दोहन तथा उसके साथ खिलवाड़ करना न केवल ग्रामीण जीवन के लिए बरन् संपूर्ण मानवता के लिए अति भयानक एवं कष्टप्रद होता है। क्योंकि—

**प्रकृति ईश्वर सगिनी है, हर रूप इससे ही बना।  
प्रकृति चेतन शक्ति है, प्रकृति से जीवन बना।।  
प्रकृति को मत कष्ट देना, प्रकृति को मत छेड़ना।  
प्रकृति जब होगी मयंक, देगी प्रलयकर वेदना।।**

जिस गाँव में जितने अधिक वन और उपवन हों, जिस गाँव में जितने अधिक फलदार वृक्ष हों, जो गाँव पशुओं तथा लताओं से जितना अधिक सुशोभित हो, जिस गाँव के लता मुरकुटों में जितने अधिक एवं विभिन्न प्रकार के फली सदैव बहचहाते रहते हों, जिस गाँव में जितने अधिक प्राकृतिक नालें, धारे, तालाब आदि प्राकृतिक जलस्रोतों का संरक्षण हो, जिस गाँव के खेत सदैव हरित धान्य से लहलहाते रहते हों और जहाँ पवित्र हृदय से प्रकृति की पूजा की जाती है वही सत्य अर्थों में सबसे समृद्धशाली एवं आदर्श गाँव है। ऐसे गाँवों में ही भारत माता निवास करती है।

हमारा देश प्रकृति का पुजारी रहा है। यहाँ पुरातन काल से ही विभिन्न वृक्षों, पवित्र नदियों आदि की पूजा की जाती रही है। प्राकृतिक संसाधनों की समृद्धि ही किसी गाँव के आदर्श रूप की आधारशिला है। प्राकृतिक धरोहर का संदुपयोग एवं संरक्षण जितना आवश्यक है उतना ही आवश्यक है उनको पवित्र एवं साफ सुधारा रखना। अपने शरीर, अपने घर, अपने अंगन आदि की

सफाई के साथ-साथ हमें अपने गाँव के नौलों, धारों, नदी, तालाबों, पोखरों, नदियों, पंचायत घरों जैसे सार्वजनिक स्थानों की स्वच्छता का सदैव ध्यान रखना चाहिए। महात्मा जो मानसिक पवित्रता के साथ बाह्य स्वच्छता को अतीव आवश्यक मानते थे। एक बार दक्षिण भारत के तंजौर जिले के मायावस शहर में अपने भाषण में उन्होंने कहा था— **“हिन्दुओं की यह बड़ी कमजोरी है कि वे नदी और तालाबों की पूजा करते हुए भी उन स्थानों का खूब दुष्प्रयोग भी करते रहते हैं।”** सार्वजनिक स्थानों को स्वच्छ रखना हमारा कर्तव्य है। उसके लिए हमें सदा प्रयत्न करना चाहिए। स्वच्छता से न केवल गाँव का आकर्षण एवं सौन्दर्य प्रतिबिम्बित होता है, अपितु इससे समस्त ग्रामवासियों को चिरन्तर स्वास्थ्य लाभ की उपलब्धि भी प्राप्त होती है।

अब आदर्श ग्राम की परिकल्पना के दूसरे पहलू पर विचार करना आवश्यक है जो है भौतिक विकास का। आधुनिक संदर्भ में केवल प्राकृतिक समृद्धि ही किसी गाँव या क्षेत्र को विकास के सौपान में अग्रसर नहीं कर सकती। वैज्ञानिक प्रगति के इस युग में भौतिक संसाधनों की उपलब्धि भी नितान्त आवश्यक ही गई है। किसी गाँव को भौतिक रूप में विकसित करने के लिए गाँव का सड़क मार्ग से जुड़ना अत्यन्त आवश्यक है। अब भी हमारे पर्वतीय क्षेत्र के कई ग्रामों में कई मील तक लोगों को पैदल चलना पड़ता है। सड़कों के अभाव में कई गाँव पलायन के कारण खाली हो चुके हैं। कई गाँवों के अस्तित्व पर ही खतरा नडरा रहा है। कई गाँव आधुनिक सुख-सुविधा के साधनों से बिल्कुल अपरिचित हैं। आदर्श ग्राम के निर्माण में विद्युतीकरण की समुचित व्यवस्था आवश्यक है। शहरों की तरह गाँवों में स्टीट लाइटों का होना आवश्यक है। बिजली की लाइनों में समुचित पावर का होना भी जरूरी है जिससे गाँवों में नवीन कुटीर उद्योगों को पुनर्जीवित किया जा सकता है। जिससे गाँवों को स्वावलंबी बनाने में सहायता मिल सकती।

गाँवों में जल की पर्याप्त व्यवस्था होनी चाहिए। कई गाँवों में प्राचीन जल स्रोतों के सूख जाने के कारण ग्रामवासियों को कई मील दूर जाकर पेयजल लाना पड़ता है। जल के अभाव में आदर्श ग्राम की परिकल्पना ही असत्य प्रतीत होती है। स्वच्छ पेय जल को गाँव-गाँव तक पहुँचाना ही राज्य सरकारों की सर्वोच्च प्राथमिकता होनी चाहिए। आदर्श ग्राम की परिकल्पना को साकार रूप देने के लिए गाँव में स्वास्थ्य सेवाओं का होना आवश्यक है। कम से कम चार-पाँच गाँवों के बीच में एक बेसिक स्वास्थ्य केन्द्र होना चाहिए जिससे स्वास्थ्य संबंधी सामान्य समस्याओं का निवारण हो सके।

मनुष्य के सर्वांगीण विकास के लिए शैक्षिक संस्थानों तथा सांस्कृतिक एवं मनोरंजन के केन्द्रों का होना भी आवश्यक है। हर आदर्श गाँव में प्रारंभिक शिक्षा के लिए आदर्श पाठशालाएँ अवश्य होनी चाहिए जिससे बालक-बालिका के सर्वांगीण विकास की परिकल्पना को साकार किया जा सके। उपरोक्त सभी परिकल्पनाओं को तभी साकार रूप दिया जा सकता है जब मानवता एवं नीतिकता पूर्ण समाज हो। जहाँ केवल अपने हित के लिए नहीं सर्वजन हिताय लोग कार्य करते हों। जहाँ भ्रष्टाचार न हो, जहाँ प्रकृति द्वारा प्रदत्त कर्म को पूर्ण निष्ठा के साथ सम्पन्न किया जाता हो। जहाँ सब वर्गों, जातियों एवं संप्रदायों में परस्पर अनुराग एवं स्नेह का वातावरण हो। ऐसे समाजता पूर्ण सुरम्य परिवेश को बनाने में केवल कुछ ग्रामों तथा कुछ लोगों का योगदान ही आवश्यक नहीं है अपितु संपूर्ण देशवासियों की अनवरत निष्ठा एवं तत्परता अपेक्षित है।

**“सर्वे भवन्तु सुखिनः, सर्वे सन्तु निरामयाः।  
सर्वे भद्राणि पश्यन्तु मा कश्चिद् दुःखभाग्यवत्।।”**





## मेरा आदर्श ग्राम : कनेली

सांत्वना पुरस्कार - 2020



### सोनी उपाध्याय

ग्राम - कनेली, अल्मोड़ा

"शहर में छाते पड़ जाते हैं, जिन्दगी के पॉव में।  
सुकून का जीवन बिताना है, तो आ जाऊँ गाँव में"

#### प्रस्तावना

मोहनवास करमचन्द्र गोंधी जो जिन्हें हम महात्मा गोंधी यानि बापू के नाम से जानते हैं उन्हेने कहा है "यदि आपको भारत को वास्तव में जानना है तो उसके गाँव में जाइये क्योंकि असली भारत यहाँ के गाँव में बसा हुआ है"। एक समय हुआ करता था जब भारत देश सोने की बिडिया कहलाता था। जब देश का मतलब हरे-मेरे गाँव तथा वहाँ के सुखी संपन्न लोग थे। भारत की 80 फीसदी आबादी गाँवों में वास करती थी मगर आज 60 प्रतिशत लोग ही गाँवों में रहते हैं। महानगरों के लोग जब भी अपने गाँव आते हैं वो एक सुखद अनुभव से प्रसन्न होते हैं। गाँव का हमारे इस समाज से महत्वपूर्ण योगदान इसलिए भी है कि विभिन्न समाजों में रहने वाले लोगों के मूल गाँवों से जुड़े रहते हैं, गाँव से किसी न किसी रूप से जुड़े हुए हैं तथा अपने आदर्श गाँव की छवि प्रत्येक के हृदय में है।

#### मेरा आदर्श गाँव

उत्तराखण्ड के अल्मोड़ा जनपद मुख्यालय से 17 किमी की दूरी पर स्थित मेरा गाँव कनेली है। यह बाकी अन्य गाँवों के समान ही है परन्तु इसमें कुछ विशेष बात है। हमारे गाँव में शिवाजी का मध्य मंदिर है जहाँ विभिन्न त्योहारों जैसे - नवरात्रि, दीपावली, शिवरात्री आदि पर विशेष आयोजन होते हैं। लोग एक दूसरे के साथ भरपूर आनन्द उठाते हैं। सभी लोग एक दूसरे से प्रेम्भाव रखते हैं। हमारे गाँव में नवरात्र जागर का भी आयोजन किया जाता है जहाँ दूसरे गाँव के लोग भी हर्षोल्लास से आते हैं। अतः मेरा गाँव आदर्श गाँव होने के सभी मापदण्डों पर खरा उतरता है।

#### लोगों का रहन-सहन एवं आवश्यकताएँ

मेरे गाँव में सभी लोग बिना गेद-भाव के रहते हैं। लोग वसुधैव कुटुम्बकम् के बारे में यद्यपि अरुचिकर हो सकते हैं परन्तु मेरे गाँव का प्रत्येक निवासी सपूर्ण गाँव के निवासियों को अपना ही परिवार मानकर सभी के साथ सौहार्द एवं भावुत्व प्रेम के साथ रहता है। गाँव के लोग उन्हें भी कभी नहीं भूलते जो गाँव से विस्थापित शहरों में जा बसे हैं। गाँव को आदर्श गाँव तभी कहा जाएगा जब वहाँ के लोगों को मजदूरी या नौकरी करने के लिए शहरों को पलायन न करना पड़े। इस प्रकार आदर्श गाँव छोटा शहर नहीं होगा, वह प्रकृति की गोद में पलता पशु होगा। हजारों सालों के अनुभव का लाभ लेकर पुरानी नींव पर बना नया महल होगा। पुरातन के युगमंडल बनाकर हरियाली भरे वातावरण में परिवार भाव में रहता जन समूह होगा। इस योजना में सामाजिक व आर्थिक विकास के लिए सार्वजनिक सेवाओं तक पहुँच में सुधार पर भी जोर दिया जाता है। आदर्श ग्राम योजना के तहत इससे एक गाँव गोद लेकर उसमें विकास कार्य कराना होता है। इससे गाँव में बुनियादी सुविधाओं के साथ ही खेती, पशुपालन, कुटीर उद्योग, रोजगार आदि पर ध्यान दिया जाता है। गाँव का मुख्य आय स्रोत कृषि और पशुपालन है। कुछ परिवार लघु उद्योग पर निर्भर हैं। मेरे गाँव में मक्का, सरसों आदि की उपज होती है।

गाँव के प्रबंधन के लिए पंचायत है। गाँव के उत्थान के लिए अनेक समितियाँ बनाई गई हैं। ग्रामीणों की समस्या पंचायत के सामने रखी जाती है। गाँव के गलियों की सफाई समिति की जिम्मेदारी है। मेरे गाँव में ग्राम सुधार की दृष्टि से शिक्षा पर पर्याप्त ध्यान दिया जा रहा है। यहाँ पक्की सड़कों व बिजली की व्यवस्था है। फिर भी ग्राम सुधार की दृष्टि में अभी बहुत कुछ किया जाना बाकी है। अभी भी अधिकांश किसान निरक्षर हैं। गाँवों में उद्योग धर्मों का विकास अधिक नहीं हो सका है। ग्राम पंचायतों तथा

न्याय पंचायतों को धीरे-धीरे अधिक अधिकार प्रदान किये जा रहे हैं। इसलिए यह सोचना भूल होगी कि जो कुछ किया जा चुका है वह बहुत है, वास्तव में इस दिशा में जितना कुछ किया जाए उतना कम है। हमें यह बात नहीं भूलनी चाहिए कि गाँवों के विकास पर ही देश का विकास निर्भर है।

#### मेरे गाँव की विशेषताएँ एवं महत्व

मेरा गाँव अत्यन्त सुन्दर है। गाँव के कई लोगों ने गाँव का नाम रोजन किया है। अतः हमारा गाँव सम्माननीय भी है। गाँव में कई प्रकार के फल-फूल एवं फसलें उगाई जाती हैं। हमारा गाँव एक कृषि प्रधान ग्राम है। यहाँ विभिन्न प्रकार की वनस्पतियाँ हैं। गाँव हम सभी निवासियों के लिए अत्यन्त महत्वपूर्ण है क्योंकि यह हमें उचित संसाधन देता है व हमारी आजीविका का भी साधन है। इसके अतिरिक्त हमारा गाँव हमारी जन्म भूमि है जो हमें प्राणों से प्रिय है।

#### उपसंहार

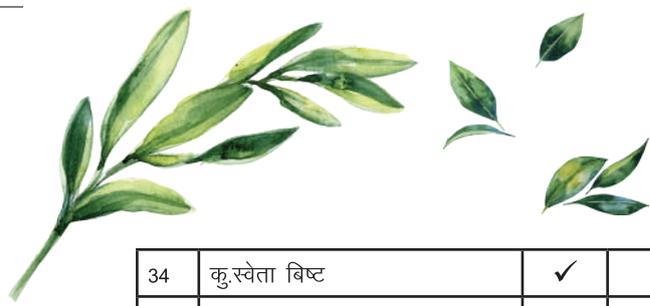
हमारा गाँव एकरूपता समरसता का प्रतीक है। यहाँ लोगों की कई आवश्यकताओं की पूर्ति नहीं हुई है जिसके लिए गाँव के सभी व्यक्ति विकास कार्यों की मांग करते हुए सक्रिय हैं। लोग विकास तथा उचित संसाधनों की प्रतीक्षा करते हुए इस आशा में हैं कि यहाँ से विस्थापित लोग पुनः आ जाए और यही लोगों का एक दूसरे के प्रति स्नेहभाव है जो सभी को एक दूसरे से जोड़ता है।

"खींव लाता है गाँव में बड़े बूढ़ों का आशीर्वाद,  
लक्ष्मी गुड़ के साथ बाजरे की रोटी का स्वाद।"



## Annexure IX: List of beneficiaries in Jyoli village cluster

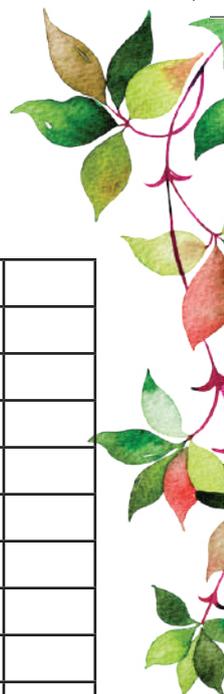
क्र. स.	लाभार्थी का नाम	सामान्य	अनु सूचित जाति	कोविड रिटर्न	मुर्गी पालन	मुर्गी के बच्चों की संख्या	मधुमक्खी पालन	बायो ब्रिकेट	पॉली हाउस	वर्मी कम्पोस्ट	उद्यानीकरण	रैपण/ राखी बनाना
<b>ग्राम पंचायत कनेली</b>												
1.	श्रीमती जानकी देवी	✓			✓	20						
2.	श्री देवेन्द्र कुमार		✓		✓	50			✓	✓	✓	
3.	श्रीमती दीपा उपाध्याय	✓						✓	✓		✓	
4.	श्री राजेन्द्र प्रसाद		✓		✓	30			✓			
5.	श्री शान्ति प्रकाश		✓		✓	30						
6.	श्रीमती कमला देवी		✓		✓	20						
7.	श्रीमती भागीरथी देवी		✓		✓	10						
8.	श्रीमती कमला देवी		✓		✓	10						
9.	श्री पूरन सिंह मेहरा	✓			✓	30						
10.	श्रीमती नीमा देवी	✓			✓	20						
11.	श्री कुन्दन सिंह	✓			✓	30	✓	✓	✓		✓	
12.	श्रीमती शोभा मेहरा	✓			✓	30						
13.	श्री आनन्द सिंह	✓			✓	30	✓	✓	✓		✓	
14.	श्री चन्दन सिंह बिष्ट	✓			✓	30			✓	✓		
15.	श्रीमती बसन्ती उपाध्याय	✓						✓	✓		✓	
16.	श्रीमती मीनाक्षी उपाध्याय	✓						✓	✓			
17.	श्री दनी राम		✓						✓	✓		
18.	श्री नारायण सिंह	✓					✓		✓		✓	
19.	श्रीमती प्रतिमा देवी	✓						✓	✓			
20.	श्री किशन राम		✓						✓			
21.	श्रीमती रेखा उपाध्याय	✓							✓			
22.	श्री खीम राम		✓						✓			
23.	श्री मनोज उपाध्याय	✓					✓		✓		✓	
24.	श्री नन्द किशोर उपाध्याय	✓									✓	
25.	श्री कमल कपिल	✓									✓	
26.	श्री बिशन सिंह	✓									✓	
27.	श्रीमती विमला देवी	✓									✓	
28.	श्री धीरज सिंह	✓							✓		✓	
29.	श्री राजेन्द्र प्रकाश	✓							✓			
30.	श्री राजेन्द्र लोहनी	✓							✓			
31.	श्री राजेन्द्र आर्या		✓						✓			
32.	कु. सोनी उपाध्याय	✓										✓
33.	कु. दीक्षा उपाध्याय	✓										✓



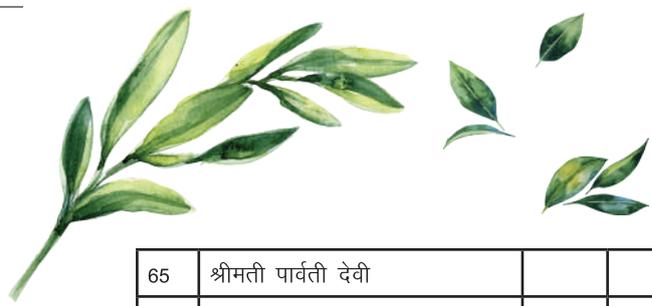
34	कु.स्वेता बिष्ट	✓										✓
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36	कु. गायत्री बिष्ट	✓					✓					✓
37	कु. संगीता बिष्ट	✓					✓					✓
38	कु. दीक्षा उपाध्याय	✓					✓					
39	कु. सोनी उपाध्याय	✓					✓					
40	कु. दीक्षा उपाध्याय	✓					✓					
41	कु. पूनम उपाध्याय	✓					✓					
42	श्रीमती विमला देवी	✓					✓					
43	श्रीमती प्रेमा देवी	✓					✓					
44	श्री पंकज उपाध्याय	✓		✓	50							
45	श्री विशन सिंह सलाल	✓		✓	10							
46	श्री हिमांशु भोज	✓		✓	5							
	कुल लाभार्थी	27	10		14		04	05	19	03	11	6

### ग्राम पंचायत कुज्याड़ी-दिलकोट

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2.	श्री चन्दन राम		✓	✓	✓	50			✓	✓	✓		
3.	श्री नन्द राम		✓		✓	30							
4.	श्रीमती मोहनी देवी		✓		✓	30			✓				
5.	श्री ख्याली राम		✓		✓	50							
6.	श्री बची राम		✓		✓	30							
7.	श्री गोपाल राम		✓		✓	30							
8.	श्री किशोर कुमार		✓		✓	30							
9.	श्री जगदीश राम		✓		✓	30			✓	✓			
10.	श्री कुवर राम		✓		✓	50				✓			
11.	श्री मोहन राम		✓		✓	10							
12.	श्री चन्दन राम		✓		✓	50			✓				
13.	श्री पनी राम		✓	✓	✓	30			✓				
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15.	श्री शेर सिंह	✓			✓	50			✓	✓			
16.	श्री प्रेम सिंह	✓			✓	30							
17.	श्री विशन सिंह	✓			✓	30			✓				
18.	श्रीमती पार्वती देवी	✓			✓	30							
19.	श्री राजेन्द्र सिंह रावत	✓			✓	30			✓				
20.	श्री जगत सिंह रावत	✓			✓	30		✓	✓				
21.	श्री हेमन्त रावत	✓			✓	30							
22.	श्री बचे सिंह	✓			✓	30		✓	✓				
23.	श्री दीवान सिंह	✓			✓	10							
24.	श्री बीरेन्द्र सिंह	✓			✓	50			✓				



25.	श्री रविन्द्र सिंह	✓		✓	50		✓	✓			
26.	श्री आनन्द सिंह	✓		✓	30		✓				
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28.	श्री राम सिंह रावत	✓		✓	30						
29.	श्री विनोद कुमार		✓	✓	30						
30.	श्री मोहन राम		✓	✓	30						
31.	श्री राजेन्द्र सिंह	✓		✓	30						
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34.	श्री आशुतोष कनवाल	✓				✓				✓	
35.	श्री महेन्द्र सिंह	✓				✓					
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37.	श्रीमती पार्वती देवी	✓				✓					
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40.	श्री हेम चन्द्र जोशी	✓				✓					
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45.	श्री हर सिंह रावत	✓				✓				✓	
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49.	श्री किशन सिंह	✓						✓			
50.	श्री धन सिंह	✓						✓			
51.	श्री लक्ष्मी दत्त जोशी	✓						✓			
52.	श्री पान सिंह रावत	✓						✓			
53.	श्रीमती भगवती देवी	✓						✓			
54.	श्री हरी राम		✓					✓			
55.	श्रीमती हेमा जोशी	✓					✓				✓
56.	कु. लता कनवाल	✓									✓
57.	कु. मनस्वी जोशी	✓									✓
58.	कु. मनीषा रावत	✓					✓				✓
59.	श्रीमती हेमा देवी						✓				
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63.	श्रीमती हीरा देवी						✓				
64.	श्रीमती आनन्दी देवी						✓				



65	श्रीमती पार्वती देवी						✓					
66	श्रीमती आनन्दी देवी						✓					
67	श्री गणेश लाल						✓					
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<b>ग्राम पंचायत-ज्योलीशिलिंग-खड़कूना</b>												
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2.	श्री त्रिलोक सिंह सलाल	✓					✓		✓			
3.	श्री पान सिंह सलाल	✓					✓		✓			
4.	श्री बहादूर सिंह	✓					✓				✓	
5.	श्री पान सिंह	✓					✓		✓			
6.	श्री विजय लोहनी	✓					✓				✓	
7.	श्री नरेश लोहनी	✓					✓				✓	
8.	श्री मुकेश लोहनी	✓					✓				✓	
9.	श्री मोहित लोहनी	✓					✓				✓	
10.	श्री खगेश चन्द्र लोहनी	✓									✓	
11.	श्री त्रिलोक सिंह	✓									✓	
12.	श्रीमती सरस्वती देवी		✓								✓	
13.	श्री ओम प्रकाश		✓								✓	
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15.	श्री गणेश सलाल	✓									✓	
16.	श्री गोविन्द राम	✓									✓	
17.	श्री सुन्दर सिंह	✓									✓	
18.	श्री नितिन लोहनी	✓									✓	✓
19.	श्रीमती ज्योती लोहनी	✓									✓	✓
20.	श्रीमती गंगा लोहनी	✓									✓	✓
21.	श्रीमती हेमा लोहनी	✓									✓	✓
22.	कु. शोभा स्यूनी	✓										✓
23.	श्रीमती हेमा लोहनी	✓									✓	✓
24.	कु. सपना सलाल	✓										✓
25.	कु. मनीषा सलाल	✓										✓
26.	श्रीमती दीपा लोहनी	✓									✓	✓
27.	कु. प्रीति सलाल	✓										✓
28.	श्रीमती भावना सलाल	✓										✓
29.	कु. भावना स्यूनी	✓										✓
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32.	श्रीमती कमला लोहनी										✓	✓
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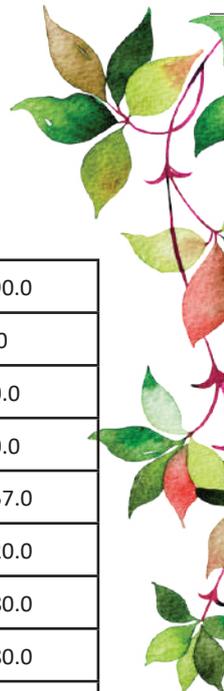
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40	श्री त्रिलोक सिंह								✓			
41	श्रीमती हीरा देवी								✓			
42	श्री नाथू राम								✓			
43	श्री किशन सिंह								✓			
44	श्री पान सिंह								✓			
45	श्री पान सिंह सलाल								✓			
46	श्री गोविन्द राम								✓			
47	श्री प्रयाग राम								✓			
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49	श्री नन्दन सिंह								✓			
50	श्री भवान सिंह								✓			
51	श्री सुन्दर सिंह								✓			
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53	श्री शेर राम								✓			
54	श्री पूरन सिंह								✓			
55	श्रीमती लीला देवी								✓			
56	श्रीमती राधिका देवी								✓			
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58	श्रीमती आनन्दी देवी								✓			
59	श्रीमती मोहनी देवी								✓			
60	श्री बची राम								✓			
61	श्री बची राम								✓			
62	श्री गोविन्द राम								✓			
63	श्री त्रिलोक सिंह								✓			
64	श्री नाथू सिंह								✓			
	कुल लाभार्थी	27	3	-	-		09	-	26	-	27	9





## Annexure X: Baseline income of farmers in mid-2022 and increase in income after project interventions (between Sept. 2020 and Sept. 2022).

S. No.	Stakeholder Name	Base Income (Rs.) (Agriculture+Livestock +Horticulture)	Income through Poly house	Income through Poultry farming	Income through Beekeeping	Vermi - compost	Total Income generated
1	Mrs. Deepa Upadhyay	24000.0	7285.0	7600.0	-	-	14885.0
2	Mr. Rajander Prakesh Ram	4000.0	9411.0	8560.0	-	-	17971.0
3	Mr. Devendra Arya	868.0	6024.0	124470.0	-	1800.0	132294.0
4	Mr. Meenakshi Upadhyay	12000.00	6917.0	-	-	-	6917.0
5	Mr. Ram Singh	-	-	-	9000.0	-	9000.0
6	Mrs. Basanti Upadhyay	12000.0	8499.0	-	-	-	8499.0
7	Mr. Kishan Ram	12000.0	6436.0	-	-	-	6436.0
8	Mr. Rajeev Lohani	12000.0	7298.0	-	-	-	7298.0
9	Mr. Khem Ram	600.0	9181.0	-	-	-	9181.0
10	Mrs. Rekha Upadhyay	8680.0	5165.0	-	-	-	5165.0
11	Mr. Dani Ram	48000.0	7834.0	-	-	-	7834.0
12	Mr. Bhagwant Kapil	8600.0	6996.0	-	-	-	6996.0
13	Mr. RajenderArya	4000.0	8393.0	-	-	-	8393.0
14	Mrs. Kamla Devi	8680.0	-	5548.0	-	-	5548.0
15	Mr. Manoj Upadhyay	60000.0	19121.0	-	9000.0	-	28121.0
16	Mr. Rajender Singh	8680.0	7152.0	-	-	-	7152.0
17	Mr. Anand Singh	5400.0	7278.0	3700.0	7000.0	-	17978.0
18	Mr. Kundan Singh	8680.0	6750.0	9000.0	7000.0	-	22750.0
19	Mr. Dheeraj Singh	2000.0	6091.0	-	-	-	6091.0
20	Mr. Narayan Singh	6000.0	6708.0	-	7000.0	-	16708.0
21	Mr. Puran Singh	4000.0	-	2240.0	-	-	2240.0
22	Mrs. Neema Devi	4000.0	-	36030.0	-	-	36030.0
23	Mr. Chandan Singh	4000.0	7294.0	23840.0	-	-	31134.0
24	Mrs. Janki Devi	10000.0	-	10730.0	-	-	10730.0
25	Mrs. Shobha Mehra	10000.0	-	10660.0	-	-	10660.0
26	Mr. Shanti Prakash	8680.0	-	20900.0	-	-	20900.0
27	Mr. Chandan Ram	4000.0	7228.0	34800.0	3000.0	-	45028.0
28	Mrs. Mohni Devi	8680.0	7198.0	6850.0	-	-	14048.0
29	Mr. Laxmi Datt Joshi	1600.0	2801.0	-	-	-	2801.0
30	Mr. Khyali Ram	8680.0	-	36860.0	-	-	36860.0



31	Mr. Bachhi Ram	4600.0	-	28990.0	-	-	28990.0
32	Mr. Vinod Kumar	8680.0	-	600.00	-	-	600.0
33	Mr. Hem Chandra Joshi	26000.0	-	-	3000.0	-	3000.0
34	Mrs. Mamta Joshi	8680.0	-	4500.0	-	-	4500.0
35	Mr. Sher Singh	12000.0	6457.0	57000.0	6000.0	-	69457.0
36	Mr. Jagat Singh	5600.0	13020.0	8400.0	-	-	21420.0
37	Mr. Rajender Rawat	9000.0	6290.0	4290.0	-	-	10580.0
38	Mr. Bishan Singh Kanwal	30000.0	3980.0	34000.0	-	-	37980.0
39	Mr. Lal Singh	8680.0	4671.0	-	-	-	4671.0
40	Mr. Kishan Singh	8680.0	8422.0	-	-	-	8422.0
41	Mr. Tej Singh	18000.0	7742.0	1200.0	-	-	8942.0
42	Mr. Bache Singh Rawat	40800.0	7459.0	24800.0	-	-	32259.0
43	Mr. Ravindra Singh	44800.0	4861.0	3000.0	8000.0	-	15861.0
44	Mr. Dhan Singh	24000.0	6696.0	-	-	-	6696.0
45	Mr. Heera Singh	30000.0	7206.0	-	3000.0	-	10206.0
46	Mr. Pani Ram	44800.0	-	3000.0	-	-	3000.0
47	Mr. Chandan Ram	50000.0	6854.0	15000.0	-	-	21854.0
48	Mrs. Bhgawati Devi	8680.0	8246.0	-	-	-	8246.0
49	Mr. Shanti Ram	8680.0	8896.0	2000.0	-	-	10896.0
50	Mr. Jagdish Ram	8680.0	-	2000.0	-	-	2000.0
51	Mr. Hari Ram	8680.0	6815.0	0	-	-	6815.0
52	Mrs. Parvati Devi	8680.0	-	16150.0	-	-	16150.0
53	Mr. Virender Singh	8680.0	-	5200.0	-	-	5200.0
54	Mr. Anand Singh	8680.0	-	2500.0	-	-	2500.0
55	Mr. Gopal Ram	8680.0	-	10400.0	-	-	10400.0
56	Mr. Kishor Ram	8680.0	-	800.0	-	-	800.0
57	Mr. Kuvar Ram	8680.0	-	12500.0	-	-	12500.0
58	Mr. Chandan Ram	8680.0	-	500.0	-	-	500.0
59	Mr. Ashutosh Kanwal	17900.0	-	-	7000.0	-	7000.0
60	Mrs. Jamuna Devi	2600.0	-	-	3000.0	-	3000.0
61	Mr. Dev Singh Bhojak	2800.0	-	-	3000.0	-	3000.0
62	Mr. Trilok Singh	8680.0	-	-	6000.0	-	6000.0
	<b>Total/ Mean</b>	<b>814308.0 (13134)</b>	<b>281953.0 (7420)</b>	<b>572318.0 (15729)</b>	<b>81000.0 (5786)</b>		<b>938493.0 (15136)</b>







## About the Institute

G.B. Pant National Institute of Himalayan Environment (NIHE) was established in 1988-89 as an Autonomous Institute of the Ministry of Environment, Forest & Climate Change (MoEF&CC), Government of India. The Institute has been identified as focal agency to advance scientific knowledge, evolve integrated management strategies, demonstrate their efficacy for conservation of natural resources, and ensure environmentally sound development in the entire Indian Himalayan Region (IHR).



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**&**

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**G.B. Pant National Institute of Himalayan Environment (NIHE)**

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