

# Socio-Agricultural Dynamics and Environmental Conditions: A Case Study of Meti Village in Kangra District, Himachal Pradesh, India

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## Abstract

This research explores the intricate relationship between environmental awareness, agricultural practices, and socio-economic factors in Meti village, Dharamshala, Himachal Pradesh. With the region's unique geographical and climatic conditions, the study aims to assess the level of environmental concern among the villagers, the challenges they face in farming, and the effectiveness of government assistance in supporting sustainable agriculture. Utilizing a mixed methods approach, the research combines quantitative data from structured surveys with qualitative insights from interviews and observations, providing a holistic view of the village's environmental and agricultural dynamics. The findings reveal that a significant portion of the population in Meti village is deeply concerned about environmental issues, particularly climatic change and deforestation. These concerns are closely tied to the farming challenges faced by the community, including unpredictable weather patterns, pests, and the high cost of inputs. Despite the evident challenges, the level of government support perceived by the villagers is notably low, with only a small percentage of respondents acknowledging adequate assistance. A key aspect of the study is the examination of the villagers' environmental practices, such as the use of reusable items, water conservation, and waste management. The data indicates a diverse range of practices, with a substantial reliance on traditional methods like burning household waste, which raises questions about the sustainability of these practices in the long term. The study also highlights the low adoption rate of renewable energy sources, despite the potential benefits for the community. In conclusion, the research underscores the need for enhanced government intervention and support to address the environmental and agricultural challenges in Meti village. It also emphasizes the importance of increasing environmental awareness and promoting sustainable practices within the community to ensure long-term ecological balance and agricultural productivity.

**Keywords:** Environmental Awareness, Sustainable Agriculture, Government Assistance, Meti Village, Himachal Pradesh, Farming Challenges, Climate Change.

## INTRODUCTION

"Socio-economic agriculture refers to the study and practice of agricultural systems that not only focus on the production of food and other agricultural products but also consider the social and economic factors that affect farming communities. This approach emphasizes the interconnectedness of agriculture with social structures, economic conditions, and cultural practices, aiming to promote sustainable development, equitable distribution of resources. (Ellis,2000). Interactions between social and economic elements are referred to as socioeconomic factors. It frequently refers to the interaction between a person's or a group's social environment such as social standing, hea

lth, and education and their economic actions such as wealth, income, and employment. Agriculture plays a critical role in the global economy, providing the primary source of food and raw materials for industries, and it also influences social structures, culture, and the environment. In Himachal Pradesh, agriculture is the backbone of the state's economy and is vital to the lives of its citizens. For a considerable proportion of the population, agriculture continues to be their main source of income and nutrition, with many depending on small-scale farming. Organic farming has gained popularity in recent years, taking advantage of the state's comparatively pristine environment to generate agricultural goods that are both healthier and less harmful to the environment. The effects of climate change, a lack of arable land, and reliance on monsoon rains are some of the difficulties facing Himachal Pradesh's agriculture. The relationships between society and the economy, socioeconomic studies aim to understand how these elements affect individual and collective well-being, development, and overall economic performance within different communities and regions. Agriculture is the backbone of the rural economy, and understanding the socio-agricultural environment of a region is crucial for sustainable development. Socio-agriculture is a broad term that encompasses the various social, cultural, and economic aspects of agriculture. It examines the relationship between agriculture and society, exploring how agriculture practices are shaped by social factor and how they, in turn, impact social structures and communities. The term social agriculture refers to the set of activities that employ the resources of social agriculture and animal husbandry promotes therapeutic, educational, recreational, social, and work inclusion actions and useful services for every day. At the time of formation of Himachal Pradesh in 1971, it was an economically backward rural area with poorly developed rural infrastructure such as rural roads, electricity, housing, transport, banking and market network due to its hilly and rugged mountainous terrain. Socioeconomic conditions in the hilly rural area differ from the plain area. These areas are still using traditional methods of agriculture due to small size of landholding and moreover, terrain not allowed to use machinery over there. Agriculture plays an essential role in the process of economic development. The integrated interaction between social elements, agricultural practices, and the environment is referred to as the socio-agricultural environment. It looks at how these three factors work together and affect one another, with an emphasis on how the agricultural industry may promote sustainable development, social progress, and environmental preservation. The significance of farming in the Kangra region is reflected in the agricultural festivals and rituals that play a crucial role in the social fabric. But Kangra also has to deal with environmental issues, including deforestation, soil erosion, and the effects of climate change. Sustainable farming methods, such as agroforestry and organic farming, are being encouraged to preserve the environment and guarantee agricultural productivity over the long term. This type of survey examines how factors such as income, education, land ownership, farming methods, access to resources, and cultural practices influence agricultural productivity and sustainability. It also assesses the impact of agriculture on the livelihoods, social structures, and economic well-being of the population. The land's fertility depends on effective water management, which is supported by conventional irrigation systems like kuhls . In general, Kangra's socio-agricultural environment combines a strong agricultural legacy, community engagement, and an increasing focus on sustainability to ensure the continued viability of farming in the area

### **Review of Literature**

**Jules Pretty and colleagues (2005)** review, *Sustainable Agriculture: A Review*, examines various sustainable agricultural practices and assesses their effectiveness in achieving environmental and social

sustainability. The review highlights that practices such as organic farming and agroecology offer significant benefits, including improved soil health, enhanced biodiversity, and reduced environmental pollution. These methods also contribute to social sustainability by bolstering local food security and community resilience. However, the review emphasizes that for these practices to be widely adopted, systemic changes are necessary. This includes supportive policies, changes in agricultural subsidies, and shifts in research and education. Challenges such as sector resistance, limited technical knowledge, and insufficient financial support must be addressed to facilitate the broader implementation of sustainable practices. Through case studies and practical examples, the review demonstrates the positive outcomes of sustainable agriculture and calls for a coordinated effort among governments, institutions, and farmers to promote these methods effectively.

**Joachim von Braun and Rainer Thiele's (2007)** work, *Agricultural Policy and Rural Development: An Analysis*, delves into the effectiveness of agricultural policies and their impact on rural development. The authors find that policies which integrate agricultural development with improvements in rural infrastructure and social services are significantly more effective in fostering comprehensive rural development. Such integration ensures that agricultural growth is supported by essential infrastructure like roads and irrigation systems and is complemented by social services such as education and healthcare. The study emphasizes that a holistic approach—addressing various dimensions of rural life beyond just agricultural production—leads to more sustainable and inclusive development outcomes. By examining case studies and practical examples, the work illustrates how theory translates into practice and highlights the importance of comprehensive policy design in achieving long-term rural development goals.

**Sharma and Thakur (2015)**: conducted a comprehensive study on the socio-economic conditions of farmers in the state, focusing on income disparities, education levels, and access to resources. Their findings revealed significant regional disparities, with some areas experiencing substantial growth due to tourism and horticulture, while others, particularly in remote regions, lag behind. The study also discussed how socio-economic factors such as land ownership and education impact agricultural productivity and household income.

**Sharma and Pathak (2016)**: analysed the impact of rural infrastructure development on agricultural productivity and farmers' income in Himachal Pradesh. Their study highlighted the importance of roads, irrigation facilities, and market access in enabling farmers to sell their produce at better prices and reducing post-harvest losses. The study concluded that improving rural infrastructure is essential for enhancing agricultural productivity and, consequently, the socio-economic well-being of farming communities.

**Verma (2016)**: analysed the effectiveness of government policies in promoting sustainable agriculture and improving rural livelihoods. The study found that while several initiatives, such as subsidies for organic farming and the promotion of farmer cooperatives, have been successful, there are still gaps in implementation and outreach, particularly in remote areas.

**Joshi and Kumar (2017)**: explored how out-migration affects agricultural practices in rural areas, focusing on labour shortages and changes in land use patterns. The study found that as younger generations migrate to urban areas or other states for better employment opportunities, the agricultural workforce in villages diminishes, leading to fallow lands and a decline in agricultural productivity. The research suggested that encouraging rural employment opportunities and improving agricultural profitability could help mitigate the negative effects of migration.

**Negi (2017)**: emphasized the importance of horticulture in enhancing the economic status of farmers in the state. The study highlighted that while traditional crops like wheat and maize are still prevalent, the

shift towards high-value horticultural crops has led to improved income levels among farming households. However, the research also pointed out that reliance on monoculture, especially in apple farming, makes the economy vulnerable to climatic variations and market fluctuations.

**Prasad (2018):** conducted a study on livelihood diversification among farmers in Himachal Pradesh, examining how off-farm income sources impact agricultural productivity and socio-economic status. The research revealed that many households supplement their income through activities such as tourism, small-scale industries, and employment in the service sector. While these alternative income sources have improved household resilience against agricultural risks, the study also highlighted that reliance on non-agricultural income might lead to reduced investment and interest in farming,

**Singh and Rana (2018):** conducted research on the traditional agricultural knowledge of Himachal Pradesh's rural communities, exploring how these practices contribute to sustainable farming. The study found that many traditional practices, such as crop rotation, mixed cropping, and the use of organic fertilizers, have been effective in maintaining soil fertility and reducing pest attacks. The research advocated for the integration of indigenous knowledge with modern agricultural techniques to promote sustainability and resilience in farming.

**Singh et al. (2019):** examined the impact of climate change on agricultural productivity in the state, noting that changing rainfall patterns, increased frequency of extreme weather events, and shifting growing seasons are adversely affecting traditional farming systems. Their research highlighted the need for adaptive strategies, including the adoption of climate-resilient crops and improved water management practices, to mitigate the adverse effects of climate change.

**Chauhan (2020):** explored the complex interactions between socio-economic development and environmental sustainability in Himachal Pradesh. The research focused on the dual pressures of economic development and environmental conservation, especially in rural areas where agriculture is the mainstay of the economy. Chauhan argued that sustainable development in Himachal Pradesh must balance the need for economic growth with environmental protection, emphasizing the role of community-based approaches in achieving this balance.

**Devi and Kaur (2020):** explored gender dynamics within rural farming communities, focusing on the significant role women play in agricultural activities. Their study found that despite their substantial contribution, women often face inequalities in access to resources, decision-making, and land ownership. The research emphasized the need for gender-sensitive policies that recognize and enhance the role of women in agriculture, thereby improving overall socio-economic outcomes.

## Objective

1. To examine the current agricultural practices, including, irrigation methods, the use of fertilizers and pesticides, and the adoption of modern agricultural techniques.
2. To study the social problems and social status of households in the village.

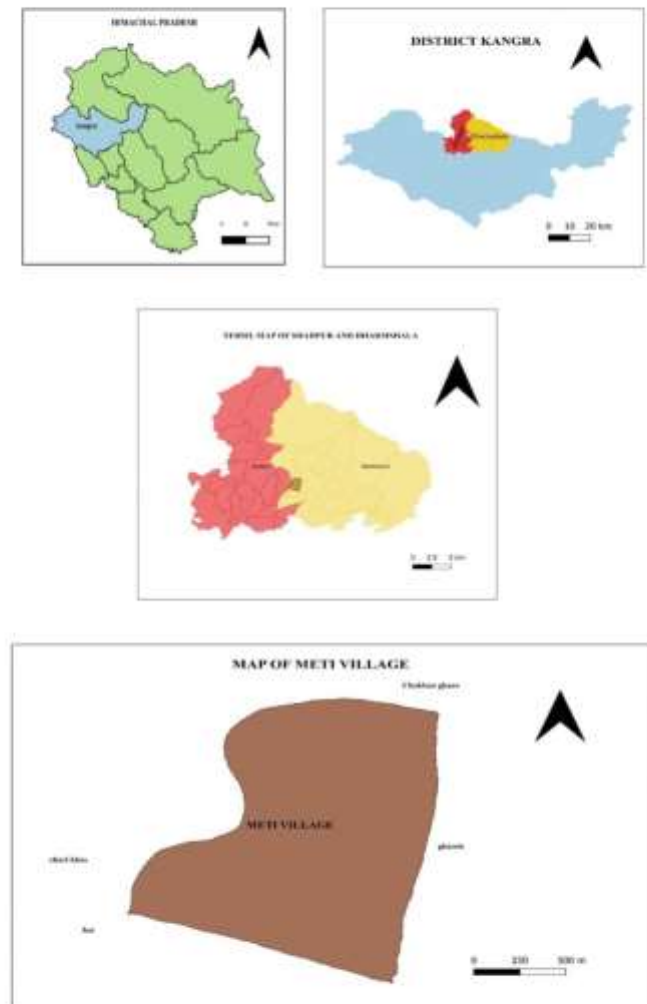
## DATA SOURCES AND METHODOLOGY

In this study, the socio-agricultural environment of Meti Village was investigated using a mixed-methods approach. In order to get primary data on farming techniques, land usage, and environmental conditions, we conducted door-to-door interviews using standardized questionnaires. MS Excel was used to arrange and examine this data in order to identify trends and patterns. To gain a deeper understanding of the experiences and opinions of local farmers, community leaders, and agricultural specialists, we also held

semi-structured interviews and focus groups with them. In order to directly document agricultural activities and environmental circumstances, observations were made. We were able to assess land usage and property borders with the aid of cadastral maps, which provided valuable spatial information. We examined previously published works, including scholarly publications and reports, to bolster and contextualize our conclusions. To find recurring themes, qualitative data was analysed. To guarantee accuracy, we double-checked results from several sources.

## Study Area

LOCATION MAP OF THE STUDY AREA



Source: QGIS 3.24.1

Meti Village is situated in Shahpur Tehsil in Kangra District of Himachal Pradesh State, India. Geographically, it is located in the northwestern part of the state with in Kangra valley, at a latitude of

32.2105 ° N and longitude of 76.2834 ° E. The Village is positioned at an elevation typical of the region, which ranges from approximately 1450 to 2500 meters (1480 to 8200 feet) above sea level. Gharoh is the gram panchayat of Meti village. The total geographical area of village is 106.73 hectares. NH 154 and NH 154A are the main national highways passing near the village. Meti has a population of 649 people, which is made up of 321 men and 328 women. Pin code of Gharoh khas village locality is 176215. When it comes to administration, Gharoh khas village is administrated by a sarpanch who is elected representative of the village by the local elections. As per 2019 stats, Gharoh khas village comes under Shahpur assembly constituency & Kangra parliamentary constituency. Dharamshala is nearest town to Gharoh khas village for all major economic activities. In the Meti village, the literacy rate is 77.20 per cent of which 81.62 per cent of males are literate and 72.87 per cent of females are literate. There are about 138 homes within this village. The area benefits from temperate climates, moderate temperatures and seasonal rainfall that influence its agricultural practices.

### **Climate**

Meti Village in the Kangra district of Himachal Pradesh experiences a temperate climate with distinct seasonal variations. Winters are cool to cold, with temperatures ranging from 2°C to 15°C (36°F to 59°F), occasionally dropping below freezing and resulting in frost. Summers are mild to warm, with temperatures ranging from 20°C to 35°C (68°F to 95°F), though heatwaves can push temperatures higher. The monsoon season, from June to September, brings significant rainfall, averaging between 1,200 to 2,000 millimeters (47 to 79 inches) annually, with temperatures ranging from 18°C to 30°C (64°F to 86°F). This period is crucial for agriculture but can also lead to challenges such as soil erosion and waterlogging. Autumn, from October to November, is characterized by cooling temperatures and generally clear skies, ranging from 15°C to 30°C (59°F to 86°F). Humidity is high during the monsoon season, often exceeding 80%, while it is lower during winter and summer. These climatic conditions play a critical role in shaping agricultural practices in Meti Village, influencing crop growth and seasonal farming activities.

### **Vegetation**

The varied heights and mild temperature of Meti Village in Kangra contribute to its rich diversity of plants. Numerous crops, including cereals like wheat and maize, pulses, and a wide range of vegetables like potatoes, beans, and leafy greens, are supported by the village's rich soil and regular rainfall. Fruit trees like apple, peach, and plum are frequently grown and benefit from the temperate temperature, which is another important aspect of horticulture. A variety of deciduous and evergreen trees, typical of the lower Himalayan region, such as oak, pine, and deodar, make up the natural greenery around the settlement. The village's agrarian existence depends on the grasses and shrubs that cover the hillsides, which serve as cattle fodder. Furthermore, the surrounding woodlands are home to a variety of wild plants with therapeutic qualities, which is indicative of the area's vast biodiversity. In addition to boosting the local economy, this varied vegetation is essential for preserving the ecological balance, halting soil erosion, and preserving Meti Village's agricultural way of life.

### **Drainage pattern**

Drainage Pattern is the pattern formed by the streams, rivers, and lakes in a particular drainage basin. The pattern created by stream erosion over time reveals characteristics of the kind of rocks and geologic structures in a landscape region drained by streams. Gaj watershed is a part of Beas River drainage system of Himachal Pradesh. The unique feature about this Meti village is their water system. A river named Gaj Khad flows very near to this village. Gaj khad is a perennial river. It is considered as the lifeline of this

village as it provides water for the production of electricity, domestic purposes and agriculture and livestock also. The water of this river is utilized by the local inhabitants on regular basis.

### **Language**

The predominant language of Meti Village is Pahari, more especially the Kangri dialect, which is spoken throughout the Kangra area of Himachal Pradesh. The Indo-Aryan language of Pahari is deeply ingrained in the local culture and reflects the rich legacy and customs of the people who speak it. In daily life, Pahari is used as a communication tool in marketplaces, residences, and community events, which helps the villagers feel very much like they belong. Although

Pahari is the language of most people, Hindi is also widely used, particularly in formal settings, administration, and education. This is because Hindi is the official language of both the state and the nation. Younger generations and people working in the tourism or commercial sectors might also speak English somewhat well with Hindi and English connecting Meti Village to the larger national and international environment, and Pahari acting as a vital link to the village's cultural origins, the village's employment of these languages demonstrates the community's blend of traditional and modern influences.

### **Soil**

Meti Village in Kangra is known for its fertile soil, which plays a vital role in supporting the local agriculture. The soil in this region is primarily influenced by the local climate, topography, and vegetation, which together shape its composition and fertility. The soil here is primarily loamy, enriched with organic matter, making it ideal for growing a variety of crops such as wheat, maize, and pulses. The presence of the tributary of Beas River namely Gaj Khad nearby contributes to the soil's fertility, as the alluvial deposits from the river enhance its nutrient content. The soil's good water retention capacity, coupled with the region's favourable climate, makes Meti Village a productive agricultural area, sustaining the livelihoods of many local farmers.

### **Demographic status**

Demography is the study of human populations, in particular their size and composition and how they change through fertility (births), migration, aging, and mortality (deaths). Demography also includes analysis of the economic, social, environmental and biological causes and consequences of population change. Although demography is a discipline in its own right, it draws heavily on other fields, including biology, economics, epidemiology, geography, and sociology. Demography tends to be highly empirical, with a strong focus on data and data quality.

**Table1.1: Gender Distribution and Sex Ratio of Respondents**

S.NO.	GENDER	NO. of Respondent
1.	Male	18
2.	Female	34
<b>Total</b>		<b>52</b>

**Source: Field survey 2024**

### **Age composition**

"Age composition" as "the numerical distribution of a population according to age, which is crucial in determining a society's labour force, dependency ratio, and overall demographic characteristics." This definition highlights the essential role that age structure plays in shaping various socio-economic and demographic outcomes (Kingsley Davis,). Age composition refers to the distribution of various age groups

within a population. In demographic studies, age composition is often categorized into segments such as children (0-14 years), working-age adults (15-64 years), and the elderly (65 years and older). Analyzing age composition helps understand the population structure, which can influence various socio-economic factors like labor force participation, dependency ratios, and the demand for services such as education and healthcare.

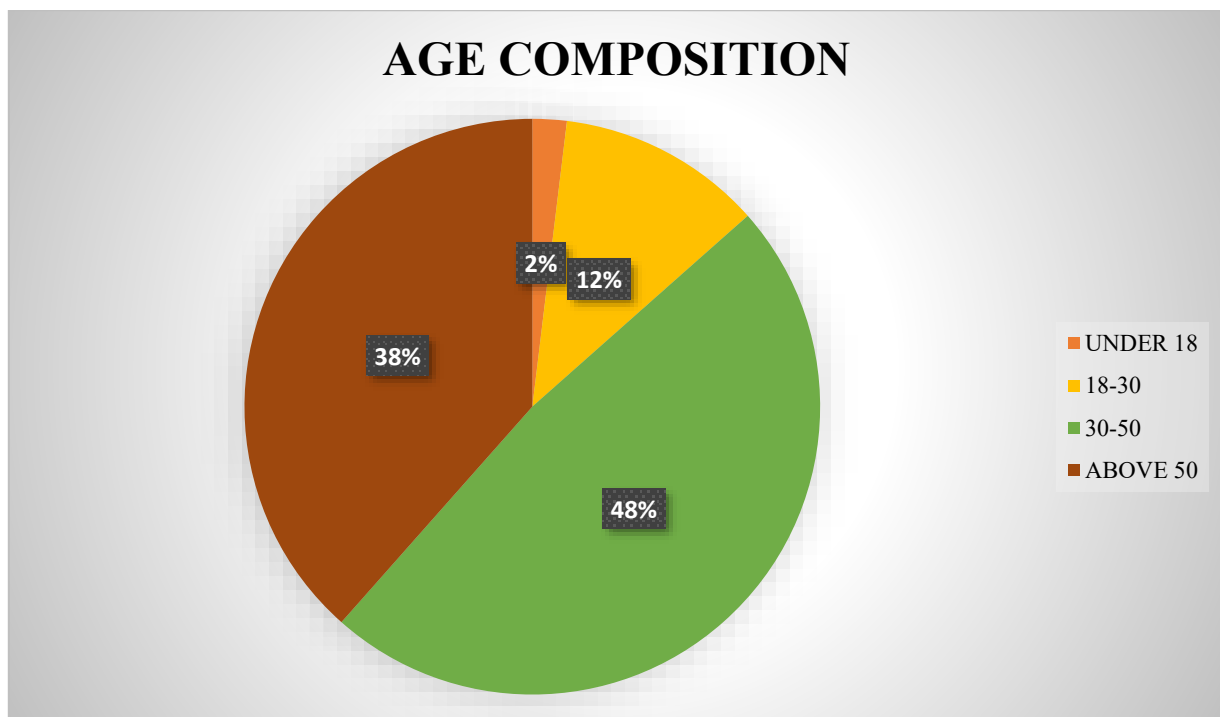
Would you like to analyze age composition data for a specific area, or do you need help with something else related to this topic

**Table1.2: Age Composition**

S. NO.	AGE GROUP	NO. OF RESPONDENT	PERCENTAGE
1	UNDER 18	1	1.9%
2	18-30	6	11.5%
3	30-50	25	48.1%
4	ABOVE 50	20	38.5%
<b>TOTAL</b>		<b>52</b>	<b>100%</b>

**Source: Field survey 2024**

For example, a higher proportion of working-age individuals indicates a potentially robust labor force and economic growth, while a greater number of dependents—children and elderly—can increase the demand for social services and healthcare. Monitoring changes in age composition helps anticipate future needs and plan accordingly. Data from censuses and surveys provide valuable insights into age distribution, enabling better planning for educational services, healthcare, and other societal needs.



**Fig. 1.1**

The survey data reveals distinct patterns in the age distribution of respondents. A negligible portion of the respondents (1.9%) are under 18, indicating minimal participation from minors.

In the 18-30 age group, 11.5% of respondents participated, showing moderate engagement from younger adults. The largest segment of respondents, nearly half (48.1%), falls within the 30-50 age group, highlighting that middle-aged adults were the most represented demographic. Additionally, a significant 38.5% of respondents are aged above 50, making them the second-largest group in the survey. Collectively, the data suggests that the survey primarily engaged participants aged 30 and above, with the majority of responses coming from middle-aged and older adults. The limited involvement of those under 30 could indicate either a lower interest or relevance of the survey's topics to the younger demographic, or perhaps their reduced availability or willingness to participate.

### House type and settlement

House type refers to the classification of residential structures, such as single-family homes or apartments, based on their design and intended use. Settlement describes a community where people live, ranging from small villages to large cities, and is defined by population size, building density, and infrastructure. The nature of a settlement often reflects the social and economic conditions of the area.

**Table 1.3: Types of households**

S. No.	Types of Household	No. of Respondents
1	Joint Family	24
2	Nucleated Family	28
<b>Total household</b>		<b>52</b>

**Source: Field survey 2024**

In 2024, the village of Meti is characterized by a diverse mix of household types, as illustrated in Table 1.3. Out of 52 households, 24 are joint families, which comprise 46.2% of the total. This suggests that nearly half of the households maintain a traditional family structure, where multiple generations live together under one roof. On the other hand, the majority of households, 28 in total (53.8%), are nucleated families. These households typically consist of a single generation, reflecting a more modern family arrangement. The nearly even distribution between joint and nucleated families highlights a balance between traditional and contemporary family structures within the village. This balance may indicate shifting social dynamics, with an ongoing transition from extended family living arrangements to more individualistic, nuclear family setups. The data on housing types among the respondents reveals a clear trend towards more durable and modern structures. Specifically, 68% of respondents live in pucca houses, which are constructed from robust materials like brick and concrete, suggesting a higher level of infrastructure development and stability within the community. In contrast, only 7.8% of respondents reside in kuccha houses, made from less durable materials such as mud and straw, indicating a smaller proportion of traditional housing. Additionally, 24% of respondents live in mixed houses, which incorporate both traditional and modern materials, reflecting a transitional approach in housing construction. Overall, the predominant presence of pucca houses highlights a significant shift towards more permanent housing solutions.

### Kaccha House



**PHOTO PLATE- I**

Source: captured by author 2024

### Mixed House



### Pucca House



**Photo plate- II**

Source: captured by author, June 2024

### Level of Education

The "level of education" refers to the highest stage of formal education individuals have completed, ranging from no formal education to advanced degrees. This includes categories such as primary, secondary, higher secondary, post-secondary, and tertiary education. The data indicates a relatively educated population in Meti village, with the majority of respondents (44.2%) having completed secondary education, suggesting that high school education is most prevalent.

**Table1.4: Level of Education**

S. No.	Level of Education	No. of Respondent	Percentage (%)
1.	Primary	6	11.5
2.	Secondary	23	44.2
3.	Graduation	12	23.1
4.	Post Graduation	6	11.5
5.	None	5	9.6
<b>Total</b>		<b>52</b>	<b>100%</b>

Source: Field survey 2024

A smaller proportion has achieved graduation (23.1%) or pursued post-graduation (11.5%). Conversely, 11.5% of respondents have completed only primary education, and 9.6% have no formal education. This distribution highlights the varied educational backgrounds within the village, with a significant number having attained at least secondary education.

### Agriculture

Agriculture is the practice of cultivating soil, growing crops, and raising animals for food, fiber, and other products. It includes activities such as planting, harvesting, and managing farm operations, crucial for providing sustenance and supporting economic and environmental sustainability. Modern agriculture also encompasses technological advancements such as mechanization, biotechnology, and sustainable farming practices aimed at increasing efficiency and reducing environmental impact. Additionally, agriculture plays a critical role in the economy, providing employment, raw materials for industry, and contributing to food security. With the growing global population, agriculture faces challenges such as land degradation, water scarcity, and climate change, making the adoption of innovative and sustainable practices increasingly important for ensuring future food production. The document outlines various aspects of agriculture, starting with types such as subsistence, commercial, organic, and sustainable agriculture. Subsistence farming is small-scale and traditional, primarily for local consumption, while commercial agriculture is large-scale, focused on production for sale, and often involves modern technology. Organic farming emphasizes sustainability, avoiding synthetic inputs, and promoting biodiversity, whereas sustainable agriculture aims for long-term productivity with minimal environmental impact.

**Table 1.5: Distribution of Farming Experience Among Respondents**

S.NO.	Duration of Farming Experience	Number of Respondents	Percentage (%)
1.	Less than 1 year	3	5.8
2.	1-5 years	3	5.8
3.	6-10 years	4	7.7
4.	More than 20 years	36	69.2
5.	None	6	11.5
<b>Total</b>		<b>52</b>	<b>100%</b>

Source: Field survey 2024

The data on farming experience among respondents indicates that a significant majority, 69.2%, have over 20 years of experience, highlighting a deep-rooted agricultural background. A smaller portion of respondents, 7.7%, have 6 to 10 years of experience, while 5.8% each have either less than one year or 1 to 5 years of farming experience. Notably, 11.5% of respondents have no farming experience, suggesting the presence of non-farmers or individuals engaged in other occupations. Overall, the data reflects a community with a strong agricultural foundation, complemented by a minority of newer or inexperienced farmers.

**Table: 1.6 Farm Size and Distribution Among Respondents**

Area of Agricultural Land	Number of Respondents	Percentage (%)
Less than 1 hectare	27	51.9
1-5 hectares	16	30.8
6-10 hectares	3	5.8
More than 10 hectares	2	3.8
No agricultural land	4	7.7
<b>Total</b>	<b>52</b>	<b>100%</b>

**Source: Field survey 2024**

The data on farm size distribution among respondents reveals that the majority (51.9%) are small-scale farmers, owning less than 1 hectare of land. A notable portion (30.8%) operates medium-sized farms between 1 to 5 hectares, while only a small percentage (5.8%) manage larger farms of 6 to 10 hectares. Very few respondents (3.8%) have more than 10 hectares, indicating that large-scale farming is uncommon.

**Agriculture Land: METI**



**Photo plate - III**

**Source: captured by author, June 202**

Overall, the distribution of landholdings highlights a concentration of small and moderate land ownership, with few individuals controlling larger areas, which may influence the economic and agricultural dynamics within the community.

**Olericulture: METI**



**Photo plate- IV**

**source: captured by author 2024**

Additionally, 7.7% of respondents do not own any agricultural land, suggesting that some individuals may be engaged in non-agricultural activities. Overall, the community is predominantly composed of small-scale farmers, with a minority involved in larger or non-agricultural enterprises.

**Farming Types and Crops**

The data shows that mixed farming is the most common practice among respondents, with 69.2% engaging in both crop and livestock farming. This integrated approach is preferred, likely due to its ability to balance the risks and benefits of different agricultural activities. In contrast, 13.5% of respondents are exclusively involved in crop farming, while 5.8% focus solely on livestock. Additionally, 11.5% of respondents do not participate in any farming activities, suggesting that some individuals are engaged in other forms of livelihood or may be landless. This distribution highlights the community's strong inclination towards mixed farming, while also reflecting a range of other agricultural and non-agricultural occupations.

**Types of Crops**

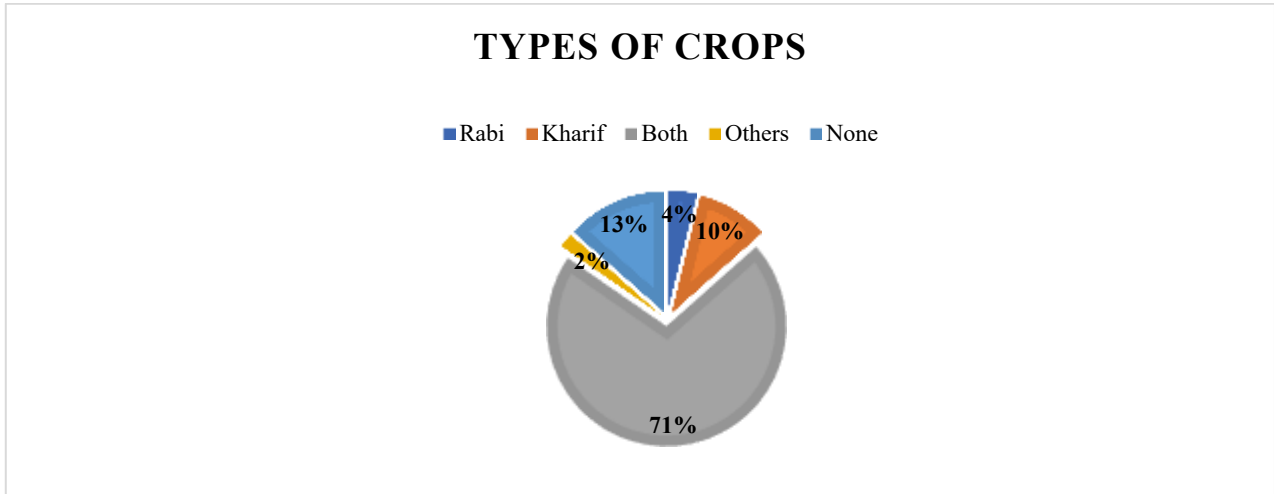
Crops are plants cultivated for food, fiber, or other purposes. They include Rabi crops (grown in winter), Kharif crops (grown in monsoon), and various types like cereals, legumes, oilseeds, root vegetables, and fruits for different uses.

**Table1.7: Types of crops**

Crops	No. of Respondents	Percentage (%)
Rabi	2	3.8
Kharif	5	9.6
Both	37	71.2
Others	1	1.9
None	7	15.5
<b>Total</b>	<b>52</b>	<b>100</b>

**Source: Field survey 2024**

The data shows that most respondents (71.2%) grow both Rabi and Kharif crops, using both the winter and monsoon seasons for their farming. A smaller group focuses only on Kharif crops (9.6%), and an even smaller group on Rabi crops (3.8%). About 1.9% of respondents grow other types of crops not listed in Rabi or Kharif.



**Figure 1.2**

Additionally, 15.5% do not grow any crops, suggesting they might be involved in different types of farming or other activities. This indicates a strong preference for growing crops in both seasons and a variety of farming practices in the community.

### Farming Method and Techniques

Farming methods and techniques are diverse practices and strategies used to cultivate crops and rear animals, ranging from traditional approaches to modern technological solutions.

**Table:1.8 Farming Method**

Faming Method	No. of Respondent	Percentage (%)
Traditional farming	20	38.5
Organic farming	5	9.6
Integrated farming	22	42.3
None	5	9.6
Total	52	100

**Source: Field survey 2024**

Integrated farming is the most common practice, used by 42.3% of respondents, reflecting a preference for combining various agricultural approaches. Traditional farming is also widely practiced, with 38.5% of respondents relying on time-tested methods. Organic farming is less prevalent, with only 9.6% of respondents focusing on chemical-free techniques. Additionally, 9.6% of respondents do not participate in any farming, suggesting alternative occupations or reasons for non-engagement in agriculture. This distribution indicates a strong inclination towards integrated and traditional farming methods, with a smaller, emerging interest in organic practices.

In Meti Village, nearly half of the sample relies on tractors and machinery (53.8%), indicating a strong dependence on mechanized farming methods that enhance efficiency and productivity. A smaller proportion (17.3%) utilizes irrigation systems, which, while significant, are less widespread and focus on improving water management for crops. Another 17.3% employ a combination of agricultural tractors and irrigation systems, reflecting a comprehensive approach to optimizing available resources for better farming practices. Conversely, a notable percentage still adheres to manual and traditional farming methods, highlighting a divergence from the prevalent mechanization and irrigation practices. This distribution demonstrates that most farmers in Meti Village favour mechanization, with irrigation and a combined approach as secondary strategies for enhancing their agricultural practices.

### **Livestock**

Livestock are domesticated animals raised for various purposes on farms and ranches. They are primarily kept for their products, such as meat, milk, wool, or eggs, and can also serve labour roles like Ploughing fields or transporting goods. Key types of livestock include cattle for beef or dairy, sheep for meat (lamb or mutton), wool, and sometimes milk, goats for meat (chevon), milk, and fiber, pigs for pork, poultry (chickens, turkeys, ducks, and geese) for meat and eggs, and horses for riding, work, and occasionally meat.

The data from Table 1.9 reveals that cattle are the predominant type of livestock in Meti Village, with 55.8% of respondents raising them. This reflects the high value placed on cattle for their meat and dairy products. In contrast, sheep and poultry are absent from the village, as no respondents reported keeping these animals. Goats are raised by 11.5% of respondents, indicating a smaller but notable presence.

**Table: 1.9 Livestock**

<b>Livestock Type</b>	<b>No. of Respondents</b>	<b>Percentage (%)</b>
Cattle	29	55.8
Sheep	0	0
Goat	6	11.5
Poultry	0	0
None	17	32.7
<b>Total</b>	<b>52</b>	<b>100</b>

**Source: Field survey 2024**

Additionally, 32.7% of respondents do not keep any livestock, suggesting that a significant portion of the population may rely on other forms of income or agricultural practices that do not involve livestock. Overall, the data highlights a clear preference for cattle and a lack of interest or feasibility in raising sheep and poultry.

### Livestock activities in the village



**Photo plate - V**

**Source: captured by author, June 2024**

### Irrigation

Irrigation is the practice of supplying water to crops and plants using methods like sprinklers, drip systems, or flowing water to ensure they get enough moisture. This helps grow plants in areas with limited or inconsistent rainfall and improves crop yields. The Kuhl irrigation system in the Kangra valley of Himachal Pradesh is a remarkable example of traditional community-managed gravity flow irrigation. This system plays a crucial role in supporting agriculture in the region, allowing farmers to efficiently utilize water resources in the challenging Himalayan terrain.

### Irrigated crop Area



**Photo plate- VI**

**Source: captured by author 202**

**Means of Irrigation: Kuhl**



**Sprinkler Irrigation**



**Photo plate- VII**

**Source: captured by author 2024**

In Meti village, the primary source of irrigation is the traditional Kuhl system, a gravity-fed channel method that efficiently distributes water from natural streams to agricultural fields. This method is well-suited to the mountainous terrain of Himachal Pradesh and plays a crucial role in local farming practices. In addition to Kuhl irrigation, farmers in Meti also utilize modern sprinkler systems, which provide flexibility and precision in water application, complementing the traditional methods. Rainfall is another significant source of irrigation.

### **Fertilizer**

Fertilizer is a substance that supplies essential nutrients to plants, enhancing soil fertility and promoting growth. It can be organic or synthetic, depending on its source. The data in Table 1.10 reveals the fertilizer usage patterns among respondents in Meti village. A small percentage, 3.80%, rely solely on chemical fertilizers, indicating a limited preference for synthetic options, which could be due to concerns about soil health or environmental impact. Organic fertilizers are used exclusively by 23.10% of respondents, reflecting a notable interest in sustainable and traditional farming practices. The majority, 59.60%, combine both chemical and organic fertilizers, suggesting that these farmers seek to balance high crop yields with maintaining soil fertility.

**Table:1.10 Type of fertilizer**

<b>Type of fertilizer</b>	<b>No. of respondent</b>	<b>Percentage %%)</b>
Chemical fertilizer	2	3.80
Organic fertilizer	12	23.10
Both	31	59.60
None	7	13.50
<b>Total</b>	<b>52</b>	<b>100</b>

**Source: Field survey 2024**

Additionally, 13.50% of respondents do not use any fertilizers, possibly due to reliance on natural soil fertility, low-input farming practices, or economic constraints. Overall, the data shows a diverse approach

to fertilization, with a significant number of farmers opting for a mixed strategy to optimize agricultural outcomes.

### Types of Fertilizer

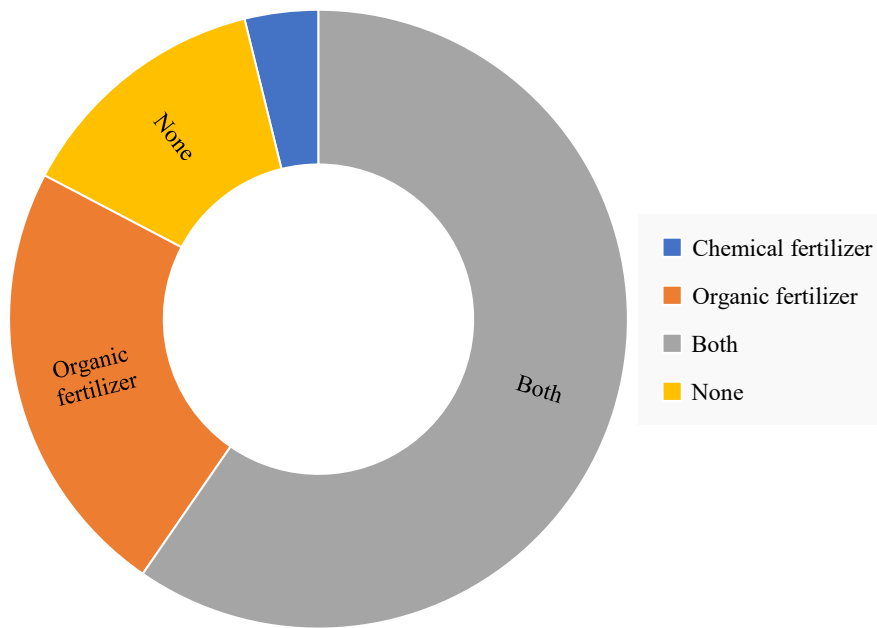


Figure 1.3

### Market and Income

Market access plays a crucial role in determining the prices that farmers can obtain for their produce, and it directly impacts their overall income. However, several challenges, such as fluctuating market prices, high transportation costs, and limited access to larger markets, often affect farmers' profitability. The village's produce is sold through different channels, including local markets, wholesale markets, and direct sales to consumers. Market access plays a crucial role in determining the prices that farmers can obtain for their produce, and it directly impacts their overall income.

Table: 2.1 Availability of Seeds

Access of quality seed and plants from HPAD	NO. of respondent	Percentage (%)
Yes	17	32.7
No	35	67.3
<b>Total</b>	<b>52</b>	<b>100</b>

Source: field survey 2024

The data on access to quality seeds and plants from the Himachal Pradesh Agriculture Department (HPAD) indicates that a significant majority of respondents in Meti village do not have access to these resources.

Specifically, out of 52 respondents, only 17 individuals (32.7%) reported having access to quality seeds and plants from HPAD, while a larger portion, 35 respondents (67.3%), do not have access.

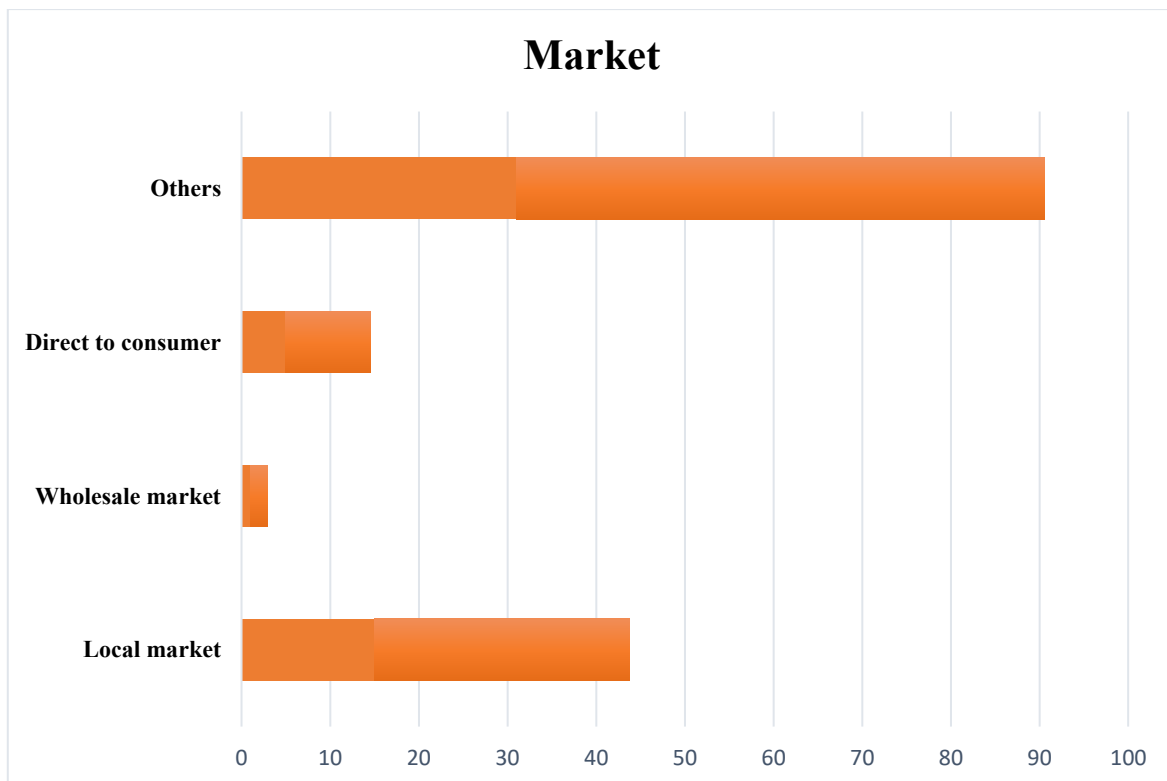
This disparity suggests that a considerable number of farmers in Meti village may be facing challenges in obtaining high-quality agricultural inputs, which could affect their productivity and overall agricultural outcomes. The limited access to quality seeds and plants may be due to several factors, such as distribution inefficiencies, lack of awareness, or logistical challenges in reaching remote areas.

The fact that over two-thirds of the respondents do not have access to these essential resources highlights the need for improved distribution mechanisms or outreach programs by the HP Agriculture Department. Enhancing access to quality seeds and plants could potentially boost crop yields, improve food security, and increase income for farmers in the region.

**Table: 2.2 Market**

Market	Respondents	Percentage (%)
Local market	15	28.8
Wholesale market	1	1.9
Direct to consumer	5	9.6
Others	31	59.6
<b>Total</b>	<b>52</b>	<b>100</b>

Source: field survey 2024



**Figure 1.4**

Farmers in Meti village use a variety of market channels to sell their produce, with 28.8% relying on local markets and only 1.9% on wholesale markets. A smaller group, 9.6%, sells directly to consumers, while

the majority, 59.6%, use alternative or informal channels. This suggests a flexible approach to marketing, with many farmers exploring options beyond traditional markets to maximize their sales.

### **Farming challenges**

Farming in Dharamshala, Himachal Pradesh, is fraught with challenges that stem from the region's mountainous terrain, unpredictable climate, and socio-economic factors. The hilly landscape limits the availability of arable land and complicates the use of modern farming equipment, often forcing farmers to rely on manual labor. Soil erosion and landslides, particularly during the monsoon season, further degrade the land's fertility and can destroy crops. Water scarcity is another critical issue, exacerbated by inconsistent rainfall and reliance on traditional irrigation methods like Kuhl systems. Climate change has made weather patterns increasingly unpredictable, leading to periods of drought or excessive rainfall that negatively impact crop yields.

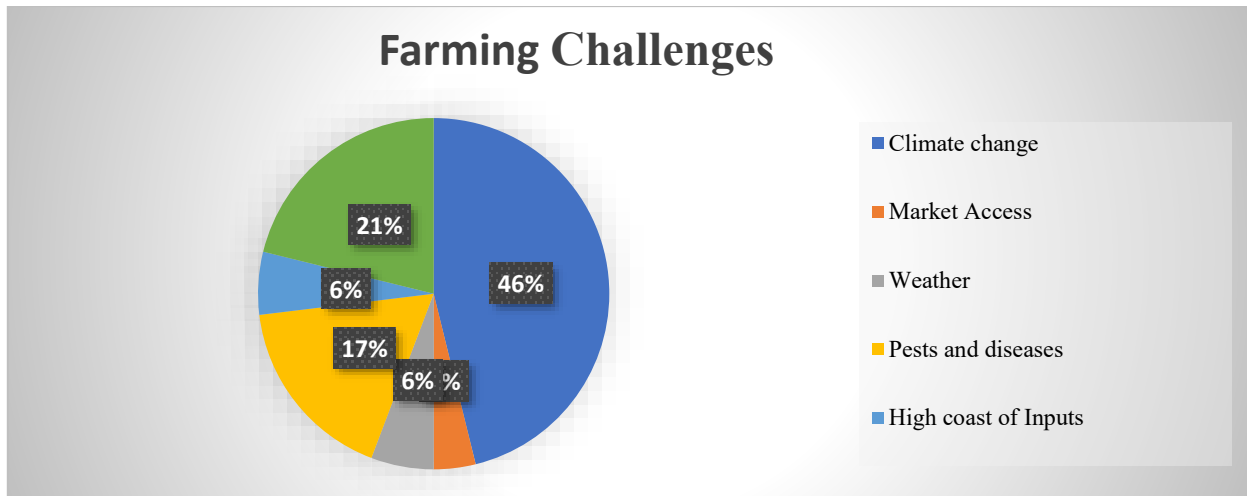
Additionally, the prevalence of small landholdings limits farmers' ability to scale up their operations, making it difficult to adopt modern farming practices that could enhance productivity. Access to modern agricultural technology and equipment is also limited, hindering progress and innovation. Farmers face significant challenges in transporting their produce to markets due to the region's rugged terrain and inadequate infrastructure, which can result in post-harvest losses and lower profits. Wildlife encroachment, particularly from monkeys and wild boars, adds another layer of difficulty, as these animals often damage crops. Furthermore, the migration of younger generations to urban areas in search of better opportunities has led to a labor shortage in agriculture, leaving many farms understaffed and struggling to maintain productivity. These factors combine to make farming in Dharamshala a complex and often arduous endeavor, requiring resilience and adaptability from the local farming community.

**Table: 2.3 Distribution of Farming Challenges Faced by Respondents**

<b>Challenges in Farming</b>	<b>Respondent</b>	<b>Percentage (%)</b>
Climate change	24	46.2
Market Access	2	1.9
Weather	3	5.8
Pests and diseases	9	17.3
High cost of Inputs	3	5.8
Both climate change and pests and diseases	11	21.2
<b>Total</b>	<b>52</b>	<b>100</b>

**Source: field survey 2024**

The data in the table highlights the various challenges faced by farmers, with climate change emerging as the most significant issue. Approximately 46.2% of respondents identified climate change as a major challenge, reflecting its profound impact on agricultural productivity and practices. Pests and diseases also pose a substantial problem, affecting 17.3% of the farmers, indicating ongoing concerns about managing these threats to crop health. Additionally, 21.2% of respondents reported dealing with both climate change and pests and diseases simultaneously, suggesting that these issues often compound and exacerbate the difficulties faced by farmers.



**Figure 1.5**

In contrast, weather-related issues and high costs of inputs were each cited by 5.8% of respondents, highlighting that while these factors are less dominant, they still affect a segment of the farming community. Market access was noted by only 1.9% of respondents, making it the least reported challenge. This suggests that, although market access remains a concern, it is less pressing compared to other challenges. Overall, the data underscores that climate change is the predominant challenge for farmers, with pests and diseases also being significant issues, while weather, input costs, and market access play lesser roles.

### Government Assistance in Agriculture

In Meti Village Dharamshala, Himachal Pradesh, farmers face many challenges due to the specific geographical and climatic conditions of the region. To support these farmers, government assistance can play an important role in addressing their specific needs and increasing agricultural productivity.

**Table 2.4: Respondents Opinions on Government Assistance**

Government Support	Respondent	Percentage (%)
Yes	4	7.7
No	48	92.3
<b>Total</b>	<b>52</b>	<b>100</b>

Source: Field survey 2024

The data presented in the table 2.4 highlights a significant gap in perceived government support for farmers. Only 7.7% of the respondents believe that the government provides adequate assistance for agriculture, suggesting that a small fraction of farmers feel the current support meets their needs. In stark contrast, a substantial 92.3% of respondents feel that government support is insufficient, indicating a widespread dissatisfaction with the level of assistance provided.

The government should provide various programs and services to help farmers overcome barriers such as climate change, pest management, and market access. Government initiatives in Meti village should include financial assistance through subsidies and grants to reduce the high costs of inputs such as seeds, fertilizers, and equipment. This financial assistance will help reduce the economic burden on farmers and

make agriculture more sustainable. Additionally, investment in irrigation infrastructure will be needed to improve water availability, which will be critical to the diverse crop needs of the region.

**Table 2.5: Membership in Farmers' Associations or Cooperatives**

Membership in Farmers association or cooperative society	Respondent	Percentage (%)
Yes	4	7.7
No	48	92.3
<b>Total</b>	<b>52</b>	<b>100</b>

The data presented in Table 2.5 reveals that a significant majority of farmers are not involved in organized agricultural groups. Specifically, only 7.7% of respondents are members of farmers' associations or cooperative societies, indicating limited participation in these organizations. In contrast, a substantial 92.3% of respondents do not belong to any such group, reflecting a high level of non-involvement. With a total of 52 respondents, the data underscores a notable gap in membership, suggesting that many farmers may not be benefiting from the support and resources typically provided by these associations and cooperatives. This highlights a potential opportunity for increasing engagement and exploring ways to encourage more farmers to join these collective groups.

**Environmental Awareness and Practices**

Meti village, Environmental Awareness and Practices refers to the understanding and actions taken by the community regarding environmental issues and sustainability. This includes how concerned villagers are about environmental challenges such as climate change, deforestation, water pollution, and air pollution. It also encompasses their daily practices related to environmental conservation, such as the use of reusable bags, bottles, and containers, efforts to conserve energy and water, and the choice of transportation modes. Additionally, it involves their engagement with renewable energy sources like solar power and their methods for managing household waste, whether through recycling, burning, or burying. This concept captures both the level of awareness about environmental issues and the specific actions taken by the residents of Meti village to address and mitigate environmental impacts.

**Table:2.6 Distribution of Environmental Concern Among Respondents**

Environmental Concern	Respondents	Percentage
Very Concerned	26	50.0%
Somewhat Concerned	21	40.4%
Neutral	5	9.6%
<b>Total</b>	<b>52</b>	<b>100%</b>

**Source: Field survey 2024**

The data shows that 50.0% of respondents are very concerned about environmental issues, indicating a high level of awareness and urgency within the community. Meanwhile, 40.4% are somewhat concerned, suggesting that while they recognize the importance of environmental matters, their level of concern is moderate. A small portion of respondents, 9.6%, are neutral, reflecting minimal engagement with

environmental issues. Overall, the majority of respondents (90.4%) demonstrate some degree of concern, highlighting a prevalent awareness of environmental challenges in the population.

**Table 2.7: Environmental Concerns and Combined Issues**

Environment Concern	Respondent	Percentage (%)
Climate change	38	73.0
Deforestation	8	15.3
Air pollution	1	1.9
Overpopulation	0	0
Water pollution	0	0
Climate change + Deforestation	1	1.9
Deforestation + Air pollution + Overpopulation + water pollution	1	1.9
Climate + water pollution	2	3.8
Climate change + Air Pollution + water pollution	1	1.9
<b>Total</b>	<b>52</b>	<b>100.0</b>

Source: Field survey 2024

The data from the table reveals that climatic change is the most pressing environmental concern among the respondents in Meti village, with 73% identifying it as their primary issue. Deforestation follows as a significant concern for 15.3% of the respondents, while air pollution is a worry for only 1.9% of them, suggesting it is a less prominent issue. There is no specific data for water pollution and overpopulation alone, indicating these may be lower priorities or less frequently identified in isolation.

When examining concerns that overlap, 1.9% of respondents are concerned about both climatic change and deforestation. Similarly, 1.9% are worried about all four issues combined: deforestation, air pollution, overpopulation, and water pollution. Another 3.8% express concern about both climatic change and water pollution. Lastly, 1.9% are concerned about climatic change along with air and water pollution.

**Table 2.8: Reusable Items Usage Statistics**

Reusable Items	Respondents	Percentage (%)
Always	9	17.3
Often	7	13.5
Sometimes	15	28.8
Never	21	40.4
<b>Total</b>	<b>52</b>	<b>100.0</b>

Source: Field survey 2024

The data presented in the table titled "Reusable Items: Usage Frequency and Distribution" reveals diverse patterns in the use of reusable items among the respondents. Only 17.3% of respondents use reusable items consistently, indicating a commitment to sustainability among a small segment of the population. A further

13.5% frequently incorporate reusable items into their routine, demonstrating moderate engagement. The largest group, 28.8%, uses reusable items occasionally, suggesting that while they may recognize the benefits, their usage is not a regular habit. Notably, 40.4% of respondents do not use reusable items at all, pointing to a significant portion of the population that does not practice this form of environmental conservation. Overall, the data highlights a substantial opportunity for increasing awareness and promoting the advantages of reusable items to encourage more consistent adoption among the respondents.

**Household Waste Management Practices**

Household waste management refers to the practices and methods employed by individuals and families to handle, dispose of, and reduce waste generated within their homes. Effective waste management is crucial for maintaining environmental health, reducing pollution, and promoting sustainability.

In many communities, waste management practices include burning, recycling, and burying waste. Burning waste involves incinerating refuse to reduce its volume, but it can lead to air pollution if not managed properly. Recycling involves separating and processing waste materials to be reused, thereby conserving resources and reducing landfill use. Burying waste, often in the form of composting organic materials, helps in the natural decomposition process but requires proper management to avoid environmental contamination. The data from the table on household waste management methods reveals that burning is the dominant method used by the respondents, with 96.2% of them disposing of their waste through incineration. This high percentage suggests that burning is the most common practice, likely due to its immediate effectiveness in reducing waste volume.

**Table: 2.9: Household waste management methods**

Householdwaste management method	Respondents	Percentage (%)
Burn	50	96.2
Recycle	2	3.8
Burn into the ground	-	-
<b>Total</b>	<b>52</b>	<b>100</b>

**Source: Field survey 2024**

In contrast, only 3.8% of respondents engage in recycling, indicating that recycling is not widely adopted in this community. This low rate of recycling suggests possible gaps in awareness or availability of recycling facilities. Overall, the data highlights a significant reliance on burning for waste disposal and points to a need for increased recycling practices and awareness to promote more sustainable waste management. Additionally, launching awareness campaigns to highlight the environmental and health impacts of burning waste can motivate individuals to adopt more sustainable practices. Developing local infrastructure for waste collection and recycling, in collaboration with local authorities, will provide practical alternatives to burning. Promoting composting of organic waste not only reduces the volume of waste but also benefits local agriculture. Finally, seeking partnerships with governmental bodies and NGOs to implement comprehensive waste management programs and offer necessary resources and training will further support the transition to more sustainable waste management practices, leading to positive environmental and health outcomes for the community.

### Mode of Transportation

The term "mode of transport" refers to the various methods used to move people or goods from one location to another. Common modes include road transport (cars, buses), rail transport (trains), air transport (airplanes), and water transport (ships, boats). Public transport options like buses and trains are available for general use, while non-motorized transport includes walking and cycling. The choice of transport mode depends on factors such as distance, speed, cost, and the type of cargo or passengers. In rural or less-developed areas, where public transportation infrastructure might be limited, road transport becomes more relevant. Cars and trucks offer the flexibility needed for varying distances and types of cargo. In regions with extensive waterways, inland water transport such as barges and riverboats can be highly effective, providing an alternative to overland transport.

Non-motorized modes, such as walking and cycling, are especially relevant in areas where short trips are common and there is a need to reduce environmental impact. These methods are practical in smaller communities or urban areas with adequate cycling infrastructure, promoting sustainability and health.

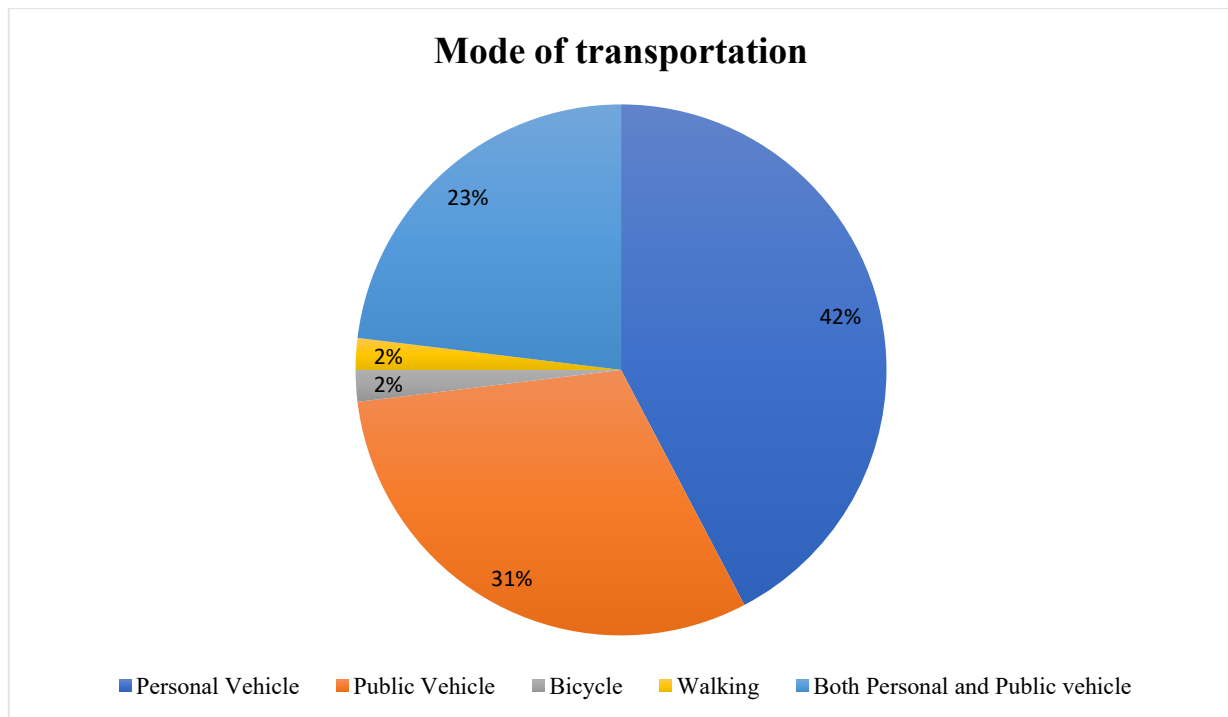
Each mode of transportation is chosen based on its alignment with the specific needs of the journey, considering factors like distance, cost, speed, environmental impact, and infrastructure availability. This interplay ensures that transportation systems are optimized for the diverse requirements of different settings.

**Table: 2.10 : Primary mode of Transportation**

Primary mode of transportation	Respondents	Percentage
Personal Vehicle	22	42.3
Public Vehicle	16	30.8
Bicycle	1	1.9
Walking	1	1.9
Both Personal and Public vehicle	12	23.1
<b>Total</b>	<b>52</b>	<b>100.0</b>

**Source: Field survey 2024**

The data in Table 2.7: Primary Mode of Transportation reveals that personal vehicles are the most commonly used mode of transport, with 42.3% of respondents relying on them for their daily commute. Public vehicles are also widely used, with 30.8% of respondents depending on them, indicating a significant reliance on public transport systems. Additionally, 23.1% of respondents use a combination of both personal and public vehicles, suggesting a need for flexibility in their transportation choices.



**Figure 1.6**

In contrast, only 1.9% of respondents use bicycles or walk as their primary mode of transport, highlighting a minimal engagement with these more sustainable options. Overall, the data suggests a strong preference for motorized transport, with limited use of non-motorized methods

### Summary

This study explores the interplay between socioeconomic factors, agricultural methods, and environmental awareness in Meti village, Dharamshala. Using a mixed-methods approach combining surveys and qualitative interviews, the research assesses villagers' environmental consciousness, farming challenges, and the effectiveness of government support. Findings reveal that while the community is highly aware of environmental issues like deforestation and climate change, they face significant farming difficulties such as pests and erratic weather, with minimal government assistance. The study notes a wide range of environmental practices among villagers, including some reliance on traditional methods like waste burning, and highlights the limited adoption of renewable energy. The study concludes that increased government support and enhanced community awareness of sustainable practices are essential for improving agricultural productivity and maintaining ecological balance in the village. The research on Meti village reveals a community with a blend of traditional and modern agricultural practices. Families are mostly joint or nucleated, and education levels vary, with many having secondary education. Agriculture is a primary occupation, dominated by small-scale mixed farming. Farmers primarily use the traditional Kuhl irrigation system, complemented by modern sprinklers, and a mix of chemical and organic fertilizers. Livestock farming focuses on cattle, with limited engagement in other livestock. Challenges include climate change and pest issues, while market access remains relatively limited. Government support is perceived as inadequate, and there is minimal involvement in farmers' associations. Environmental concerns on climate change, with limited use of reusable items and prevalent waste burning. Overall, the village exhibits a need for improved resources and support to address agricultural and environmental challenges.

## CONCLUSIONS

The Meti village exhibits a combination of traditional and modern agricultural methods, reflecting a transitional phase in farming practices.

The community has varying levels of education, with a predominant focus on secondary education, and families often follow joint or nuclear structures.

Farmers face challenges such as climate change, monkey, pest issues, and limited market access, which impact their agricultural productivity and livelihood.

The use of traditional Kuhl irrigation systems alongside modern sprinklers, and a mix of chemical and organic fertilizers, indicates a hybrid approach to farming.

Livestock farming is primarily centred around cattle, with less emphasis on other types of livestock. There is a perceived lack of adequate government support and minimal involvement in farmers' associations, which could hinder collective progress and resource sharing.

Environmental issues, including climate change and waste management practices, are significant, with limited use of reusable items and prevalent waste burning.

The village requires enhanced resources and support to effectively address agricultural and environmental challenges and to improve overall community welfare.

Market access presents challenges, with a significant portion of farmers lacking access to quality seeds and plants from the Himachal Pradesh Agriculture Department.

Fertilizer usage is diverse, with many farmers opting for a combination of chemical and organic fertilizers to balance productivity and sustainability.

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