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"Cannabis Farming In Malana: A Socio-Legal Study Of Culture, Environment, And Law With A Comparative Perspective From Canada"

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Abstract
Cannabis cultivation in the remote Himalayan village of Malana has long been integral to local culture and economy, yet it conflicts with India's national narcotics laws. This paper provides a socio-legal analysis of Malana's cannabis tradition, examining cultural norms, environmental impacts, and legal frameworks. It integrates case studies and official reports to describe how Malana's unique self-governance and historic practices clash with the Narcotic Drugs and Psychotropic Substances (NDPS) Act (1985). The study also compares India's approach with Canada's legalized model, highlighting regulatory differences and outcomes. We review literature on Himalayan cannabis heritage, environmental studies of high-altitude cultivation, and cannabis policy. Key findings include that Malana's harsh terrain leaves few viable crops besides cannabis and that eradication efforts drive illicit plantations into fragile forests, causing erosion. The Canadian experience shows that strict regulation and legal markets can reduce illicit trade, though challenges remain. Finally, we identify gaps in research on socio-environmental trade-offs and propose policy recommendations for India, such as permitting controlled hemp cultivation with local safeguards and investing in alternative livelihoods.

Keywords: Cannabis, NDPS Act 1985, Illicit Plantation, Sustainable Development, Self-governance, High-altitude cultivation, Hemp.

INTRODUCTION

Cannabis (*Cannabis sativa L.*) has been cultivated in the Himalayas for centuries, serving diverse social, economic, and cultural roles[1]. In Malana, Himachal Pradesh, cannabis (Hash or *charas*) yields historically sustained local livelihoods through rope-making, textiles, and export of the famed "Malana Cream" hash[2]. Its cultivation is intertwined with religious practices for example, offerings to the village deity Jamlu and traditional governance, which is believed to be the world's oldest republic[3]. However, modern Indian law largely criminalizes cannabis resin and flowers[4], creating a socio-legal conflict ; Malana's residents view cannabis as their only viable cash crop in extreme terrain, but enforcement of the NDPS Act 1985 outlaws their primary livelihood. Environmental concerns also emerge, as fields planted on steep forest edges risk soil erosion and ecological degradation.

This paper investigates the complex interplay of culture, environment, and law in Malana's cannabis farming. It asks how local traditions and geography have shaped cultivation practices, what environmental impacts arise in the fragile Himalayan ecosystem, and how India's legal framework governs cannabis. To situate these issues globally, we compare India's approach with Canada's regulated cannabis model. Canada legalized adult-use cannabis in 2018 under the *Cannabis Act*, establishing strict controls on production, sale, and possession[5]. Examining Canada highlights alternative policy options and potential lessons for India. This study thus aims to fill a research gap by linking anthropological, environmental, and legal perspectives on cannabis in Malana and elsewhere.

LITERATURE REVIEW

Research on Malana's cannabis culture is sparse in academic journals, but media reports and ethnographic accounts provide insight. Early documentation (Bangroo) describes Malana as a "lost utopia" with unique institutions and a local cannabis-based economy[6]. Mainstream articles note that cannabis was long legal locally ; historical records and local officials confirm the colonial-era taxes on cannabis, and that *"the plant is part of their tradition"*[7]. However, contemporary law has criminalized hashish production, driving an underground economy. In-depth ethnographic studies on Malana itself are lacking, representing a gap in the literature.

On the environmental front, broader literature reviews show that cannabis farming can strain resources. A narrative review finds that both indoor and outdoor cannabis growing is water-intensive and can directly contribute to soil erosion, especially on steep slopes[8]. Illegal cultivation in rugged areas often circumvents regulation, causing unmetered water withdrawals and pesticide use. This aligns with reports of Himalayan communities using cannabis for fiber and food historically, but the environmental dimension of Himalayan cannabis farming remains under-studied.

Legally, much literature focuses on national policies. India's NDPS Act (1985) prohibits cannabis resin and flowering tops, allowing only limited use of leaves (*bhang*) for traditional purposes. Section 2 of the Act bans "*production and sale of cannabis resin and flowers*", while Section 10 allows states to license hemp for medicinal/scientific purposes and Section 14 permits industrial cultivation of hemp under strict conditions. Reviews note that Uttarakhand legalized industrial hemp in 2018 to support hill. Despite these provisions, implementation is uneven and challenges persist.

Canada's legalization has been widely analyzed. Government sources outline a dual goal of protecting public health while eliminating criminal markets. Studies note increased legal access and enforcement shifts post-legalization; cannabis offences fell sharply, with most remaining offences now due to illicit export/import. However, the market share of legal supply has grown to over 70% of consumed cannabis[9]. Expert reviews acknowledge reduced criminality as a key success of cannabis legalization[10], but point to ongoing challenges such as youth usage, black market activity, and insufficient inclusion of Indigenous communities. In sum, existing literature suggests that Himalayan cannabis cultivation is historically entrenched yet legally tenuous, and that legalization in one context (Canada) yields mixed socio-legal outcomes. Gaps remain in evaluating how these dynamics play out in Malana's specific socio-ecological setting. This study addresses these gaps by combining cultural analysis with environmental impact assessment and legal review.

RESEARCH QUESTIONS

1. How does Malana's cultural and governance context influence cannabis cultivation practices?
2. What are the environmental impacts of cannabis farming in Malana's Himalayan ecosystem?
3. How do India's national and state-level cannabis policies regulate cultivation, and how do they interact with Malana's local traditions?
4. What lessons can be drawn from Canada's regulated cannabis model, and how might they inform Indian policy?

RESEARCH OBJECTIVES:

1. To Conduct a socio-legal analysis of Malana's cannabis culture and economy.
2. To assess the environmental consequences of high-altitude cannabis farming in fragile ecosystems.
3. To Examine India's legal framework NDPS Act and State rules and implementation challenges in local cultural context.
4. To compare India's prohibition-based regime with Canada's legalization approach and derive insights for policy reforms.

RESEARCH METHODOLOGY

This study adopts a qualitative, socio-legal research design based on secondary data analysis. We performed a thematic review of diverse sources like academic articles, official reports, news media, and policy documents. Key statutes such as NDPS Act 1985 and policy announcements like state hemp rules were examined. Reports from Indian news outlets provided case details on Malana's situation, while government websites detailed Canada's

framework. Environmental studies like cannabis cultivation reviews and agricultural extension materials were used to assess impacts. For the comparative component, we juxtaposed policy objectives and outcomes by reviewing Canada's legal framework and post-legalization data. Emphasis was placed on official statistics and expert reviews. Throughout, the analysis sought triangulation: multiple sources were cross-referenced to ensure credibility and to capture cultural, ecological, and legal dimensions.

CULTURAL CONTEXT AND CANNABIS FARMING IN MALANA

Malana is an ancient, isolated village in Himachal Pradesh's Parvati Valley. Locals refer to their governance as *"the Athens of the Himalayas"*, maintaining an autonomous council guided by the deity Jamlu. The Malani , the inhabitants of Malana speak Kanashi, a unique dialect, and observe strict social codes such as outsiders must not wander freely or tamper with village property[11]. Within this context, cannabis has been woven into daily life. For generations, Malanis used the entire cannabis plant ; fibers for ropes and slippers, seeds and leaves for consumption, and resin (*charas*) as cash crop. Elders recount that even British-era tax records show cannabis cultivation was once legal and taxed locally.

The village's economy historically depended on this multi-purpose plant. Elder villager Gori Massi, aged 80 notes that *"wheat and other grains don't grow on this lan. Nothing else grows here"*. In Malana's poor, stony soil and short growing season where there is pre-monsoon spring, followed by snowy and harsh winter, cannabis is the only crop which thrives wild in the Himalayas provide sufficient income to sustain households. A portion of annual life is devoted to harvesting and processing the resin. The famous 'Malana Cream' hash, renowned worldwide for its potency, has attracted foreign tourists, mostly Israelis, many of whom return to the village after completing their training or military service[12]. It remains a continued source of local pride and international interest.

Culturally, cannabis is entwined with religious practice. Jamlu is believed to approve of the crop fields are often entrusted to the god's blessings. The village temple and festivals reinforce this bond. Social norms forbid government interference in spiritual matters; for instance, the deity's oracle arbitrates village disputes, and outsiders rarely challenge this system. This self-contained culture means that national drug laws are often seen as external impositions.

At the same time, Malana is integrated into broader networks through tourism and trade. In the last two decades, global "weed tourists" have trekked to Malana to obtain Malana Cream. Numerous accounts document a steady flow of foreign and domestic visitors seeking hash. Despite the eventual closure of Malana village to tourists, cannabis connects Malana to wider markets including illegal export to Nepal and beyond[13]. Locals leverage social media and shipping services to sell products internationally. This interaction has accelerated cultivation expansion, as villagers invest effort in larger crops to meet demand.

Malana's culture revolves around cannabis as a symbol of identity and a source of income[14]. The community's unique traditions , language, governance, festivals, reinforce a worldview in which cannabis holds religious and historical significance. However, this cultural context increasingly clashes with modern legal norms, creating tension between local tradition and national law.

ENVIRONMENTAL IMPACTS IN THE HIMALAYAN REGION

The Parvati Valley and surrounding Himalayas are ecologically sensitive zones characterized by steep slopes, fragile soils, and biodiverse forests. Cannabis farming here poses specific environmental challenges. In general, cannabis is water-intensive. A review finds that outdoor cannabis requires roughly twice the water of commodity crops[15]like maize or wheat on the order of 5–6 gallons per plant per day in peak season. In mountain villages like Malana, where summer snow melt feeds streams, diverting water for irrigation can stress local supplies. Unregulated field irrigation risks depleting glacial-fed rivulets and drying springs on which wildlife depend.

Moreover, soil erosion is a major concern. Studies explicitly state that cannabis cultivation can directly contribute to soil erosion on slopes[16]. In Malana, farmers report pushing crops up into forest margins to avoid police detection. Clearing vegetation and tilling steep ravines increases sediment runoff. Illegal cannabis plantations may encroach on protected or community forests. Villagers sometimes admit having an understanding with officials to grow away from the village and into forest land where prosecutions are unlikely. Such practices, however, mean forest areas are co-opted for agriculture, fragmenting wildlife habitat. Pesticides and fertilizers used to boost yield often without guidance can leach into creeks, as documented in illegal grows globally.

Himalaya streams support endangered trout and amphibians that could suffer from agro-chemical runoff or lower water flows.

On the positive side, cannabis is often recognized for its ability to improve soil quality in some settings, particularly through phytoremediation, where it helps remove heavy metals from the soil. However, in Malana's context, the main effect is likely destructive due to scale and erosion risk. Traditional small-scale cannabis cultivation, involving a few plants per household primarily for fiber and seed, was largely sustainable and integrated with local livelihoods. However, in recent years, there has been a sharp shift toward large-scale, commercial cultivation, which has intensified environmental degradation and invited increased scrutiny from law enforcement agencies. In 2016, local government estimates reported that over 593 acres in the Parvati Valley were under cannabis cultivation, yielding nearly 12,000 kilograms of charas[17]. Reflecting this expansion, police seized 102.1 kilograms of charas in the first quarter of 2025 alone, a notable increase from 74.64 kilograms seized during the same period in 2024[18]. This sharp rise in charas seizures underscores the growing scale of cannabis production and highlights the urgent need for sustainable regulation and local engagement in policy responses. Climate factors also plays a significant role as the Himalayan climate is becoming increasingly unstable. Summer monsoons are heavier and more erratic, accelerating slope erosion, while Prolonged droughts put additional stress on water availability for crops. In this context, monoculture cannabis cultivation increases vulnerability, as a single crop failure or a landslide can severely impact a family's income. In contrast, earlier practices of mixed cropping, such as growing buckwheat and barley, provided greater ecological diversity, although they were less financially rewarding. Existing literature warns that climate change may intensify the risks associated with high-altitude cannabis farming, highlighting the urgent need for sustainable and resilient agricultural practices.

While Cannabis is known for its resilience , its extensive large-scale cultivation in Malana's fragile mountain environment brings significant environmental challenges. These include water scarcity, deforestation, soil erosion, and chemical pollution[19]. Such concerns indicate that any future policy changes, including legalization or regulated farming, must be accompanied by strong environmental safeguards. These may involve clearly defined cultivation zones, erosion control strategies, and effective watershed management to prevent further degradation of the Himalayan ecosystem.

LEGAL AND POLICY FRAMEWORK ON CANNABIS IN INDIA

Cannabis (hemp)" under Section 2(iii) of the NDPS Act, 1985, includes: (a) *charas*—the separated resin, in any form, from the cannabis plant, including hashish oil; (b) *ganja*—the flowering or fruiting tops of the cannabis plant, explicitly excluding seeds and leaves when not accompanied by the tops; and (c) any mixture of the above or any drink prepared therefrom. "Cannabis plant" means any plant of the genus *Cannabis*. In *Mohammad Jakir Nawab Ali v. State of Maharashtra* (2024), the Bombay High Court applied this definition while deciding a bail application following the seizure of 50 kg of alleged ganja from a car. The FIR, inventory, and panchnama described the material as leaves, seeds, stems, and stalks without any mention of flowering or fruiting tops required to qualify as ganja under the NDPS Act. The court found that the contraband was weighed in totality without separating the relevant parts, and thus the commercial quantity threshold under Section 20(b)(ii)(C) was not met. Consequently, the rigours of Section 37 which is non-bailable offences did not apply. Considering the accused's HIV-positive status and prolonged pre-trial detention without charges being framed, the Court granted bail. The judgment relied on precedents like *Ashok Kumar v. State of Haryana* (AIRONLINE 2021 P AND H 466), which allowed inclusion of seeds and leaves only when tops were present; *Arun Kumar Azad v. State of Haryana* (2021), where leaves alone were not considered "ganja"; and *Shri Hari Mahadu Valse v. State of Maharashtra* (2021), where ambiguity in the seized material led to doubt over commercial quantity. The Court concluded that no prima facie offence was made out.

India's cannabis policy is primarily governed by the NDPS Act, which prohibits the cultivation, sale, and possession of charas and ganja, while allowing for limited exceptions. In *Budhiyarin Bai v. State of Chhattisgarh* (2022), the Court upheld conviction under Section 20(b)(ii)(C) for possession of commercial quantity of ganja, emphasizing that no leniency should be shown in serious NDPS offences, although the sentence was reduced due to the appellant's old age and procedural lapses. The Act bans cultivation of cannabis for resin or flower but allows states to permit cultivation for industrial or medicinal use under Sections 10 and 14. States like Uttarakhand, Madhya Pradesh, and Jammu & Kashmir have invoked these provisions to legalize hemp (low-

THC cannabis) farming to support rural livelihoods. Bhang is traditionally consumed during festivals and excluded from the NDPS definition of cannabis, creating a legal and cultural dilemma since it derives from the same plant as the prohibited parts[20]. Despite growing state interest in medical and industrial use, no national-level review has re-legalized charas or ganja. Himachal Pradesh has taken initial steps by forming committees to explore regulated cannabis cultivation for medical use, explicitly excluding high-THC charas. Meanwhile, law enforcement continues to target illegal cultivation, particularly in Malana, where periodic raids are conducted on forest land[21] while private plots are often spared due to legal ambiguities. Local leaders argue that these enforcement efforts ignore tribal rights and historic taxation of cannabis by colonial authorities.

International obligations under the Single Convention on Narcotic Drugs[22] further restrict India's flexibility in reforming cannabis laws. As a result, India prohibits personal or traditional use of resin, and medical use is permitted only under strict license. This contrasts with evolving global models and complicates traditional practices. While Sections 10 and 14 provide limited powers to state governments to allow cultivation, political hesitation and lack of administrative capacity have stifled broader implementation. This legal disconnect is most stark in Malana, where the NDPS criminalizes the very product the village is known for, deepening the socio-legal conflict between cultural heritage and statutory law a core tension explored in this study.

COMPARATIVE STUDY: CANADA'S LEGAL CANNABIS MODEL

In 2018 Canada became the first major industrialized nation to legalize recreational cannabis, implementing the *Cannabis Act (2018)*[23]. Under this federal legislation, *"production, distribution, sale and possession of cannabis"* are controlled within a comprehensive framework[24]. The Act's primary goals are to keep cannabis away from youth, remove profits from criminals, and ensure adults have safe access. Adults, generally defined as individuals aged 18 and above, although provinces may set a higher minimum age, are permitted to possess up to 30 grams of dried cannabis, share limited amounts with other adults, and grow up to four plants per household from licensed seeds[25]. Home cultivation beyond four plants is illegal. Federally licensed producers, who are subject to strict standards, are responsible for growing and processing cannabis, while the systems for distribution and retail sale are operated or regulated by individual provinces.

Canada's model emphasizes strict regulation and quality control. The Act mandates plain packaging, prohibits advertising appealing to youth, and imposes standardized potency labelling. It also requires seed-to-sale tracking to prevent diversion to the black market. Provinces and territories were given leeway to add restrictions for example, raising minimum age, limiting home grow, or banning public consumption zones. Quebec is a province that has set the minimum legal age for cannabis use at 21, instead of 18, and has restricted home cultivation to a maximum of two plants per household[26].

Evaluations conducted five years after cannabis legalization in Canada reveal mixed outcomes[27]. On the positive side, there has been a significant shift in consumer behavior, with data from 2023 indicating that approximately 68 to 70 percent of cannabis consumed came from legal sources. While overall cannabis use prevalence rose moderately and reached 22 percent among Canadians aged 15 and older in 2021, there was no dramatic increase. Notably, use among youth aged 15 to 17 did not rise. Cannabis-related arrests declined sharply following legalization. By 2022, only 12 percent of related offences were for possession, a substantial decrease from approximately 80 percent prior to legalization. Most offences now involve illicit import or export. Furthermore, the regulatory framework supported economic growth, with the legal cannabis sector valued at over CAD 10.8 billion by the end of 2022[28].

Despite these gains, several challenges continue to persist. Illicit markets remain active in some parts of the country, partly due to high legal costs and the complexity of licensing procedures, particularly for small-scale producers. Health experts have expressed concern over the rising use of high-THC products and incidents of accidental ingestion by children[29], especially in cases involving cannabis edibles. Indigenous communities have also raised serious concerns, stating that they were not adequately consulted during the legalization process[30]. This has led to reports of disproportionate police scrutiny and missed economic opportunities. A parliamentary review confirmed that Indigenous groups experienced public safety challenges due to a lack of meaningful consultation and emphasized the need for more inclusive engagement moving forward.

On the environmental front, Canada's legalization of cannabis has not inherently addressed the ecological impacts of cultivation. Outdoor cultivation continues to require substantial water and may contribute to changes

in land use. Indoor cultivation, while more controlled, is subject to energy consumption concerns and is now regulated in some provinces and municipalities through green building standards for licensed grow facilities[31]. For instance, in the United States, California mandates the use of 100 percent renewable energy for licensed indoor cannabis operations. Canada, however, has not adopted such requirements uniformly. The primary regulatory emphasis has been on ensuring product safety and reducing criminal activity rather than on environmental sustainability.

Canada's model demonstrates a legal approach centered on public health and crime reduction through regulation, rather than outright prohibition[32]. The system has succeeded in reducing criminal justice interactions and building a legal industry, but also highlights issues of regulatory complexity and social equity. As compared to India, Canada's approach treats cannabis as a legitimate economic commodity, whereas India still largely criminalizes its sale[33]. The Canadian case suggests that legalization can shift cultivation out of illicit frameworks, but it requires strong institutions to manage new challenges.

SOCIO-LEGAL AND ENVIRONMENTAL CONFLICTS

The foregoing analysis reveals deep conflicts at the intersection of culture, law, and environment in Malana's cannabis story[34]. Culturally, the people of Malana regard cannabis as both an ancestral asset and a spiritual gift. Legally, it remains a prohibited substance under national law. This contradiction creates a deep conflict that is reflected in the villagers ambivalence. They are aware that their livelihood is illegal, yet they perceive the law as disconnected from their unique cultural and geographical context. One Malana villager expressed this sentiment by saying that they have to live this way, and whatever plants they grow are cut down by the police, leaving them with no choice[35]. This statement highlights a sense of fatalism among farmers who lack clear economic alternatives. Local representatives often share these views, pointing to the traditional acceptance of cannabis and the region's geographic limitations that restrict other forms of agriculture. In effect, the Narcotic Drugs and Psychotropic Substances (NDPS) Act imposes a uniform legal standard that does not consider local realities, presenting a classic socio-legal dilemma.

State enforcement frequently comes into conflict with Malana's traditional self-governance system[36]. Guided by the oracle of the deity Jamlu, villagers rely on collective consensus for decision-making and maintain a degree of autonomy. Law enforcement personnel such as police and forest officers are often perceived as outsiders, disconnected from the local socio-cultural order. Villagers allege that they have informal understandings with certain officials, who advise them to shift their cannabis fields away from the village and into nearby forested areas to avoid legal repercussions. This unofficial arrangement illustrates the existence of a legal grey area, where the state informally accommodates local livelihoods while redirecting enforcement actions. However, this compromise has ecological consequences, as relocating cultivation into forest zones contributes to environmental degradation.

The environmental degradation linked to cannabis cultivation in Malana is largely a consequence of prohibition[37]. Since growing cannabis is illegal, farmers are forced to operate covertly in remote areas, often relying on unsustainable methods. This includes overuse of water, soil erosion, and unregulated pesticide application. These patterns reflect findings from the Brookings Institution's analysis of North American illicit cannabis farms, where environmental harm is more pronounced due to the absence of oversight[38]. In Malana, fear of detection prevents farmers from investing in sustainable systems like drip irrigation or soil restoration. Moreover, proposed restrictions to only low-THC hemp under Indian policy could threaten traditional landraces and reduce biodiversity. Reports already suggest that some farmers have destroyed heirloom seeds during raids, leading to a loss of valuable genetic resources and traditional agricultural knowledge.

In contrast, Canada's legalization model shows how regulatory frameworks can mitigate both legal and environmental harms. Licensed indoor grows there are subject to standards for water use, pesticide control, and energy efficiency[39]. However, even Canada faces criticism, particularly from Indigenous communities who were insufficiently consulted. This parallels Malana's situation, where a self-governing tribal structure rooted in cultural and religious norms clashes with centralized enforcement under the NDPS Act. Canada's experience highlights that legalization, while promising, must be locally adaptive and socially inclusive. For India, successful reform would require not just legal change but also investment in oversight infrastructure, environmental safeguards, and community consultation to ensure that cultivation is both sustainable and culturally respectful[40].

RECOMMENDATIONS FOR INDIA

1. **Permit Regulated Hemp Cultivation:** India could expand pilot programs like the Uttarakhand hemp project[41] to Himachal Pradesh's high-altitude zones. Under Sections 10 and 14 of NDPS, the government can license cultivation of low-THC *Cannabis sativa* (hemp) for industrial and medicinal use. This would align law with geography, allowing farmers to legally grow varieties suited to cold climates. Fundamentally, any regulatory framework must be sensitive to Malana's unique socio-cultural and economic context[42]. Licensing systems should be designed to empower village cooperatives and local cultivators, rather than favoring only large corporations Standard operating procedures (SOPs) should be tailored for steep terrain as recommended by the HP committee.
2. **Protect Local Variety and Culture:** If India moves toward legal cannabis cultivation, it should consider preserving traditional Malana strains by formally allowing their continued use through a grandfathering clause. Strict enforcement of low-THC limits could unintentionally lead to the loss of ancient, culturally significant seed varieties that have been preserved for generations[43]. A more balanced policy could permit regulated possession and limited use of native charas for traditional or medicinal purposes under a licensing framework. This would be similar to Canada's model, which allows individuals to grow up to four cannabis plants per household for personal use. Such an approach could help bridge the gap between legal frameworks and cultural practices. Involving Malana's village councils in the drafting of cultivation regulations would acknowledge their traditional autonomy and reflect a consultative model similar to Canada's engagement with First Nations communities[44].
3. **Alternative Livelihoods and Development:** Government strategies must include realistic and culturally sensitive economic alternatives to cannabis cultivation. Previous attempts to promote tourism[45] or substitute cannabis with crops like legumes have largely failed due to poor alignment with local conditions[46]. In Malana, tourism has proven unsustainable, primarily because of the community's deeply rooted 'no-touch' policy and general reluctance to engage with outsiders[47]. Tourists often report being asked to leave money outside shops, underscoring the social distance maintained by villagers and the cultural norms that discourage external interaction. These factors make conventional tourism-based development unfeasible. Therefore, any transition plan must either legalize cannabis under a regulated framework or introduce alternative crops that offer comparable economic returns. Cultivation of aromatic and medicinal plants for essential oils presents a viable option, especially if implemented through existing village cooperatives in collaboration with local agricultural institutions. Furthermore, vocational training in areas such as high-altitude organic farming or eco-friendly agriculture could help diversify income[48]. The local MLA's call for alternative employment opportunities[49] must be transformed into tangible initiatives to build community trust and reduce reliance on illegal cultivation.
4. **Environmental Safeguards:** Any cannabis policy must be designed to mitigate ecological risks, particularly in fragile mountain ecosystems like Malana. This includes implementing zoning regulations that prohibit cultivation on steep slopes or within protected forest areas, and mandating soil conservation techniques such as terracing and mulching. Sustainable irrigation should rely on gravity-fed channels rather than electric pumps that draw directly from headwaters, in order to preserve the regional water balance. India can take cues from international regulatory models. For example, California mandates water permits for cannabis cultivation[50]. Similarly, India could require farmers to register cultivation sites and comply with water-use guidelines tailored to local environmental conditions. Effective monitoring by environmental authorities, potentially supported by satellite imagery, could help detect illegal clearings or instances of non-compliance. Equally important, villagers should receive training in sustainable agricultural methods, including organic pest management and erosion control, as a foundational part of any legalization or licensing framework[51].
5. **Strengthen Legal Enforcement and Health Education:** For the unregulated cannabis sector, India requires an enforcement strategy that is both effective and humane. Current eradication efforts are expensive and typically eliminate only a small portion of cultivation, as reported . A more sustainable approach would involve harm-reduction strategies, such as offering counseling services and introducing regulated buy-back programs to minimize economic loss for farmers. Public health education should also be prioritized. Drawing from Canada's example, where a $46 million campaign was launched to raise awareness about the risks of heavy cannabis use[52], India could implement similar programs targeting youth. These initiatives should aim to

prevent addiction while respecting the autonomy of adult users. Simultaneously, resources must be enhanced for narcotics enforcement units, with specialized training for operations in mountainous regions, to curb illicit trade without resorting to excessive force or violence[53].

6. **Research and Data Collection:** Finally, India should prioritize research on Himalayan cannabis cultivation to inform evidence-based policymaking. This includes conducting agronomic studies on high-altitude hemp varieties, socio-economic assessments of households in Malana, and environmental impact evaluations. If a pilot cultivation program is introduced, its data and findings should be made publicly accessible to support transparency and continuous policy refinement. Collaborations with academic institutions such as CSK Himachal Pradesh Agricultural University and civil society organizations like Avani, which specializes in Himalayan fiber crafts, can ensure a multidisciplinary and locally grounded approach[54]. Such research will address current knowledge gaps and contribute to the development of sustainable, culturally appropriate cannabis policies.

CONCLUSION

Cannabis farming in Malana sits at a crossroads of tradition and prohibition. Our socio-legal examination shows that Malana's culture and geography have fostered a unique cannabis heritage, which national law currently undermines. The clash creates social discontent and drives environmentally harmful practices in the Himalayan ecosystem. Conversely, Canada's model illustrates an alternative paradigm; by legalizing and tightly regulating cannabis, the state can bring cultivation into the open economy, reduce criminal penalties, and implement safety measures.

India's journey may eventually follow suit at least partially. Recent policy shifts like state hemp rules and medical cannabis pilot programs suggest an opening, yet Malana's case reveals unresolved tensions. Future legislation must carefully balance Malana's communal autonomy and ecological fragility. This study highlights the need for integrated policies: allowing controlled cannabis cultivation could support Malana's livelihood while reducing illicit activity, but only with strong environmental controls and respect for local norms. Key gaps remain in understanding the long-term socio-economic and ecological impacts of such changes.

Ultimately, reconciling Malana's cannabis tradition with law will require nuanced governance that synthesizes lessons from international examples with grassroots realities. As cannabis norms evolve globally, comparative analyses like this one can guide India toward informed, culturally sensitive, and ecologically responsible policies.

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