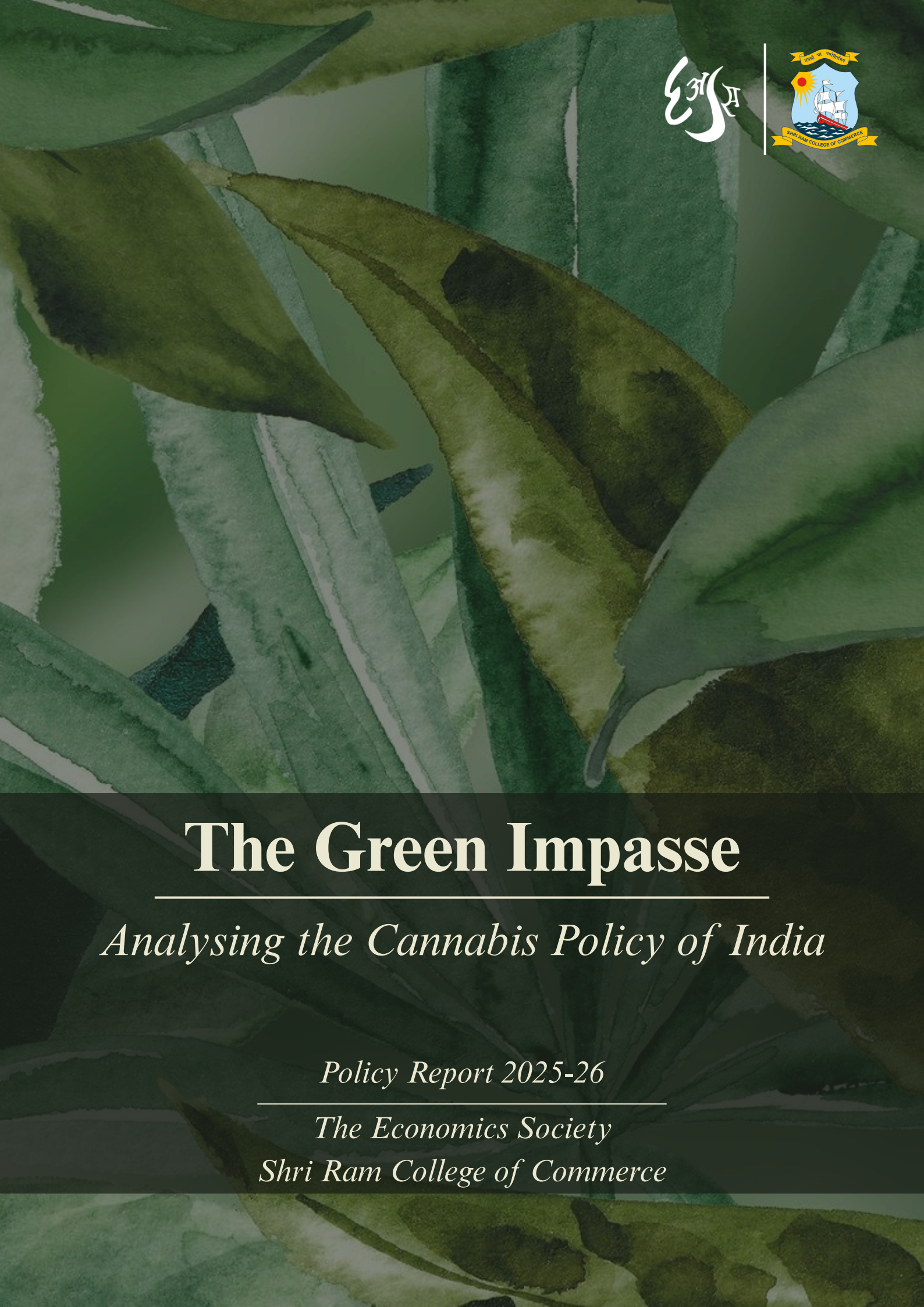

The Green Impasse

Analysing the Cannabis Policy of India

Policy Report 2025-26

The Economics Society
Shri Ram College of Commerce

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EXECUTIVE SUMMARY

This policy report looks into the complex landscape of cannabis governance in India. For a long time, cannabis was linked to rituals, festivals, and rural economies throughout the subcontinent. It thrived as a resource for fibres, seeds, and traditional medicines. However, legal changes after colonial rule, along with international pressure in the 20th century, led to strict restrictions that criminalised most uses of the plant. This approach ignored its non-intoxicating parts and industrial potential. As a result, debates have emerged about its effectiveness, fairness, and the opportunities that have been lost, as underground markets continue to flourish despite tough laws.

At its core, this analysis reveals a policy contradiction: prohibitions meant to protect public health have led to continued underground use. This has disproportionately impacted marginalised communities while hindering legal businesses. Health issues, including cognitive impairment, dependency risks, and broader societal pressures on mental health and emergency services, must be balanced against cannabis's ability to promote sustainable agriculture, increase rural incomes, & replace resource-heavy crops. Areas where the plant naturally grows could benefit from eco-friendly farming, bio-composites & nutraceuticals, generating significant income from exports & domestic innovation. Using careful historical review, legislative analysis, economic forecasts, & comparisons across jurisdictions, this report examines these challenges. It traces the history of regulations, assesses tax & environmental trade-offs, and looks at innovative experiments in progressive states. International examples, from decriminalisation models to mixed licensing systems, offer frameworks for thoughtful reform. The findings suggest a need for a shift in approach and to create tailored policies that distinguish among recreational, therapeutic, and commercial uses. Proposed reforms include zoning cultivation permits, incentives for processing, oversight boards involving public & private sectors, and harm-reduction strategies. By including the voices of farmers, economists, and ethicists, India can reshape its cannabis policy, linking economic growth with ethics.

INTRODUCTION

Drug abuse has been one of the most fabled issues of the modern era, attracting large resources and funds to find its solution. However, one drug which has been consumed for its narcotic effects for ages, one whose reputation and pervasiveness have ebbed and flowed over the centuries, is cannabis. The cannabis plant is a flowering plant whose different parts, like the leaves, buds and resin extracts, contain narcotic compounds which, when consumed, cause effects of intoxication.

Over the years, with changing kingdoms, rulers and governments, the legal position of this plant in the Indian subcontinent has changed drastically; and with the changing legal position, the social and cultural ties which India has held with this plant have also been affected. Cannabis is a plant that can grow wild in diverse climatic conditions. In India, it is found in abundance in states such as Uttarakhand, Himachal Pradesh, Odisha, Uttar Pradesh and several other states. After the Narcotics and Psychotropic Substances Act of 1985, all forms of cannabis preparations and their production, cultivation, and consumption, except for certain cannabis leaf drinks and uses for industrial, medicinal and research purposes were prohibited in India. The punishments for the consumption, possession and sale of cannabis have been said to be “too harsh” by many critics of the law. Apart from jail and fines, the maximum punishment under this law is the death penalty. The current legislation does not convict people based on the type of drug but rather based on the quantities found. This clause ignores the cultural, economic and religious essence connected with cannabis. Thus, one could argue that the current legislation has not only failed in controlling drug abuse, but has also been unable to consider the multifaceted ties that cannabis has with our nation, which has further led to problems like over-criminalisation and added burden to the current prison system. Despite the mentioned significance, it is also a fact that cannabis consumption may lead to problems with memory, judgment, paranoia and continued consumption may lead to addiction concerns and the Cannabis Use Disorder. Thus, a legislation that balances the ill effects of cannabis with its importance and benefits to India is a critical requirement.

PURPOSE OF WRITING

An important point of discussion in the larger debate of drug control and healthcare has been that of cannabis. The plant was historically valued for its cultural and religious significance in India but was later classified as a controlled substance under modern law. This report discusses the background, laws, risks, and impact on the economy that different models of cannabis policy impose. The detailed understanding of these topics would then further form the base for the subsequent recommendations to the existing policy framework. Cannabis is a plant species, the different parts of which have been commonly consumed for their narcotic purposes. Apart from this, the cannabis plant also has widespread uses in textiles, food, construction, and a multitude of other industries. Consumption of cannabis has been continual for most of its history; however, the period after the 1970s saw a significant decline in global cannabis production and consumption due to a shift in the global stance towards cannabis.

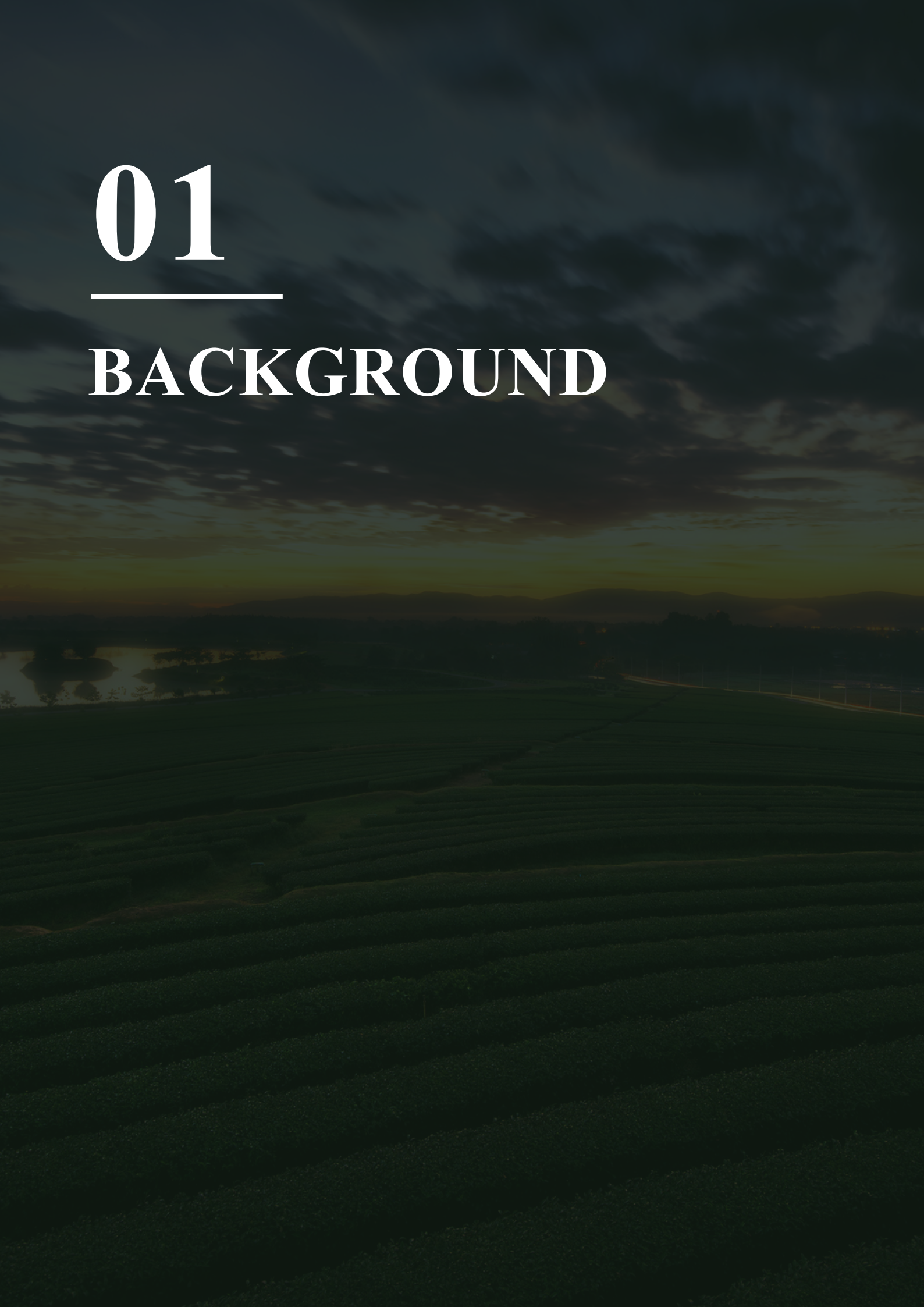
During the colonial period and even after independence, there were multiple laws aimed at controlling, restricting, or regulating cannabis use in India. This report aims to critically analyse these laws, especially the Narcotic Drugs and Psychotropic Substances Act, 1985, which governs the production, consumption, possession, and all other activities associated with narcotic substances. This law has drawn great criticism, especially the sections regarding cannabis, which has been studied at length in this report. The economic and industrial potential of cannabis as a commercial crop is commendable. Its properties, which allow it to be used to produce textiles, give it great potential to be used as a replacement for cotton. Apart from textiles, cannabis has several other applications in varied industries. The report covers the different policy models adopted in different nations, and the case studies provided by different Indian states provide a deeper understanding of the actions to be adopted towards cannabis. Finally, by doing an in-depth analysis of all mentioned aspects, the report formulates enforceable policy recommendations to ensure an equally favourable outcome for all stakeholders, minimising existing drawbacks and opening up new ways to harness the potential of cannabis.

METHODOLOGY

This policy report spans all aspects related to cannabis and the related policy framework. It starts with a basic overview of cannabis, exploring its significance, meaning, types, and composition. The report then covers the immense historical presence of the cannabis plant, especially in Indian culture and religion. This involves a detailed analysis of existing secondary sources and archives, with knowledge of the widespread presence of cannabis in a cultural context. The report also conducts an in-depth study of the historical background of cannabis, providing context to the subsequent laws that came into effect, post-independence. This involved reading of Acts like the Narcotic Drugs and Psychotropic Substances Act, 1985, and the Dangerous Drugs Act, 1930, along with various criticisms provided by different authors, thus leading to a critical analysis of the impact of the policy framework on cannabis.

The subsequent sections focus on the potential of cannabis in trade and industry, taxation revenue, and overall economic well-being. Using reliable data and statistics, the potential impact of cannabis legalisation on government revenue, trade, farmer well-being, and the environment is examined. The report also covers the costs associated with such legalisation, not only in monetary terms, but also in terms of health, productivity, and crime. This analysis is based on data provided by international organisations and the government, along with strategies proposed by researchers and different administrations to mitigate such risks.

The policy models adopted in various nations are assessed and compared to identify certain features and ideas that can be adapted in India with some modifications. Case studies of Uttarakhand and Himachal Pradesh are taken to understand a shifting stance towards cannabis, especially in the Indian context. The analysis of the cannabis or hemp policy of these states is then used to derive more insights for India. Cannabis policy becomes an issue deeply rooted in religious and cultural beliefs, with several risks and benefits that need to be balanced against each other to provide the most beneficial plans of action, taking into account the needs and sentiments of all stakeholders.



01

BACKGROUND

BACKGROUND

Cannabis is a genus of flowering plant in the family Cannabaceae. It is also used as a general term for the several psychoactive preparations of the various species of the Cannabis plant. The genus Cannabis has three subspecies:

1. Cannabis sativa
2. Cannabis indica
3. Cannabis ruderalis

All species of cannabis have certain naturally occurring chemical compounds in them called cannabinoids. These chemicals are known to interact with the cannabinoid receptors, which are a part of the endocannabinoid system of our body. This system controls hunger, temperature, alertness, and immune functioning and modulates intestinal inflammation, contraction, and pain in inflammatory bowel conditions. Delta-9 Tetrahydrocannabinol (THC) is the primary psychoactive compound present in cannabis products, which is responsible for mind-altering effects. Cannabidiol (CBD) is the second most prevalent active ingredient present in cannabis, which, however, does not cause intoxication and is non addictive.

Both THC and CBD are examples of cannabinoids, which occur in varying proportions in different species of cannabis. The Cannabis sativa plant is a tall and thin plant with narrow leaves, found in warmer regions such as Southeast Asia and Central and South America. They tend to have more THC than CBD and are said to give a more energising and creative “high”; however, this is based on anecdotal evidence. The Cannabis Indica plant is a short bushy plant with broad leaves native to India, Afghanistan, Pakistan, and Turkey. The plants have adapted to the often harsh, dry, and turbulent climate of the Hindu Kush mountains. They have a higher CBD content than THC and are said to have a relaxing effect. The Cannabis ruderalis plant is an uncultivated strain native to Russia, Central Asia, and Europe. Due to low THC content and high levels of CBD, it has little use for recreational purposes; however, due to auto-flowering ability, fast maturation, and hardiness, it is of use in breeding hybrid plants. Different parts of the cannabis plant, when used for recreational purposes, are termed differently. Cannabis leaves and other crude parts are often termed as ‘Marijuana’,

CANNABIS FLOWER ANATOMY

COLA: Primary Bud
Terminal flower cluster found at end of stem

PISTILS

CALYX

FAN LEAF
For photosynthesis and is removed during trim process.

TRICHOME
Contains cannabinoids and terpenes

STEM
The stem delivers water & nutrients from the root zone to the flower buds.

The terminal flower buds found at the top of each stem are significantly more developed than those found lower on the stem.

FLOWER: Secondary Bud
Lower quality, less developed buds found lower on the stem.

On the secondary flower buds, the calyxes are underdeveloped , pistils are white and has ess trichome coverage.

whereas drug preparations of the resin secreted by the flowering tops of cultivated female plants of cannabis are called ‘Hashish’.

USAGE OF THE PLANT FOR RECREATIONAL, MEDICAL, AND INDUSTRIAL PURPOSES

Cannabis use in India takes three main forms: recreational, medicinal, and industrial. In several states, people prepare “bhang” from the leaves and consume it as a drink or sweet during festivals like Holi and Maha Shivratri. These customs have been part of community life for many generations and are seen as a normal part of celebration in those regions. In some areas, especially in rural districts and among sections of urban youth, stronger products made from the flower or resin are also used. For some people, it is connected to social gatherings; for others, it is more about stress relief. THC is the compound in the plant that causes intoxication. CBD, another component, is linked with relaxation and certain medical uses. Legally, most recreational cannabis is prohibited under the Narcotic Drugs and Psychotropic Substances Act of 1985. It restricts growing, selling, or possessing cannabis products made from the flower or resin. In a few states, the law is applied differently to leaves. Products like “bhang”, with very low THC levels, can be sold in licensed shops at specific times, during festivals. Punishments for breaking the rules vary by the amount involved and can include fines or jail terms.

In Indian medicine, cannabis, known in Ayurveda as “Vijaya”, is being re-examined for its potential therapeutic value. Interest in its medical use has grown in recent years. Current research explores how extracts of cannabinoids such as cannabidiol (CBD) and tetrahydrocannabinol (THC) interact with the body’s endocannabinoid system (ECS). Studies supported by the Ministry of AYUSH and state research centres are focusing on chronic pain management, epilepsy, anxiety, and muscular disorders that are resistant to conventional treatment (Tavhare, 2019). Firms such as the Bombay Hemp Company (BOHECO) and HempStreet make preparations that combine cannabinoids with Ayurvedic practices. The Cannabis Research Project in Jammu is working on regulated cultivation and scientific testing for medicinal purposes (Press Information Bureau, 2023). Such efforts aim to produce consistent and safe products matching modern medical standards.

Hemp is a form of cannabis with very little THC. It is grown for industrial uses and is being promoted as a sustainable crop. It can be used to make cloth, ropes, hempcrete for construction, biodegradable plastics, and health food products. Hemp seeds are rich in protein and healthy oils; the Food Safety and Standards Authority of India (FSSAI) now allows them for human consumption. Uttarakhand was the first state to give licenses for hemp cultivation. Farmers suggest that it uses less water, supports soil health, and offers an extra source of income. Trials in Himachal Pradesh, Madhya Pradesh, and Uttar Pradesh show similar results. In these states, cultivation is licensed, and THC levels are monitored by officials.

DIFFERENCE BETWEEN HEMP AND PSYCHOTROPIC CANNABIS:

Here, the differentiation between the two can be made on several bases, which are given as follows:

THC CONTENT

Hemp has a THC content of less than 0.3% by dry weight and does not cause intoxication. Thus, it can't be used for recreational purposes. High THC content in psychoactive drugs (ranging from 5% to 30%) is responsible for causing intoxication and harmful effects on both the mental and physical health of a person.

CULTIVATION AND ITS PURPOSE

Hemp is not universally banned anywhere, but governments of various countries have indeed imposed strict regulations on it, and its sole purpose of cultivation is for use in industrial processes. It is an environmentally sustainable crop and requires fewer raw materials in its cultivation. Cultivation of psychoactive cannabis is mostly banned in many countries; where it is allowed, there is a quantitative limit, and it is monitored under strict regulation. As the name suggests, such drugs have psychoactive properties and are used illegally for recreational purposes.

REGULATION

Though countries have not publicly encouraged the cultivation of hemp, many have allowed it, but with strict prohibitions. In the USA, under the 2018 farm bill, hemp was made legal, and the government monitored every step of hemp cultivation. In India, it was never legalised, but states like Uttarakhand and Uttar Pradesh have allowed it for certain projects to a limit. No country has actually publicly legalised psychoactive drugs. Cultivation and even possession of such cannabis without authorisation is a serious criminal offence and leads to long imprisonment or heavy fines. Cultivation of such specimens is allowed only for pharmaceutical purposes, and even in that case, it must meet certain

narcotics and pharmaceutical standards and cannot be just grown in their raw form.

ECONOMIC VALUE AND INDUSTRY IMPLICATIONS

Hemp is highly regarded as a raw material by the industries manufacturing bioplastics, textiles, paper, cosmetics, etc and due to its sustainable way of cultivation, it is a climate
friendly crop having no negative externalities. It can provide job and income opportunities to rural and small farmers, as its input cost is less, and it can be grown in diverse climates. Since psychoactive cannabis is a very sensitive commodity, it is only allowed for medical uses, and second, it is subject to several taxes like excise duties, sales tax, corporate tax, etc., which generate a large revenue for the state. Revenue accruing out of this industry is sourced from and channelled into regulated and legal settings. Unlike hemp, such drugs do not really assist in employment generation for farmers, especially in underdeveloped and developing economies.

SOCIAL PERCEPTION

Hemp as a drug faces comparatively less social stigma from society due to its ineffectiveness in making a person intoxicated. This is due to its low THC content, as stated above. Instead, it has been an income generator for poor farming families, and it has been growing as a utility and industrial crop since historical times. Therefore, hemp is more seen as just another agricultural crop rather than a drug.

Psychoactive cannabis, on the other hand, directly and severely affects a person's mood, actions and mental health, which has led to societal concerns regarding addiction. Social stigma in this case would be a positive discernment, as the use of such drugs should not be encouraged at all among the masses.

A BRIEF GLOBAL CONTEXT:

As we move forward, we see that in the global perspective, the perception regarding the purpose of hemp has been shifting, and gradually its significance as a major industrial raw material is being recognised. Recently, several countries have relaxed the regulations surrounding the usage of hemp in industrial activities (still with prohibitions on its content percentage). For eg: Nations like the USA and Canada, and international trade alliances like the European Union have legalised hemp for manufacturing purposes under the THC limit of 0.3%. However, India has limited the usage of hemp to select states like Madhya Pradesh, Uttar Pradesh, Uttarakhand and Himachal Pradesh.

In contrast, psychoactive drugs remain strictly regulated or even illegal in many countries due to the heavy intoxicating aftereffects leading to serious and fatal health-related problems. However, we also witness a move of relaxation from the governments of countries such as Uruguay and Germany, and also in American states like Arizona and California, regarding

medical and recreational uses.

HISTORICAL PRESENCE

There is evidence of cannabis use on the Indian subcontinent for at least 2,000 years. Classical Ayurvedic and surgical literature mention preparations derived from the plant. Ancient medical writers like Sushruta record cannabis for the relief of pain and various other medicinal uses. Colonial sources show that the plant preparations like paste or beverage, smoking tops, and hashish, were widely used for ritual, medical and recreational purposes across classes and geographies. In the law, India's handling of cannabis changed in the late 20th century. Until the mid-1980s, some traditional uses (most importantly, cannabis beverages) were socially accepted and available commercially in much of the country. The Narcotic Drugs and Psychotropic Substances Act of 1985 placed cannabis under heavy federal control, primarily to satisfy international obligations and mounting world pressure to enhance control over drugs. The Act strictly prohibits and regulates Hashish and dried flowering tops of the cannabis plant, and Cannabis drink or paste has a more dubious legal status since it is de facto exempted from some of the definitions in the NDPS, permitting cultural use like during Holi in some states to prevail. The legal shift of the 1980s thus brought to an end the earlier, pluralist practice regime and commenced a centrally enforced prohibitory regime in India.

CONTEMPORARY DEBATES:

- **PUBLIC HEALTH AND MEDICAL EVIDENCE**

In 2020, the United Nations Commission on Narcotic Drugs and the World Health Organisation rethought cannabis. For the very first time in history, they officially recognised that the plant has medical potential, especially for pain relief and certain therapies. This decision didn't legalise cannabis extensively, but it encouraged nations to explore further study and how it might be used safely in medicine. Many health workers and campaigners were welcoming of this, saying that the prohibition of cannabis no longer makes sense because it can benefit patients. Meanwhile, public health experts warn that the data remain mixed; cannabis is beneficial in some cases but harmful to others. Thus, they advocate strict control, proper dosage information, and public education instead of complete freedom. In India, scientific research on cannabis medicine remains in its infancy. A few research organisations and start-ups have been exploring the possibilities of using cannabis extracts in Ayurveda as well as allopathic medicine. But the majority of experts opine that India has to first develop scientific evidence and undertake controlled clinical trials before there can be large-scale legalisation.

- **FARMERS AND INDUSTRIAL HEMP**

In India's hill states of Uttarakhand and Himachal Pradesh, farmers have shown more and more interest in cultivating hemp - a type of cannabis plant that does not make people intoxicated but is perfect for yielding fibres, oils, and eco-friendly products. Hemp can be a boon to local farmers as it grows in mountainous land, needs little water, and can be cultivated in order to produce clothing, ropes, paper, building material, and even health supplements. To small farmers, the crop would mean extra income and livelihood sources. But there's another side to the story. The critics fear that the cultivation of hemp may allow for easier export of illicit cannabis to markets unless regulated. Others worry that it might be dominated by big corporations at the expense of small farmers. To balance such disadvantages and advantages, the Himachal Pradesh government authorised a pilot project in 2025 to try cultivating cannabis strictly under regulation for medicinal and industrial purposes only (NDTV). This move signals that Indian states are not afraid to experiment andfind out before implementing major policy changes.

- **CRIMINAL JUSTICE AND SOCIAL IMPACT**

The NDPS Act, 1985, penalises cannabis as a serious offence with harsh penalties for possession, sale, or cultivation. Critics argue that it puts small users in jail while large dealers are acquitted and disproportionately punishes poor and marginalised sections. Decriminalisation of small personal use and shifting towards rehabilitation and public health is recommended by most experts.

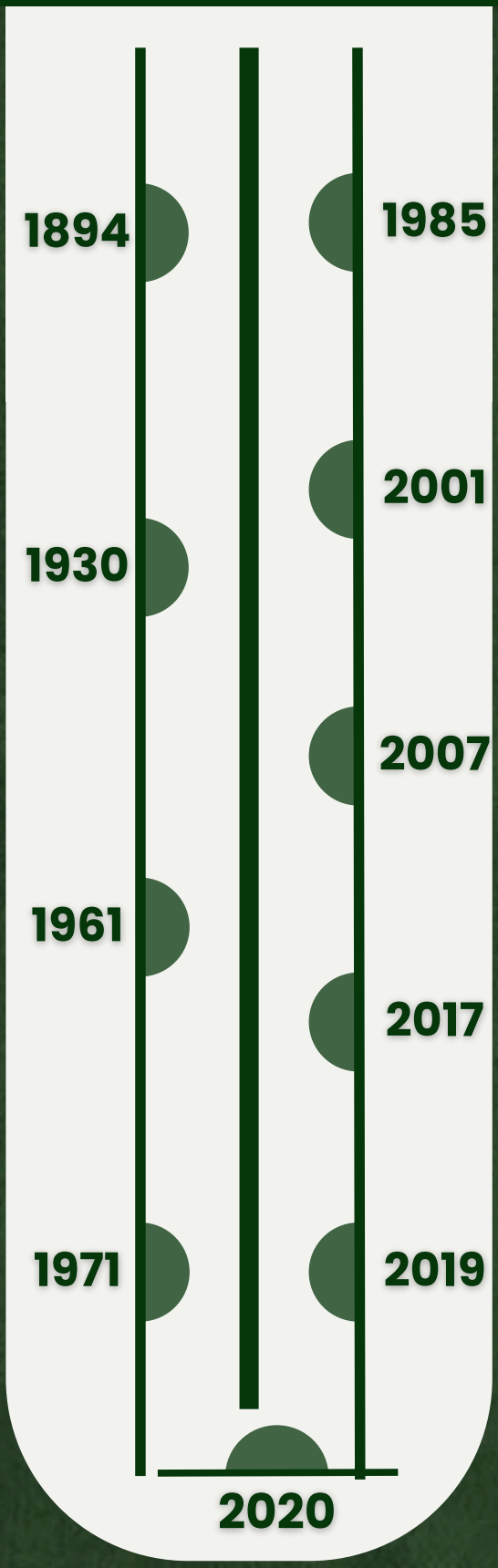
- **REGULATORY FIT AND INTERNATIONAL NORMS**

Internationally, the WHO and the UN have relaxed cannabis control, promoting medical and industrial research. India needs to balance international norms, the NDPS Act, and state experiments such as Himachal's pilot project.

02

HISTORICAL CONTEXT

CANNABIS REGULATION TIMELINE



Indian Hemp Drugs Commission *rejects total prohibition; distinguishes oral use from smoked and resin forms.*

Dangerous Drugs Act 1930 *introduces first consolidated narcotics law; brings resin and herbal cannabis under regulation.*

UN Single Convention 1961: *India signs; resin and herbal cannabis scheduled; oral preparations exempted through Indian lobbying.*

THC was internationally scheduled under the ***UN Psychotropic Substances Convention.***

NDPS Act *criminalised resin and herbal cannabis while exempting oral preparations.*

NDPS Amendment ***i****ntroduced quantity-based sentencing for possession offences.*

Uttarakhand *became the first Indian state to issue* ***industrial hemp cultivation licences.***

Manipur and Himachal Pradesh *launched* ***controlled hemp farming pilots*** *for fibre and paper.*

AYUSH Ministry formally recognised *cannabis as a valid ingredient in Ayurvedic formulations.*

UN *voted to remove cannabis from* ***Schedule IV*** *and India chose to abstain.*

HISTORICAL CONTEXT

PRE-COLONIAL AND COLONIAL REGULATIONS

perception regarding cannabis; instead, it was a customary product used in religious and regional practices, with no reason to ban it. While its use was advised to be limited to spiritual and therapeutic use, it was never criminalised. Also, there was no formal law that regulated the cannabis production and usage in India before the arrival of colonialists; the legal framework was of a pluralistic nature that varied according to customs and perceptions of different religions and beliefs. The perception of hemp was never that of an "outlawed plant"; in turn, it was a socially sanctioned and medically documented drug.

DYNASTIC PRUDENCE

Long before British rule, India was ruled by several dynasties for thousands of years; however, the prominent ones recognised in India's history are the Mauryan Empire, the Gupta dynasty, and the Mughals. When we discuss the Mauryan Empire, its administrative system, its laws were derived from the 'Arthashastra' framework by Chanakya, which focused on commerce, trade, and morality. According to the then legal framework, under the Mauryan rule, cannabis was a normal agricultural commodity, though accompanied by minor regulations. Hemp was a drug in the industries and widely used for making ropes, bowstrings, coarse textiles, etc. Hemp was part of the state-controlled agricultural economy, but there was no penal law surrounding it.

In the Gupta dynasty, the freedom with the people on the use of various cannabis was the most, and such plants even came under one of the five sacred plants according to 'Sushruta Samhita', the magnum opus in the field of medicine written by the Father of Surgery, Sushruta. Apart from its medicinal uses, cannabis was widely used for recreational purposes; known as rasayana (rejuvenating substance) in the then era, it was used for inducing sleep, providing pleasure and stimulating appetite. Utilisation of hemp in various industries was also extended and made broader; hemp was a very common and significant raw material in textile and maritime industries, and hemp ropes were vital for shipbuilding

and irrigation machinery, and the hemp oil extracted was vital for lighting lamps and medicinal ointments.

The Mughal dynasty was the most recent and the largest empire (after the Mauryans) to have ruled India. Its rules and regulations were largely derived from the Islamic or Sharia law. According to the Sharia law, alcohol consumption is sinful, hence it was banned under the Mughal rule; however, cannabis was considered less sinful as it was not formed through the process of fermentation and was not restricted under the rule. The Mughal emperors recognised the importance of cannabis in terms of trade and commerce, along with its medicinal benefits; we get to know from the records of 'Ain-i-Akbari' that prominent ancient historian Abul Fazl mentions that cannabis-based drinks like 'bhang' were accepted and served in the royal court. Though cannabis was, and is, not a common commodity in Islamic customs and traditions, the Mughal emperors allowed its usage and public consumption during Hindu festivals like Holi and Maha Shivratri. At the same time, Mughals were also aware of the negative consequences of excessive use of such drugs, which is why freedom was not as free as it was under the Mauryan and the Gupta rule. Its sale was taxed where the local governors collected excise taxes from cannabis sellers and 'bhang' shops, making it not as cheap and common a consumable as in other regimes. Hemp again was state-supported and important for commercial uses for manufacturing paper, military gear, ropes, etc.

THE BRITISH COLONIAL PERIOD

The arrival of British rule marked a shift in the system which governed the cultivation, sale and use of cannabis. Again, the use of such drugs was not criminalised, but a more formal structure was given to everything related to the drugs. Rather than just being a normal agricultural commodity, hemp and other cannabis became a regulated and taxed item. Less significant plants, such as 'bhang', were treated merely with excise duties; however, plants and drugs that were well known in the global market were strictly sanctioned, and a state monopoly was established. The case of opium is one of the most infamous trade lore of the British Empire. The Britishers imposed a total government monopoly on the trade and cultivation of opium. Chinese silk, tea and porcelain had a very high demand in Britain, and bulk quantities of these were imported from China; however, China did not require any of the goods the Britishers offered, leading to a very high negative balance of trade for Britain. Then, the Englishmen discovered that Chinese merchants highly desired Indian opium despite it being banned by the state. Britishers with total control over the cultivation of poppy flowers (raw form of opium), took full control over it and sold the whole of the final output to

the Chinese illegally and earned silver, then that silver was used to buy Chinese products. This one prominent example is a poster child of the British legal framework regarding cannabis. The regulations were merely meant to accrue all the economic benefits that came from the trade of such commodities and using them for their own prosperity. In the following, we are going to discuss the important moves taken by the British government relating to sanctioning cannabis.

THE INDIAN HEMP DRUGS COMMISSION REPORT (1893-94)

Issued around the time of 1893, this is a 7 Volume comprehensive report.

VOLUME I

The first volume is the background of cannabis use in India, starting from the Vedic times to the present situation of the British Raj. It outlines different forms of hemp into 'Cannabis leaves', which is mostly used in drinks, 'Marijuana', whose dried leaves are smoked and 'Cannabis resin', also the strongest form. The report also illustrates the importance of the usage of such plants in Hindu traditions and festivals.

VOLUME II

This volume focuses on economic and administrative aspects. It explains where such plants are mainly cultivated and analyses their revenue patterns. For instance,

- Marijuana- Bengal, Madras and Bombay presidencies
- Bhang (Cannabis leaves): A wild plant, almost everywhere
- Hashish: Punjab, Kashmir and North-West Frontier

VOLUME III

The third volume outlines the consumption pattern and the social context; basically, who consumed cannabis, how and why. The report was able to mention this after a large-scale survey of villages, towns, prisons and asylums. It was found that it was mainly consumed by labourers, ascetics and soldiers as it gave a very enriching feeling of relief and pleasure. Alongside, it also mentions the seasonal usages that are done with religious intent during festivals and large family gatherings.

VOLUME IV

After discussions with over 100 medical professionals, the fourth volume highlights the psychological and physiological effects. It was found that excessive use of the drug is highly harmful; however, with proper regulation and awareness, moderate use causes no harm. And the people living in

asylums, little to no link was found between usage of hemp and insanity, as most of them were admitted due to other factors such as alcohol, poverty, etc.

VOLUME V

After a brief analysis of Volume I and III, the fifth volume explains the effects of the prohibition of cannabis. For example, 'Bhang' is widely used in Hindu religious practices, as offerings to Lord Shiva and in ascetic practices as well. An outright ban on 'bhang' and related drugs would make the government face severe backlash from the community and could lead to social unrest.

VOLUME VI

This volume entirely focuses on existing British policies and those that could be reformed. It first examined the existing laws and excise systems and suggested the following:

- Regulation, not prohibition
- Maintain a licensing system for cultivation and sale
- Keep taxes high to limit the excessive use, but not so high as to encourage smuggling
- Continue monitoring medical and asylum data

VOLUME VII

Volume 7 is about the final summary and policy recommendations. And the following were key takeaways:

- Cannabis is neither a societal nor medical threat; regulation is sufficient, as moderate use of such drugs means no harm.
- Recommended no prohibition on cultivation, trade and consumption
- Suggested appropriate education to spread awareness regarding its negative effects when excessively consumed.
- Urged the government to avoid moral judgment and analysis of the drug situation of India through a Western lens.

DANGEROUS DRUGS ACT OF 1930

The Dangerous Drugs Act from the British colonial era was enacted with the intention of consolidating and controlling narcotic drugs like cannabis, opium, and coca across British India. It placed strict licensing requirements on the cultivation, manufacture, possession, and commerce of these drugs without enacting a complete prohibition on cannabis usage. The Act made differential treatment with respect to different parts of the cannabis plant, subjecting resin and flowering tops to greater controls due to acknowledged increased potency, while permitting regulated usage of the leaves. Enforcement was largely left with provincial excise authorities, who tried to manage both revenue-raising and acceptability of cannabis usage within society in view of its religious usage as well as its medicinal

properties. The Act's main focus was on administrative controls as well as excise taxation with penalties for unauthorised usage as well as trafficking thereof, though it did not criminalise possession by consumers.

THE DRUGS AND COSMETICS ACT, ENACTED IN 1940

Together with the Dangerous Drugs Act of 1930, the Drugs and Cosmetics Act of 1940 enacted controls regarding medicinal agents that involved cannabis derivatives. It placed tight restrictions on cannabis tincture and extract manufacture, distribution, and sales with medical prescription requirements and a guarantee of health security, thus providing a scientific framework of administration that was independent of the Dangerous Drugs Act's fiscal and criminal controls (Central Drugs Standard Control Organisation, 1940). The twin legislative framework was a testament to cannabis's simultaneous classification as both a medicinal asset and a regulated substance.

POST-INDEPENDENCE POLICIES (1947-1985)

India's cannabis policy from 1947 to 1985 experienced a significant shift from a colonial regulatory framework that was meant to control its cultivation and trade with a view to mainly generating revenues to a centralised, strict criminal regime that was compatible with international control conventions on drugs. This shift was brought in through a series of legislative enactments, as well as international treaties, thus creating a precedent for the country's current drug law regime.

When India gained independence in 1947, it continued to enforce and modify its inherited colonial legislation. The control of cannabis was marked by decentralisation since its central government devolved much of its licensing power and enforcement to the provinces, which created significant differences within Indian provinces. Article 47 of the Indian Constitution advised that the state strive to forbid intoxicants injurious to health; nevertheless, it was non-enforceable and largely operated as a moral stimulus that informally shaped social as well as political perceptions of drug control. In the 1950s, the Prohibition Enquiry Committee, as well as several national narcotics meetings, acknowledged the deep cultural entrenchment of cannabis usage but pushed for a phased reduction of non-medical usage rather than immediate prohibition, thus encouraging a regulatory approach of controlled tolerance. Consequently, during this period, cannabis use remained predominantly regulated but not criminalised under excise laws.

THE UNITED NATIONS SINGLE CONVENTION ON NARCOTIC DRUGS, 1961

A dramatic shift in India's cannabis policy came when it ratified the United Nations Single Convention on Narcotic Drugs in

1961. This treaty moved to create a unified international system for eliminating non-medical use of narcotics within a time-limited framework. India negotiated a 25-year exemption to allow continued traditional cannabis leaf-based preparation usage, which was different from internationally banned resin and flowering tops (United Nations, 1961). Subsequently, India updated its own domestic law to conform with these treaty obligations, significantly strengthening controls on the cultivation, exportation, and trafficking. The 1960s and 1970s also saw a step-wise centralisation of enforcement power, taking jurisdiction from state excise authorities to centralised ministries, mirroring international patterns of greater anti-drug enforcement during the era of global "war on drugs" initiatives. This shift moved Indian drug policy from emphasis on revenue raising to that of criminalisation with expanded penal measures to support prohibitions.

Despite these revisions, India's narcotics statutes still demonstrated fragmentation and ineffectiveness in responding to emergent challenges of abuse and trafficking. The 1977 Central Prohibition Committee was a parliamentary commission appointed to consider drug abuse, including cannabis, and give recommendations on policies to be undertaken. It concluded that most people did not abuse drugs, but a significant number did so with poor facilities for treating addiction. The committee made recommendations to support prohibition policies, expand rehabilitation efforts, and better coordinate enforcement with health services (Ministry of Home Affairs, 1977). These flaws highlighted the need for revisions in the existing colonial laws and necessitated an integrated and strict legislation that criminalised all acts involved in the narcotic trade, starting from cultivation and trafficking to possession and consumption. This led to the signing of the Narcotic Drugs and Psychotropic Substances Act (NDPS Act) of 1985. Despite the harsh sanctions, which included mandatory minimum terms, non-bailable offences, and proof of demand on the part of the accused(Parliament of India, 1985), the Act made a provision to exempt traditional leaf-based cannabis preparations from such strict excise control. Furthermore, the Narcotics Control Bureau, the institution for centralised enforcement and international cooperation for matters related to drug control, was established in 1986 as a direct result of this Act. This Act marked a critical shift from a colonial revenue-based and fragmented regulatory framework to a single, complete criminal jurisprudence that focuses on prohibition with strict enforcement.

EVOLUTION OF SOCIAL ATTITUDES AND STIGMA

The societal perception of cannabis had changed considerably over time. Cannabis

leaf preparations were often used to make beverages, which were an essential part of cultural practices. Often used during holidays like Holi and Maha Shivaratri, it was a commonly found and consumed herb. This view started to change throughout the British colonial era. British doctors and administrators started researching cannabis use and its effects, connecting it to illnesses and social problems. The Indian Hemp Drugs Commission Report(1893-94) was one of the key reports under colonial rule, which established a link between excessive cannabis consumption to development of illness. Under colonial rule, the societal perception of cannabis shifted from a traditional herb to a risky, harmful and immoral substance. Under international pressure and evolving drug policies, India's stance further evolved after gaining independence. The Narcotic Drugs and Psychotropic Substances (NDPS) Act, 1985, made the consumption of cannabis resin and flowers illegal, although cannabis drink remained legal in some states. Such a legal distinction was a cultural compromise, but it also increased social stigma. Users of cannabis began to be viewed as criminals or addicts rather than as individuals exercising a private choice. The society’s views on cannabis have again taken a turnabout in the modern era. With therapeutic and medical uses of cannabis increasingly coming into the limelight, there has been an evolving international attitude and greater discourse in the public. Many have called for a scientific and neutral evaluation of cannabis and for altering existing policies.

03

LEGAL AND REGULATORY LANDSCAPE

LEGAL AND REGUATORY LANDSCAPE

NATIONAL LEGISLATION: NDPS ACT 1985, OBJECTIVES, IMPACT AND FAILURES:

The National Drugs and Psychotropic Substances Act of 1985 is a special Act aimed at consolidating and amending the law relating to narcotic drugs, to make stringent provisions for the control and regulation of operations relating to narcotic drugs and psychotropic substances. It is the foundational element to India's approach to narcotic drugs and was a direct result of the signing of 3 important international conventions, which include:

SINGLE CONVENTION ON NARCOTIC DRUGS, 1961:

This was the first convention passed by the United Nations on narcotics and now forms the foundational stone to the international policy on drugs. After the dissolution of the League of Nations in 1946, this convention was passed to replace the earlier conventions, which were the International Convention relating to Dangerous Drugs, in 1925, and the Convention for the Suppression of the Illicit Traffic in Dangerous Drugs, in 1936. Over 100 illicit substances were listed in the four schedules of this convention, which included drugs like heroin, opium, cannabis and coca. The convention restricts the production, manufacture, cultivation, sale and transport of the listed substances for medical and scientific purposes only. Schedules I-III cover the most regulated and dangerous drugs and their derivatives, to the lesser regulated and dangerous ones, whereas Schedule IV covers all substances, including some from Schedule I, which are to be used in specified quantities for scientific and medicinal use only, if any alternative to these is available. This convention also introduced licensing for the export and import of any narcotic drugs and mandated nations to have a competent authority to permit such licenses.

CONVENTION ON PSYCHOTROPIC SUBSTANCES, 1971:

This convention added psychotropic substances under the purview of international law under its four schedules. While scientifically, drugs refer to both narcotics- i.e., substances which induce stupor or pain relief- and psychotropic substances which have mind-altering effects

effects, in the given context, drugs refer to the substances listed in Schedules I and II of the Single Convention on Narcotic Drugs, 1961, and psychotropic substances refer to the substances listed in the four schedules of the Convention on Psychotropic Substances. This convention also introduced licensing for the listed substances and directed their use to medicinal, scientific and industrial purposes only.

UNITED NATIONS CONVENTION AGAINST ILLICIT TRAFFICKING IN NARCOTIC DRUGS AND PSYCHOTROPIC SUBSTANCES, 1988:

This convention expanded the regulation to "precursor chemicals",i.e., chemicals that were required to manufacture narcotic drugs and psychotropic substances. It necessitated the notification of production, sale and trade of any such precursor chemicals to competent authorities, along with monitoring such activities and seizing these chemicals if they are found to be used for drug manufacturing. Apart from precursor chemicals, the convention expanded its regulation to the demand side of the drug problem. The previous two conventions focused on placing restrictions on the supply of drugs; however, the 1988 convention also mandated the possession of narcotic drugs and psychotropic substances to be a criminal offence, even if for personal consumption. This represented a more prohibitive stance adopted by the UN to tackle the growing problem of drug trafficking.

EVALUATION AND PROGRESS OF INTERNATIONAL DRUG CONVENTIONS:

The success of the conventions can be expressed in terms of their reach and universality. The 1961 convention, the 1971 convention and the 1988 convention have 186, 184 and 191 signatories respectively. This clearly represents the "near-universality" of the UN drug conventions.

Another aspect to judge the success of these conventions would be the trends in drug consumption and drug trafficking. On this basis, it would largely be considered a failure as nations relax laws on certain drugs like cannabis, the promotion of "risk-reducing" strategies that aim at reducing overdose deaths and disease transmission and diversification of drugs under abuse with the emergence of newer forms of narcotic drugs all go against the prohibitory goals and objectives set by these conventions. Illegal use of narcotics and drug trafficking continue to remain rampant as almost all banned drugs continue to be available in the illegal markets at very accessible prices. While the ban of opium production in Afghanistan by the Taliban had a very drastic impact on opium supply worldwide, supply of other forms of drugs, including methamphetamine, ketamine, cocaine and cannabis, has only increased. Even the

reduction in opium supply was very recent, and it is only an immediate effect of the ban imposed by the Taliban.

Over the past six decades, there has been a rising trend in opium supply and production The agenda of controlling precursor chemicals was also hard to accomplish. This is because these chemicals have widespread uses in many industries such as textile, medical and paint industries. Countries do not have established control systems, and existing bodies often focus more on the actual drugs, relegating the precursor chemicals to secondary importance. An analysis of the amount of precursor chemicals seized and the amount of drugs produced clearly shows that traffickers manage to get the required substances easily. Furthermore, the use of alternative precursors Apart from these international obligations, the rising illicit trade of drugs, the impact on the youth and the workforce and the economic implications due to money laundering necessitated a comprehensive policy framework to regulate the production, consumption and trade of psychoactive substances.

Article 47 of the Indian Constitution, which directs the state to work towards improving public health, raising nutritional standards, and enhancing the overall standard of living and then further directs the State to take measures to prohibit the consumption of intoxicating drinks and harmful drugs, except when required for medicinal purposes, is considered as the guiding principle of the NDPS Act.

KEY ASPECTS

- **DEFINITIONS:**

This Act covers definitions of various drugs, psychotropic substances and other related terminology. The following is the definition of cannabis as per the Act:
"cannabis (hemp)" means:
"(a) charas, that is, the separated resin, in whatever form, whether crude or purified, obtained from the cannabis plant and also includes concentrated preparation and resin known as hashish oil or liquid hashish;

(b) ganja, that is, the flowering or fruiting tops of the cannabis plant (excluding the seeds and leaves when not accompanied by the tops), by whatever name they may be

known or designated; and

(c) any mixture, with or without any neutral material, of any of the above forms of cannabis or any drink prepared therefrom." (The Government of India, 1985). Here, the cannabis plant refers to any plant from the genus cannabis.

- **OFFENCES AND PENALTIES:**

Sections 15-40 of this Act cover the various penalties for the consumption, production, sale, transport, cultivation, use, export and import of drugs and psychotropic substances.
The following are some sections covered in detail, as mentioned in the Act governing the punishments for possessing and consuming drugs.

1) Section 15-23 covers three levels of punishment depending on the quantity and type of drugs found in possession. The punishment varies for small (1 kg or less for marijuana and 100 grams or less for hashish, commercial (20 kg or more for marijuana and 1 kg or more for hashish) and immediate quantity, i.e. quantity more than small and lesser than commercial quantity.

For small quantities, the punishment involves a rigorous imprisonment of 6 months or a fine extending to Rs. 10,000 or both.

For quantities lesser than commercial and more than small, the punishment involves rigorous imprisonment, which may extend to 10 years and a fine extending to Rs 100000

For commercial quantities, the punishment involves rigorous imprisonment of not less than 10 years and extending to 20 years and a fine of Rs 1,00,000, which may extend to Rs 2,00,000.

Section 27 of this Act refers to the punishment for the consumption of narcotic drugs and psychotropic substances.

"Whoever consumes any narcotic drug or psychotropic substance shall be punishable,
(a) where the narcotic drug or psychotropic substance consumed is cocaine, morphine, diacetylmorphine or any other narcotic drug or any psychotropic substance as may be specified in this behalf by the Central Government by notification in the Official Gazette, with rigorous imprisonment for a term which may extend to one year, or with fine which may extend to twenty thousand rupees; or with both; and
(b) where the narcotic drug or psychotropic substance consumed is other than those specified in or under clause (a), with imprisonment for a term which may extend to six months, or with a fine which may extend to ten thousand rupees, or with both." (The Government of India, n.d.).

Under section 31A of NDPS Act any individual who has committed a second or subsequent offence related to "engaging in the production, manufacture, possession, transportation, import into India, export from India or transhipment, of the narcotic drugs or psychotropic substances" (The Government of India, 1985) shall be punished with either life imprisonment (or imprisonment of 10 to 20 years) or the death penalty. This section of enhanced punishment is applicable only if the person is found to be dealing in a commercial quantity of the illicit drug (20kg or more for hashish).

- **ESTABLISHMENT OF STATUTORY AUTHORITIES:**

The NDPS Act led to the formation of many statutory authorities, which are:

- The Narcotics Control Bureau was established in March 1986 as per Section 4(3) of the NDPS Act.
- The Narcotics Commissioner was appointed to head the Central Bureau of Narcotics as per Section 5.
- The Central Bureau of Narcotics had already existed, but Section 5 of the NDPS Act formalised its role.
- The National Fund for Control of Drug Abuse was established to secure funds to combat drug abuse and drug trafficking. Several sections of the Act allow for the appointment of officers to exercise various powers to enforce the law under this Act.

- **LICENSING AND REGULATION:**

The Sections of this Act also provide for licenses and permissions for production, manufacture, transport, sale and use of the regulated substances only for scientific, medicinal and industrial purposes. For example, Sections 10 and 14 of this Act allow for the cultivation of cannabis plants for industrial purposes or for scientific or medicinal research at the discretion of the State Government.

- **IMPACT:**

- The NDPS Act allows the addition of newer forms of narcotics to its present list with relative ease. Any new additions or removals from the current list of regulated drugs can be done by simply announcing them in the official gazette without any formal legislation or amendments to the law.
- The Narcotics Control Bureau, which is the primary body established to combat drug trafficking, acts as a hub for acquiring and disseminating relevant information while maintaining intergovernmental relationships.
- The authorities granted to the magistrates and other government empowered state and central officials to issue search and arrest orders allow for a timely reaction to information, eliminating the need to issue warrants for arrests.

STATE LEVEL RULES AND VARIATIONS:

The NDPS Act, 1985, restricts certain kinds of cannabis production and consumption. However, the Act also enables state governments to create rules for the cultivation and use of cannabis, particularly for industrial, medicinal, and scientific purposes. Consequently, a vast gap in cannabis law emerges between various states in India. Some states have a more lenient viewpoint. Uttarakhand, the first Indian state to legalise industrial hemp cultivation, was exempted from the NDPS Act in 2018 to boost its economy, as hemp is used in textiles, paper, and biodegradable products. Himachal Pradesh and Madhya Pradesh have shown similar interest in industrial and medical considerations.

Odisha, for example, permits cannabis-drink consumption due to the NDPS Act's exclusion of beverages from narcotics. However, the overwhelming majority of other states have completely prohibited cannabis use and consumption - leaves and resin. While Uttar Pradesh and Rajasthan do not allow cultivation, they permit the sale and drinking of cannabis drinks during Holi, indicating cultural acceptance rather than legalisation. Punjab, Gujarat, and Tamil Nadu are strictly prohibited states of both cultivation and consumption due to anti-cannabis and drug abuse enforcement.

But the wide debate about the medical and industrial applications of cannabis resulted some sort of relaxation of the law, with some states, including Madhya Pradesh, Manipur, and Himachal Pradesh, considering changes in cannabis policy. This legislation takes on the most significant reappearance in the state legal framework, with some states adhering to strict legalisation regulations. Some states are easing cannabis cultivation restrictions over time, while others stick to strict law and order positions.

ENFORCEMENT CHALLENGES AND GAPS:

The Narcotics Drugs and Psychotropic Act (NDPS) faces multiple critical failures, starting with its procedural inefficiencies, disproportionate punishments, lack of rehabilitation, and all the way to the violation of human rights within the system. The Act has failed to effectively deliver justice or address drug abuse as a public health problem. Slight obscurity in the Act and overlapping and coordination issues between different enforcement agencies like 'Narcotics Control Bureau' (NCB), 'State Police and Excise Departments', Customs and DRI give rise to various enforcement gaps and challenges.

AMBIGUITY IN LEGAL DEFINITIONS:

The NDPS Act uses very broad terms like 'cannabis plant' and 'marijuana', but the problem arises when the difference between non-psychoactive drugs and psychoactive ones is not clearly acknowledged based on the THC limit. For instance, hemp and

and marijuana both are known as cannabis plants, but they differ in their THC limit and hemp is known to be an industrial raw material, unlike marijuana, hence creating mass confusion and giving rise to the possibility that farmers of non-psychoactive drugs can be penalised.

PROCEDURAL DELAYS AND PROBLEMS WITH FORENSIC EVIDENCE:

A major challenge to NDPS enforcement is the delay in Forensic Science Laboratory (FSL) reports, critical in proving charges regarding drug possession and narcotics trafficking. The Supreme Court guidelines of 2013 ordered that speedy reports of seized drugs are to be produced, ideally within 15 days, to facilitate speedy trials, for which the accused persons spend more time in custody than what is constitutionally permissible. An inadequate number of dedicated Forensic Science Laboratories for NDPS matters exacerbates this situation, impinging on the rights of the accused for a fair trial and also leads to packed prisons with undertrial detainees. This delay is further exacerbated by the rigid bail conditions under Section 37 of the NDPS Act, where courts are prohibited from granting bail unless they are satisfied for sure that the accused has not committed the offence and is also unlikely to commit such an offence again. This places the burden at a much higher level than what is usually followed in criminal jurisprudence and has resulted in excessive preventive detention, particularly for the economically underprivileged sections. Recent Supreme Court judgments have reiterated the intent to relax these bail conditions, but legislative modifications have not kept pace with such judgments. This situation impinges on the rights of the accused to a fair trial and also leads to overcrowded prisons housing

SHIFTED BURDEN OF PROOF AND PRESUMPTION OF GUILT:

It is implicit in the wording of Sections 35 and 54 of the Act that the burden of evidence is shifted onto the accused and that once possession or involvement in drugs is proved, a case of guilt is made out. This reversal of the presumption of innocence makes a defence to drug charges very difficult. Most defendants do not have the resources or knowledge to disprove the charge, due to the complexity of proving the absence of knowledge or intent. This combination of burden shifting with strict bail provisions increases the likelihood of wrongful or prolonged detention.

MANDATED SENTENCING AND DEATH PENALTY PROVISIONS:

In addition to procedural constraints, the NDPS provides for severe, mandatory minimum sentences for drug offences, especially for commercial quantities. Section 31A prescribes the death penalty for repeat offenders who have been found guilty of large-scale trafficking, which is a very popular topic of constitutional debates on proportionality and human rights and is still operative. Such a fixed,

severe sentence ignores mitigating factors such as addiction, socio-economic background, and individual rehabilitation prospects. This rigid sentencing framework institutionalises a punitive model that does not distinguish between minor users and major traffickers and is harmful both to justice and to the public health approach that should underpin effective drug control.

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REGULATION OF MEDICAL USE HINDERS HEALTHCARE ACCESS:

The stringent control of the Act over narcotic substances intended for medical use makes patient care difficult. Physicians are burdened with an excessive number of licensing and record-keeping requirements, and fears of prosecution lead to the under-prescription of crucial pain management and addiction treatment drugs, such as morphine and buprenorphine. This makes the NDPS at odds with evidence-based medical treatments and undermines the scale-up of opioid substitution therapy. It ensures that patients have few options for treatment. The systemic barrier worsens the health status of individuals affected by chronic pain and substance dependence.

LACK OF PRIORITY ON REHABILITATION AND HARM REDUCTION:

The NDPS Act has several sections, such as Sections 64A, 39, and 71, which aim to provide immunity to addicts seeking treatment, establish treatment facilities, and provide probationary relief. However, these provisions lack proper implementation and remain only on paper. The rehabilitation facilities continue to be understaffed, to have inadequate infrastructure and have insufficient funds. Many addicts, instead of receiving health-oriented interventions, are tried and punished as criminals due to the greatly inadequate treatment and harm reduction services. This creates a vicious cycle for the addicts, who face social exclusion due to the punitive approach adopted, aggravating their addictions and creating an outcome that is the exact opposite of the policy objectives of the NDPS Act.

ENFORCEMENT POWERS AND RISK OF ABUSE:

The NDPS Act empowers the police to search, seize, and arrest, often without warrants. Aimed at ensuring effective enforcement, this also leads to significant misuse involving police harassment, overreach, evidence planting, and related breaches of the constitutional code of conduct. The socially and politically vulnerable groups face even more harassment in such cases, which reduces the public confidence in government agencies.

POOR AGENCY COORDINATION AND OVERBURDENED AUTHORITIES:

'Narcotics Control Bureau' (NCB), 'State Police and Excise Departments', Customs and DRI are the major agencies working towards the regulation of cannabis use in India. They are known to work independently without inter-agency coordination, leading to duplication of efforts and wastage of time and resources.

Police and NCB are overburdened with work and have been repeatedly indulging in petty cases of small possession, shifting their focus from cartel deals and large-scale drug traffickers.

EMERGENCE OF ONLINE AND DARK WEB TRADE:

Nowadays, physical transactions of psychoactive cannabis have become outdated, with a recent trend of dealings happening through dark web online marketplaces and encrypted social media channels. However, the main concern lies in the incompetence and lack of required infrastructure to tap and track such online transactions; non-specialised personnel indulging in such cases handicap the possibility of catching the traffickers. There is no formal and proper cyber forensic training given to the officials to monitor such trades.

SOCIAL STIGMA AND MARGINALISATION CONSEQUENCES:

The NDPS Act encourages the criminalisation model, further stigmatising drug users and deterring them from accessing health or social facilities. The result is social isolation of individuals and communities, perpetuating addiction, transmission of diseases such as HIV/AIDS, and imprisonment. The total costs to society and public health continue to rise, even though the NDPS aims to prevent drug abuse.

PROCEDURAL REQUIREMENTS OF THE NDPS ACT, 1985:

The NDPS Act, 1985, prescribes stringent procedural requirements necessary for the enforcement and prosecution of drug-related offences. These are important safeguards for the rights of individuals, and at the same time, are essential in accomplishing effective interdiction of illicit narcotic activities. Where information of narcotic drug offences is received, the IO has to register the case and send a report to superiors within 72 hours of receipt of the information to ensure accountability right from the beginning of the investigation. Section 41 empowers magistrates and gazetted officers to issue warrants or authorisations to conduct searches and seizures that should be based on written and verified information. In the absence of such authorisation, the searches can be conducted during exigent conditions under Section 42, but the IO should intimate the reasons for such a search and submit the report to the superior officer within the stipulated period. Section 50 is an important protection under the NDPS Act, preserving certain rights upon personal searches. A person being searched needs to be told expressively that he or she has a legal right to be searched in the presence of a magistrate or gazetted officer. The officer who is searching is supposed to inform him of this right and, if so demanded, make necessary arrangements for the presence of the magistrate or the gazetted officer. This provision intends to ensure dignity for the accused and protection against arbitrary searches. The failure to observe Section 50 would render the search invalid and the seized evidence inadmissible in court. All searches should be carried out in the presence of two independent witnesses who are not connected with the investigation. The seizure operation must be documented in a panchnama, detailing the time, place, persons present, description of seized items, and the circumstances leading to the seizure. This is vital in proving the chain of custody during the court presentation of the evidence. Under Section 52A, after seizure, the representative samples have to be withdrawn in the presence of a magistrate and sealed, signed, and sent for forensic analysis to ensure the reliability of chemical testing. The correctness of the samples and inventory is to be certified by the magistrate to ensure procedural integrity. Delays or improper handling of samples often lead to forensic objections, which can be fatal to prosecutions. The IO shall send the samples without delay, but not later than seventy-two hours, to the accredited laboratories, maintaining a documented chain-of-custody through all stages. Then, Section 52(1) requires that arrested persons be informed of the grounds of arrest without much delay. An arrested person, along with seized articles, should be produced before a magistrate without delay if an arrest is made with a warrant issued by him. Further, a full report following arrest or seizure should be sent to the immediate superior officer within 48 hours, lest the hierarchical system ensure flow and does not allow arbitrary or delayed enforcement. The IO is expected to file a charge sheet as soon as possible, normally within 60 days for non-commercial quantities

and 90 days for commercial quantities, so the judicial process starts quickly and effectively to achieve the aim of the Act.

LEGAL CASE STUDIES:

STATE OF PUNJAB V. BALDEV SINGH:
This landmark judgment in which the Supreme Court addressed the mandatory nature of procedural safeguards contained in Section 50 of the NDPS Act, 1985. The case arose from the arrest and search of Baldev Singh, who was charged with possession of narcotic drugs by the police without informing him about his right to be searched in the presence of a magistrate or gazetted officer. The Court declared that Section 50's stipulations were not mere technicalities but basic rights aimed at providing protection to an individual against arbitrary searches and misuse of powers. Its non-compliance, according to the Court, made the search as well as the evidence acquired because of such search inadmissible. The judgment laid down that procedural safeguards were intrinsic components of investigations and the fairness of the trial process under the NDPS Act. Inevitably, this case precipitated more rigid enforcement of Section 50 throughout the country, whereby accused persons are informed about their rights and magistrates or gazetted officers become participants in cases of searches upon request. Basically, this judgment forms part of the foundation for procedural justice within the realm of laws related to narcotics in India.

YUSUF V STATE 2023:
The Supreme Court's judgment in Yusuf v. State emphasised strict compliance with the requirements of procedural law, particularly Section 52A regarding the certification and sampling of seized narcotics. This case involved possession of a commercial quantity of heroin, but the Court acquitted the accused
on procedural grounds despite the huge seizure. Investigating authorities had failed to adhere to basic procedural formalities, such as applying in good time for sample withdrawal before the magistrate and properly sealing the samples. As pointed out by the Court, procedural safeguards cannot be compromised, and an infraction thereof can render evidence inadmissible, thereby demolishing the entire prosecution case. This view has significant implications for enforcement agencies; it demands strict procedural discipline in drug trafficking matters even where they involve massive seizures. It seals once again that the judiciary does not sacrifice the criminal justice process at the altar of an enormous seizure quantity.

THE ARYAN KHAN CASE, 2021:
Aryan Khan, the son of Bollywood star Shah Rukh Khan, was arrested in October 2021 by the Narcotics Control Bureau (NCB). The authorities arrested him during a raid on the cruise ship for drug possession and consumption. However, his own

personal possession did not identify any drugs, and the charges were made based on the WhatsApp chats and purported associations. The case cast doubt on the presumption of guilt, the refusal to offer bail by Section 37 and the discretion of the agencies. It emphasised the abuse of the provisions of the NDPS Act on persons who had no considerable evidence. Nearly one month in custody, Aryan Khan was put on bail, and the case was called off because of a lack of evidence. In this case, the necessity to reform the bail legislation and control over the arbitrary enforcement, in particular in cases of non-commercial quantities and personal use, was highlighted.

PUNJAB DRUG CRISIS:

Drug abuse and trafficking have been continuing issues in Punjab over the years. It is located near the Golden Crescent, which is a significant entry point to heroin and other drugs. The Punjab Opioid Dependence Survey 2015 revealed that in Punjab, over 230,000 individuals are opioid dependent, with the majority of them being young adults between 18 and 35 years (Ministry of Social Justice and Empowerment, 2015). The statistics and the official reports on the police reveal that even though the law enforcement effort is being made, the abuse of drugs in Punjab is increasing. According to NCRB, in 2022, Punjab was at the top of the list of the highest number of drug cases registered and fentanyl and heroin seizures (NCRB, 2023). The government and police have been arresting and seizing more, but the outcome has not seen a substantial decrease in the availability and use of the drugs. The most significant issue is that this crackdown is concentrating on low-level users and small-time operators as opposed to the large trafficking rings that are entrenched in the system through corruption.

AMENDMENTS TO THE NDPS ACT:

The NDPS Act, 1985, has undergone various key amendments to strengthen India's drug control framework and to address evolving challenges related to narcotic drugs. The first major amendment, in 1988, was for the purpose of providing more stringent punitive action against drug trafficking and related offences. It extended the purview of enforceable provisions to include forfeiture of properties of those

ealers and imposed more severe sentences, including the death penalty for repeat offenders trafficking drugs in commercial quantities. Special courts were also instituted through this amendment to expedite the trial process in NDPS cases, and remission or commutation in such cases was restricted as part of its tough stance against drug crimes. These steps moved India's drug laws closer to its international treaty obligations arising from the Single Convention on Narcotic Drugs and the Convention Against Illicit Traffic in Narcotic Drugs.

In 2001, the government realised the need to strike a better balance and thus inserted rehabilitative aspects into the NDPS Act in respect of drug users. This amendment enables the court to order first-time offenders apprehended with small quantities for personal consumption to de-addiction and rehabilitation programs instead of custodial sentences. It also relaxed the bail provisions in such cases, reflecting a shift in approach toward the medicalisation of drug addiction as opposed to viewing it solely as a criminal offence. This was a serious attempt at humanising the drug laws and reducing the dependence on prisons for addicts (Ministry of Social Justice and Empowerment, 2001).

The amendment of 2014 aimed to enhance medical access to essential narcotic drugs such as morphine and fentanyl, which are quite crucial for pain management and palliative care. It created a new category called "Essential Narcotic Drugs" and put their regulation under one roof, to cut red tape in licensing and distribution across states. This was expected to address long-standing problems of the availability of these drugs in hospitals and clinics for better patient care. The amendment also did away with the mandatory death penalty for repeat offenders, giving courts discretion to impose 30 years imprisonment in such cases, and increased the maximum punishment for possession of small quantities from six months to one year in prison. The amendment further opened up the role of the private sector in the processing of opium and made the laws of confiscation against properties of traffickers more stringent, with the intention of hitting the financial foundations of the networks.

In 2021, the Ministry of Social Justice and Empowerment proposed further reforms to the Act through various proposals and the NDPS Amendment Bill. The proposals were made to differentiate between users and traffickers in the drugs trade, advocate decriminalisation of possession for personal use, and take strict action on commercial trafficking. The proposals emphasised the scaling up of community-based rehabilitation and harm reduction strategies that include needle and syringe programs (Ministry of Social Justice and Empowerment, 2021).

04

ECONOMIC AND INDUSTRIAL POTENTIAL

ECONOMIC AND INDUSTRIAL POTENTIAL

AGRICULTURE AND CULTIVATION

Cannabis is a strong and hardy plant that grows in both temperate and tropical climates. It is found in a variety of environments but thrives in the presence of loose and rich loamy soil with an ideal pH range of 6.0 and 7.0. The cannabis plant has a relatively short growth cycle with some varieties maturing in 3-4 months. Due to several properties of the cannabis plant, such as its ability to assist in killing weeds, its capacity to grow quickly and without requiring pesticides, its cultivation is said to be sustainable. It increases soil fertility and pollination, which makes it a farmer-friendly crop. Its adaptability allows easy cultivation across different regions and the diverse climatic conditions of India. The cannabis plant has the ability to adopt different characteristics on the basis of the altitude and climatic conditions under which it grows, due to which there are several regional variations of cannabis across the country.

Both wild cannabis and dedicated cultivation areas for cannabis can be found in the Himalayan region, which include states like Jammu and Kashmir, Himachal Pradesh, and Uttarakhand, among others. While Jammu and Kashmir does not have dedicated areas for cultivation, wild cannabis is often found, which fails to reach maturity due to human involvement.

Himachal Pradesh and Uttarakhand have widespread cannabis presence, as it is available both in terms of wild plants and illicit cultivation. While natural cannabis often gets destroyed by enforcement agencies due to its narcotic potential, drug trafficking and illegal trade of cannabis remain rampant. Uttarakhand has given licensing for the cultivation of cannabis (hemp) for industrial, medicinal and scientific purposes. Himachal Pradesh has also recently permitted two institutes to conduct research on cannabis under controlled conditions.

The Indo-Gangetic region, including states like Punjab, Haryana, West Bengal and Uttar Pradesh, has the inherent environmental conditions to foster cannabis cultivation as evidenced by the presence of natural cannabis throughout this region; however, state licensing is a hurdle that

needs to be tackled.

Apart from this, the Deccan region, such as Madhya Pradesh and Chhattisgarh, and north-eastern states like Assam, Manipur, Sikkim, Nagaland, and Arunachal Pradesh also foster the climatic conditions to cultivate this plant.

AGRICULTURAL PRACTICES AND CONDITIONS

Cannabis can either be used to cultivate recreational products such as Hashish, Marijuana and other cannabis preparations or industrial hemp. As mentioned before, the production of Hashish and Marijuana is illicit in India, and the production of certain preparations of cannabis leaves and industrial hemp is legal, subject to state policy.

Though the cannabis plant grows wild in many parts of India, it has to be properly cultivated to obtain, for commercial purposes, its fibre or its narcotic principles, as the case may be. For a good growth of the cannabis plant, a rich, friable loamy soil, moist but not shady, is selected. The soil is amply manured with stable-yard manure rich in cow dung. When the plant is cultivated for the production of marijuana, the soil is repeatedly ploughed and prepared into ridges one foot high and one foot apart. Seeds are sown on bright or sunny days in August. Seedlings are usually 6-12 inches high when they are ready for transplanting by the end of September. Trimming of the plants begins in November and consists of lopping off the lower branches to favour the upward growth of the shoots. All weeds are removed, and when the plants begin to form flowers, the services of an expert known as a "marijuana doctor" ("Paddar" or "Parak-dar") are requested. He goes through the field cutting down all staminate (male) plants, leaving what are colloquially known as "madi" (female) plants.

This operation is of the greatest importance in preventing seed formation. The presence of even a few staminate plants in the field may suffice to damage the entire crop, since in that case, fertilisation of the female plants takes place, and most of the flowers run to seed. The marijuana yielded by such plants is of poor quality and scarcely saleable. The female plants come to maturity about the beginning of January, but the marijuana is not fully developed till a month later. The crop intended to be made into what is technically known as "flat marijuana" is harvested a few days earlier than that for " round marijuana ".This procedure of cultivation of cannabis is the one that Indian farmers followed before the cannabis regulation was imposed in 1985.

Although the cannabis plant, when cultivated in tropical regions such as India, Africa and Malaysia, is rich in narcotic principles, it seldom yields sufficient resin

to be collected as hashish. Hashish is sometimes collected on the plateaus of central Asia and the southern Himalayas (Nepal), but both the yield and the quality are poor. The highest yield and best quality of hashish resin are obtained from plants grown in Yarkand, in Chinese Turkestan, in Central Asia.

FARMER WELFARE

An important area to be covered while discussing the potential of cannabis cultivation is the impact on farmer income. Cannabis remains an economically valuable crop with increasing demand, whether it be in the legal or illegal avenues. However, it comes at the cost of several social implications, which need to be weighed against its economic benefits. The health implications of cannabis are quite complex, with research showing both positive results, like pain relief and negative results, like addiction and mental health risks. Further, the illicit nature of the trade makes it unstable and dangerous. There have been many cases where cultivators of cannabis would become addicted to it either consciously or unconsciously. Furthermore, the moral corruption by the social or religious leaders makes cannabis cultivation more undesirable.

Despite the severe social and legal hurdles, many Indian farmers would resort to illegal cannabis cultivation for a higher income. Due to the absence of alternative sources of livelihood, farmers often risk fines, arrest and police harassment to sustain themselves. Cultivation of other grains is often less lucrative, so farmers would often grow cannabis deep in the hills or other remote areas to prevent getting caught by the authorities. However, the fear of police raids, income in the form of black money which cannot be used freely and the impact on social status due to cannabis cultivation often cause many farmers to switch trades or find other crops to grow. Individual stories often speak of a conflict between cannabis being a cultural heritage and a crop being cultivated for centuries, which may provide an additional stream of income, and cannabis being a prohibited substance under national law. From the perspective of the locals and the farmers, the national law undermines their heritage and robs them of potential income sources, as evidenced by the demands of farmer groups and representatives for the relaxation of cannabis regulation.

In conclusion, all the stakeholders would have different goals - farmers would require higher incomes via cannabis production to be able to improve their standard of living, the social and religious leaders would be against this as they perceive it as a way of earning “easy” money, the government would not want unlawful activities to become a source of livelihood and would want to promote alternate livelihood options, and the public in general would be

concerned about the health and environmental risks of cannabis production.

KEY ASPECTS

The enactment of the NDPS Act was a major disruptor in the lives of the cannabis farmers. Most were reliant on cannabis for income and were forced to find other revenue streams. This act caused the entire cultivation process to go underground and exposed the farmers to many risks. The marginal farmers suffered the most, as they had to bear the brunt of police harassment for growing cannabis illegally, whereas the bigger farmers could escape by paying bribes. The farmers belonging to the Himalayan region often failed to find any other revenue source and had to continue with the illicit cannabis cultivation, adding legal problems to the already hard lives experienced by the inhabitants of mountainous areas. In light of this, the following are some key aspects that should be considered while discussing the cannabis policy from the perspective of agriculture:

While in the current scenario, legalising the cultivation of cannabis seems like a topic to discuss way ahead in the future, discussing the relaxation of cannabis laws for specific purposes by states, as done in Uttarakhand and now in Himachal Pradesh, is important to help solve the plight of cannabis farmers. Such relaxations must consider the economic status and cultural background of these farmers while ensuring the maximum benefit is absorbed by small- and medium-level farmers. If an increase in income due to cannabis production is accrued to the large farmers, then the objective of such a policy change would fail.

Any change in the cannabis policy must also consider the environmental implications of cannabis cultivation. While the exact details of this would be covered in later sections, since many cannabis farmers would be based in hilly areas, which are ecologically sensitive, especially the Himalayan range, which is one of the hotspots for cannabis cultivation, greater care is required to ensure commercial farming of cannabis does not disturb the natural order of such places.

Research on cannabis, especially in the context of agriculture and cultivation, is also something policymakers need to focus on. Agronomic studies that focus on crop cultivation should be carried out to understand and improve cannabis cultivation across the different kinds of regions in which it can be cultivated. While a few states have begun focusing on this aspect, it can certainly be expanded to other states and given more priority.

Despite the rich cultural background of cannabis, many farmers in the Himalayan regions have grown cannabis for commercial purposes and not for religious purposes. Since life in such areas is hard and strenuous, the dependence of farmers on cannabis cultivation is high. It is

important that government policy treats such farmers in a more humane and less harsh manner, or is able to provide alternative sources of revenue. The government has to either relax controls on cannabis or introduce new crops with comparable returns.

While current policy relies on punishment and destruction, which often proves to be more expensive and inefficient as it targets only portions of the total cannabis cultivation, newer policies should aim at education and counselling. Farmers could be educated about the public health concerns associated with cannabis and other risks of cannabis cultivation. Cannabis yield can also be purchased by the government itself to minimise leakage of cannabis into the illicit markets, control the supply of cannabis and provide secure sources of revenue to farmers.

MEDICINAL AND PHARMACEUTICAL USE

The history of cannabis in India cannot be separated from its cultural, religious, and medicinal heritage, going back to recorded history. As it is referred to in Sanskrit as Vijaya (the victorious one) or Cannabis drink, the plant holds a unique place within the Indian subcontinent. While cannabis was known in India as early as the 4th or 3rd centuries BC, the same references can be seen in the earliest classical Ayurvedic texts, such as the Charaka Samhita, its use as a major therapeutic agent is limited. Its significant usage in the Materia Medica of classical Indian medicine came in later compendiums, mainly influenced by Unani Tibbi.

- Purification (Shodhana): Cannabis was regarded by the practitioners of Ayurvedic medicine as a toxic material (visha dravya). Therefore, it was rarely taken directly,
- Formulation and Administration: The plant parts used were essentially the leaves and fruit, and formulations were almost always taken by mouth (e.g., tinctures, pills) to avoid smoking, for medical application.
- Therapeutic Indications: In Ayurveda, cannabis was used for a wide variety of treatments by maintaining balance among the three functional energies of life called doshas.
- Digestive Disorders: To promote an appetite (deepana), aid in digestion (pachana), or cure diarrhoea.
- Pain and Inflammation: For analgesic and anti-inflammatory effects, especially in diseases such as rheumatism, as well as to alleviate chronic pain.
- Nervous System: An Opioid used as a sedative, antispasmodic, or to treat nervous system ills.

MODERN RELEVANCE OF TRADITIONAL CANNABIS FORMULATIONS IN INDIA:

The long-standing use of cannabis (or Vijaya) in traditional Ayurvedic

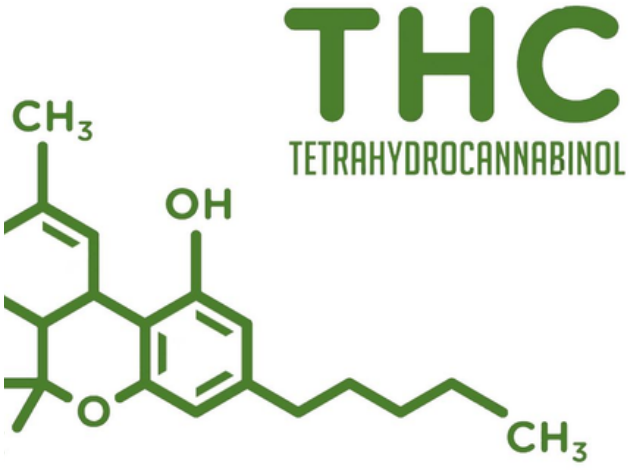
formulations meets substantial challenges in today's world, primarily because the Narcotic Drugs and Psychotropic Substances (NDPS) Act, 1985, was enforced. This central law, enacted to bring India into line with international drug treaties, criminalised most forms of cannabis,, particularly the flower (Cannabis flower) element and the resin (Cannabis plant).This strict medicine strangled the supply chain for the raw material of cannabis. The basis for a potential resurgence is contained in a critical legal and cultural nuance previously overlooked. However, the NDPS Act specifically excludes Cannabis drink, the preparation made from the leaves and seeds of the plant, from the definition of a narcotic drug. Thus, this exception carves out a small but important niche to allow traditional cannabis use, insofar as the leaves and seeds can be used for medical and scientific purposes. The legal loophole has facilitated the manufacture of some Ayurvedic drugs containing Cannabis drinks, regulated under the Ministry of Ayush and state-specific licensing authorities. However, manufacturers face a "commitment to keep virgin fields virgin": even the exempted parts of this plant are subject to strict controls on sourcing and interstate transport. And yet, the hurdles notwithstanding, there is a visible and growing movement to integrate this traditional knowledge with modern science. The Indian government has tentatively begun to acknowledge the plant's therapeutic potential and even to make licensed use of it, with premier institutions such as the Indian Institute of Integrative Medicine (IIIM) gaining permission for research into cannabis-based products treating conditions as diverse as epilepsy and cancer. This research aims to remedy one of those constraints: quality controls can be used over individual cannabinoids, such as THC and CBD, to ensure they are present in correct amounts. The convergence of traditional medicine and modern pharmacology is driven by global interest in cannabinoids for chronic pain, neurological disorders and gastrointestinal problems- all indications for which Vijaya was prescribed in classical texts. These ongoing clinical trials in India, however, were riddled with complex regulatory and ethical frameworks involving the Ministry of Ayush on each side at once, which did signal a gradual, though cautious, shifting of ground. This changed regulatory environment is trying to knit together an integrated structure, respectful of the thousands-year-old Ayurvedic use of Vijaya, and at the same time requiring all new formulations to meet modern standards of safety, efficacy and consistency for entry into mainstream healthcare.

Ancient Mysteries: The earliest written records of cannabis flower use are in the Atharvaveda (c. 200-1400 B.C.), where it ranks as one of the five most holy plants on earth. Appearing first in Ayurveda

producing their narcotic resins referred to by Westerners in India as Cannabis flower (Cannabis flower being originally adopted from an Indo-Arabic word popular amongst Jamaican aficionados) is deeply rooted in the history of hemp

DISTINCTION BETWEEN HEMP (INDUSTRIAL PURPOSES ONLY) AND PSYCHOACTIVE CANNABIS FROM A HISTORICAL PERSPECTIVE IN INDIA

First created in writing, the dichotomy between this variety of cannabis, which was grown actively for its fibre and producing seeds historically called Hemp and is thus described as Sativa, and the sort of plant producing their narcotic resins referred to by Westerners in India as Cannabis flower (Cannabis flower being originally adopted from an Indo-Arabic word popular amongst Jamaican aficionados) is deeply rooted in the history of hemp cannabis harvest. At the same time, it precedes modern plant taxonomy and, i.e., Latin



terminology as we know it today by millennia.

Although both types belong to a single species of Cannabis, their respective uses, as well as cultivation measures based upon these applications, plus indeed pharmacological properties, produce contrasting products that have continued for many thousands of years. It all comes down to the plant's chemical composition, particularly THC concentration - the cannabinoid that causes psychoactive effects.

Psychoactive Cannabis, or the strains which produce Cannabis flower (the flowering tops) and Cannabis plant (the resin or hashish), is extremely rich in THC. Man-made species of hemp plants. Some of these were bred for their particularly dense sticky flowers and an especially high resin content across the entire plant in order to give them maximum effect in intoxication or medicinal use. Thus, directly produced intoxicating medicine, which also made a great contribution to the development of this new agricultural technology, as well as spawning many similar set-ups elsewhere around the world. Shaped cultural symbols such as temples and mountain passes, monasteries and great cities arose from structures initially made of hemp paste with a carbonised wood skeleton.

This rich form of the plant formed a central part of specific traditions - it might be

ingested by sadhus and yogis to help aid meditation, and its record in Ayurvedic medicine extends back perhaps 50 centuries, with the latter culture concentrating on its profound influence upon mental disorders ahead of interpersonal relationships. Always for the people to make a livelihood out of their hemp, it wasn't just about a production price point.

Industrial hemp, or non-drug Cannabis, has traditionally been defined by its negligible THC content. One ancient variety, the choicest sort of this plant, has hips four feet or more in circumference and up to sixteen feet tall. Leaves are of moderate size, irregularly and deeply lobed with sharp saw-toothed edges that might even be doubled up at leaf margins. The emphasis in breeding programs focused particularly on profit generation lay in the removal of flowers and leaves from plant stalks. Huge sales were made of these fine quality fibres produced daily, with no connection to resin fibre production. Consider that hemp seeds (their fruit) rank high amongst staple foodstuffs for a majority of humanity, and the oil they contain is used in folk medicine, then it becomes clear that resins are unable to replace their unique character. This would have been a reflection in reality of legal distinctions that had grown up earlier in history.

The flowering tops of the cannabis plant, with its drug-potent resin, were specifically regulated or the subject of spiritual homage because they were capable of carrying out these functions effectively. The British Indian government, in the late 19th-century Indian Hemp Drugs Commission Report, documents this tripartite cultural use: Cannabis drink (prepared from leaves, less potent), Cannabis flower (flower tops) and Cannabis plant (resin, most potent). Indeed, the Narcotic Drugs and Psychotropic Substances (NDPS) Act of 1985, even now with settled Indian law, draws a statutory distinction that exempts the mature stalk and separated seeds from the definition of a "narcotic drug". This legal framework is essentially equivalent to the historical and practical Indian distinction: industrial hemp is recognised as a non-drug commodity by law, whose fibres and nutritious seeds all may freely be employed, while those parts which contain high resin (THC) are strictly regulated.

Thus, the separation is not just a present-day legal nicety but a practical one imposed by necessity: one variety is meant to be used for its stalk and seed (industrial/human nutrition) while the other is designed to produce resin and flowers (medicinal/religious/recreational). This dual history is reflected in India's policy and cultural perspectives on the plant.

ECONOMIC AND INDUSTRIAL POTENTIAL

While the previous section discusses the cultivation and scope of cultivation of cannabis for recreational purposes, this

section will discuss the details about industrial hemp, the impact of cannabis cultivation on allied industries and the scope of cannabis in various

INDUSTRIAL HEMP

Industrial hemp can be specifically defined as those varieties of the cannabis plant that have THC content of less than 0.3 per cent. Despite the several uses of help which date back to 5000-4000 BC, after the worldwide regulations imposed on cannabis in the 20th century, the potential of industrial hemp went to waste. However, as industrial hemp is being classified separately from psychoactive hemp, there is a resurgence of industrial hemp, especially in the Western world.

TEXTILE

Since ancient times, hemp has been used to produce textiles due to its ability to resist pests, cultivate without the use of pesticides and herbicides and the possibility of cultivation in wide-ranging geographical environments. After growing the hemp plants, the first step of industrial hemp textile production involves retting, which involves the removal of pectin(a natural impurity) by fostering bacterial or fungal growth to break it down. This can be done by soaking it in warm water or using the combined action of dew, sunlight and air by leaving it to dry in the open. After the removal of pectin, the hemp plants are beaten to extract the fibres, which are then combed and spun to form threads. To understand the potential of hemp in the textile industry, a comparative analysis can be done with cotton, which is the most commonly used natural fibre. The table on the next page can be used for this comparative analysis.

BASE	HEMP	COTTON	REMARKS
ENERGY REQUIREMENTS	The energy required to produce one metric A ton of spun hemp fibre ranges from 15,009 MJ to 32,622 MJ (for traditional and organic processing, respectively) (Charret et al., 2005). Since processing technologies for hemp fibre are still new, the energy requirements are expected to go down in the future.	The total energy requirement to produce cotton varies from 11,711 MJ (for organic cotton) to 25,591 MJ (for conventional cotton grown in a high energy use system) (Charret et al., 2005). The higher use of energy is due to the use of fertilisers, herbicides and water irrigation systems.	It can be concluded that energy requirements for the production of hemp are lower than production of cotton, and it is expected that the difference will increase with technological improvements in hemp production.
CARBON DIOXIDE EMISSIONS	It is estimated that the production of 1 metric ton of spun hemp fibre produces 2-6kg of CO2 emissions.	It is estimated that the production of 1 metric ton of cotton fibre produces about 2.5-5.5kg of CO2 emissions.	It can be concluded that hemp and cotton production release similar amounts of CO2.
WATER REQUIREMENTS	1kg of hemp fibre requires 2041-3401 litres of water.	1kg of cotton fibre requires 9758-9958 litres of water.	Production of cotton requires about 3 times the water as production of hemp.
ECOLOGICAL FOOTPRINT	Hemp fibre represents a low ecological footprint with 1.46-2.01 gha	The ecological footprint of cotton fibre ranges from 2.17-3.57 gha.	As seen, the ecological footprint of hemp is lower than that of cotton, which may be linked to the difference in yield.

YIELD	The range of final fibre of hemp produced in one hectare of land is 1-5 tons.	The range of final fibre of cotton produced in one hectare of land is 0.8-0.93 tons.	Hemp yield is significantly higher than cotton under suitable conditions.
RESEARCH & DEVELOPMENT	Technological research and agronomic studies for hemp are still new, and practices for cultivation, logistics and processing are not well-developed.	Research on cotton cultivation and practices for logistics and processing is quite established.	Since the hemp industry is still fledgling compared to the cotton industry, a lot more variables exist for which sufficient research is not available.
PESTICIDES & HERBICIDES	High-density cropping ensures resistance to weeds. Furthermore, hemp is naturally resistant to pests, but they do become an issue in the case of large-scale farming. However, this can be easily managed by crop rotation.	Cotton plants are one of the most pesticide and herbicide-intensive crops. They are highly prone to pests and weeds and require large amounts of pesticide and manual labour to manage them.	Since, use of chemicals for cotton cultivation is significantly higher than for hemp cultivation, it drives up the total cost for cotton as compared to hemp.

Some important points for the above analysis

- Carbon dioxide emissions refer to the amount of carbon dioxide released (in kg) per metric ton of crop due to the energy requirements of cultivation.
- The ecological footprint is the amount of bio-productive area (land and sea area), measured in global hectares, needed for production, and to absorb waste and emissions (Charret et al., 2005).
- The ecological footprint takes into consideration the demand for land area compared to the available supply on earth, measured in the world average productive hectare (gha)
- Crop rotation can be done every four years and also helps in removing heavy metals from contaminated soil.

PAPER INDUSTRY

The importance of pulp from non-wood

resources to manufacture paper has become significant in an attempt to preserve the green cover. It has many advantages, such as the easiest pulpability, excellent fibres for speciality papers and higher quality bleached pulp. It can be used as an effective substitute to avoid decreasing forest wood resources. Hemp can be used to manufacture several high-value papers such as teabag and coffee filters, electrical insulation papers, cigarette papers, wax match papers, glassine and grease-free papers and condenser papers. However, the manufacture of such papers requires suitable technologies, which are currently lacking, along with which, the logistics of this entire process need to be sorted properly.

Hemp is considered more suitable than wood for papermaking due to its higher cellulose and lower lignin content. The outer layers of the hemp stalk, or the bark, contain about one-third moderately long fibres, which are ideal for producing strong paper. “Hemp can contain up to 85% cellulose, significantly more than wood, which contains only about 30%. Additionally, hemp's lignin content ranges from approximately 5% to 24%, which is lower than wood’s 20% to 35%, making the pulping process easier since lignin needs to be removed before paper production. The process of making paper from hemp consumes less water and energy and proceeds faster than wood-based papermaking. Furthermore, hemp paper is

more durable and resistant to yellowing, cracking, and deterioration over time compared to paper made from wood pulp, which is more affected by ageing." (Producing Paper From Hemp – the Case of Hahnemühle Using Ancestry Old Process, 2024)

CONSTRUCTION

Another important use of Hemp can be in the construction industry in the form of Hempcrete. This is a bio-composite material made with the combination of woody core of the hemp plant(hemp hurds or hemp shives), a lime-based binder and water. Its strength lies in its environmental and thermal properties and, depending on the exact mix used for preparation, can be used in walls, floors and roof insulation. It has been emerging as a sustainable alternative to traditional concrete and insulation materials, especially in Europe. An advantageous property of Hempcrete is its "breathable" property which helps it to ensure a comfortable and healthy indoor environment while adding to its durability and sustainability. Under this property, Hempcrete regulated the indoor humidity by absorbing and releasing moisture, which prevents moisture buildup, prevents mold growth, and establishes healthy airflow within buildings.

However, Hempcrete also has its own flaws including low structural strength which necessitates a separate structural framework, insufficient availability and a longer curing time(duration in which cement is allowed to set by maintaining proper temperature and moisture, which ensures a longer lifespan of the structure. Hempcrete represents a pivotal point in the future of green construction that can help in attaining net-zero carbon emissions in the construction process.

TOBACCO INDUSTRY

While the effects of cannabis on health are a widely debated topic, there is no doubt about the risks posed by tobacco. Its consumption can lead to severe respiratory and cardiovascular diseases, and also increases the risk of several types of cancer significantly. Production of cannabis in a state, especially for recreational purposes, will have a significant impact on the consumption and production of tobacco and thus alter the market position of tobacco industries.

The impact of tobacco and cannabis on each other can be explained by the drug gateway theory and reverse gateways. Drug gateway theory states that regular use of a soft drug like cannabis can 'lower the threshold for addiction' to harder drugs like opium or heroin. Similarly, regular use of tobacco can act as a "gateway" to substances like cannabis, especially among the youth. This is because of the shared root causes of addiction, such as

environmental exposure, trauma, thrill seeking and genetic predisposition.

'Reverse gateways' would refer to the initiation of use of tobacco after exposure to cannabis. As the name suggests, this effect is the reverse of the drug gateway theory, where regular use of cannabis directs the user to nicotine dependence and addiction. There is a lot of data correlating cannabis to tobacco and hard drugs, as mentioned. A study in the US reports that "Cannabis use was associated with increased cigarette smoking initiation, decreased smoking cessation, and increased smoking relapse among adults in the United States." Furthermore, the relation between cannabis and tobacco use is said to flow in both directions, with adults who smoke being more likely to use cannabis and adults who use cannabis being more likely to smoke tobacco.

On the other hand, it is argued that cannabis can be used as a "substitute" for tobacco.
Despite the arguments regarding the side effects of cannabis, it is generally believed that tobacco is more harmful. In regions where cannabis was legalised, the aftermath included a rise in consumption of recreational cannabis and Electronic Nicotine Delivery Systems(ENDS), whereas cigarette use showed little change. However, since ENDS can be used to consume both tobacco and cannabis, an increase in their usage can be attributed to either cannabis legalisation or a rising trend of e-cigarettes among the youth or both, and a direct impact of cannabis and tobacco on each other can't be concluded. In conclusion, while the impact of cannabis legalisation on tobacco consumption can't be expressed in quantitative terms, most studies agree that cannabis legalisation can lead to an increase in the joint use of the two substances, posing significant health risks.

In India, the tobacco production stood at 820 million kg as of 2021-22(India Brand Equity Foundation, 2025) and is a significant economic contributor. In general, the tobacco industry would view cannabis as both a potential rival and an opportunity for diversification. This is because cannabis can pose a threat to current tobacco products, but also provide new avenues in the form of marijuana infused products. A major concern about cannabis legislation is the entry of big market players into the cannabis industry. While cannabis is reported to have lower rates of morbidity and mortality as compared to substances like alcohol and cigarettes, the tobacco MNCs would have the capacity to engineer marijuana products to the best efficacy.

For example, the modern-day tobacco products, to maximise consumer dependence and thus, drive up sales. While the exact response of the tobacco industry to cannabis legalisation cannot be apredicted, the above concerns need to be

onsidered as tobacco companies possess enough market power to convert cannabis into a "tobacco-style" public health concern. The tobacco industry's possible attempt to create products with maximum addictiveness and the large marketing campaigns they can do, partnered with the long-standing history of cannabis in India, could turn out to be a major concern.

TAXATION AND REVENUE POTENTIAL

India's cannabis-linked economy is not a single unified market, but rather three legally operating segments: formal medical cannabis, wellness and CBD products, and industrial hemp, along with the far larger illicit recreational market. Each has its own economic weight, with different implications for taxation, and it's only when these are clearly understood that international comparisons of taxation models can be made, or any estimates about India's future revenue potential are calculated.

The formal medical cannabis sector currently represents the smallest of the legally operating segments. It was valued at USD 8.8 million in 2023 and is projected to reach USD 190.5 million by 2030 (Grand View Research, 2023). Its small size reflects the procedural difficulties involved in running clinical research and obtaining institutional approvals.

The wellness and CBD segment is much larger and commercially more active. In 2024, the market was valued at USD 228.8 million and is projected to reach nearly USD 800 million by 2033 (IMARC Group, 2024). This segment includes CBD oils, isolates, concentrates, hemp seed-based nutraceuticals, and various topical formulations. The main reason behind this growth is that the products derived from hemp seed or non-psychoactive extracts are under clearer rules and food safety notifications. They fall into India's GST and consumer product taxation channels, making the segment straightforward to regulate and tax.

Industrial hemp constitutes the single largest legitimate part of the cannabis economy. Drawing from your valuation, this market is valued at USD 229.93 million in 2024 and is projected to reach USD 1.6 billion by 2032 (Credence Research, 2024). Put together, these three segments form the current legal and semi-legal cannabis-related economy in India. Their valuations create a clear, coherent picture of the economically active part of the sector and also provide a reliable basis for understanding what the scale of legally regulated activity is in the country.

In order to understand how India might design a taxation regime for cannabis, it is instructive to examine the approaches

followed in Canada and the United States. Canada has one of the most formalised national systems operating within a federal framework. Upon legalising recreational cannabis in 2018, Canada implemented a dual tax regime that combined the federal Goods and Services Tax with a dedicated federal excise duty on cannabis. The excise duty was structured as "the higher of" a flat rate, for example, CAD 1 per gram of cannabis, or an ad valorem rate of 10 per cent of the sale price. The agenda behind using this model was twofold. Firstly it ensured a minimum revenue floor and secondly assisted in capturing additional value from higher-priced products. Another initiative was the establishment of a revenue-sharing scheme under which, the provincial government would receive 75 per cent of the excise revenue and the federal government would receive 25 per cent, capped at CAD 100 million. This structure was adopted to encourage participation of provincial governments as they are as they are responsible for licensing, enforcement, and retail operations.

The Canadian experience becomes relevant for India as both countries operate in federal systems where the states carry key administrative functions, with the central government retaining control over the regulation of narcotics. The Canadian model demonstrates a dual tax structure that can achieve a balance between revenue stability and market competitiveness, with states receiving an appropriate share of the accruing revenue.

The United States provides a contrasting example. Because cannabis is not federally legal in the United States, each state has developed its own way of taxing it. There exist three main approaches to taxation: ad valorem taxes, weight-based taxes, and potency-based taxes. Ad valorem taxation is easy to administer, but it becomes vulnerable when companies are vertically integrated. Firms that grow, process, and sell cannabis under the same ownership can manipulate internal transfer prices to reduce taxable wholesale values. Several states, including Colorado and Washington, responded to this challenge by moving toward or augmenting their systems with weight-based taxation. Weight-based taxes ensure predictable, stable revenue because they are based on the physical quantity of cannabis rather than its declared sale price.

The United States experience well illustrates that ad valorem wholesale taxation alone can create loopholes in markets with considerable vertical integration. Consequently, for a country like India, it would be more prudent to adopt a hybrid taxation structure that includes both a weight-based component and an ad valorem element. Such a combination would avoid transfer pricing issues and ensure that premium products make an equitable contribution to tax revenue. After examining the international models, the next step is understanding India's potential revenue from the cannabis sector. The most transparent and credible estimates come from actual consumption patterns in New Delhi and Mumbai. These two cities were included in the 2018 Cannabis Price Index study (Sharma, 2019), which makes available a good amount of information on consumption and pricing. According to it, New Delhi consumes 38.2 to 38.3 tonnes of cannabis every year (Sharma, 2019), while Mumbai consumes approximately 32.4 tonnes. These numbers place both cities among the highest cannabis-consuming cities in the world. Retail prices of approximately ₹315 per gram in New Delhi and ₹329 per gram in Mumbai were recorded during the study. Using these figures, two taxation scenarios were calculated. The first applied a high tax model, similar to cigarette taxation. Under this structure, New Delhi could generate approximately ₹725 crore in annual tax revenue, with Mumbai generating approximately ₹641 crore. The second applied a moderate tax rate, similar to the average cannabis tax burden across the United States. In this latter structure, New Delhi's potential annual revenue would be approximately ₹225 crore, and that of Mumbai around ₹199 crore (Sharma, 2019). Even under the conservative model, the two cities together account for approximately ₹424 crore in unrealised annual tax revenue. This estimate only considers current consumption and does not assume an increase in use under regulation. These projections, therefore, indicate the impressive tax potential of the cannabis market. Already, India's legal cannabis-related sectors, which together total around USD 470 million, demonstrate clear economic activity. At the same time, the illicit market, measured using rob city-level consumption data, shows that a substantial volume of transactions currently remains outside the tax net.

TRADE AND EXPORTS

The global hemp economy has undergone a substantial transformation, shifting from a niche agricultural product to a large-scale industry raw material with diverse uses in textiles, construction, medicines, bio-composites, etc. This, in turn, has created a high demand for high-quality hemp fibre, seeds and medicinal extracts. India, which possesses both historical familiarity with hemp and favourable climatic conditions, presents a high-value export opportunity that can help the nation in terms of global market trends. The industrial hemp market has shown positive trends in its expansion in the international market after the liberalisation of hemp cultivation in the US in 2018 and European countries' diversification into natural fibres. Industrial hemp is currently and majorly traded internationally in the form of:

- Fibre
- Hemp hurd (construction grade hempcrete)
- Seeds & oil
- Medicinal extracts

India has an advantage in the global market for hemp and has the potential to become a competitive global supplier. Currently, the hemp fibre production is dominated by China, however, it faces hurdles like high labour cost and rising environmental regulation. On the other hand, India can provide cheaper labour, lower input costs and large agricultural land due to which, it can cut global prices and maintain quality. Several states such as Uttarakhand, Uttar Pradesh, Himachal Pradesh, Rajasthan and the North-Eastern region present the necessary environment for hemp cultivation. However, these states remain to be untapped, as industrial hemp can be grown here on a large scale.

India's proximity to Middle Eastern, European and Asian markets reduces shipping time and costs compared to other exporters like Canada and the US. Therefore, India can become Asia's second-largest exporter after China and possibly even rival it in segments such as textiles and Ayurvedic-based products. India's competitive advantage goes well beyond agriculture. Global consumers increasingly prefer natural, organic, and traditional wellness products, areas where India is already a trusted supplier.

A strong differentiator for India on a global level is its ability to combine hemp with medicines and wellness products based on Ayurveda. As far as regulation goes, India is one of the few countries that allows the use of hemp leaf (Vijaya), and its permission is given for medicinal purposes and therapeutic purposes due to its demonstrated use in Ayurvedic formulations. As a result, Indian firms are uniquely positioned to develop varied value-added products under enabling regulation. Supplemental options, like ayurvedic drugs and oils, anxiety- and

sleep-aid supplements, and topical creams and balms. This way, India has an exclusive pull in the global hemp value addition chain, particularly in medicinal and wellness products.

The international demand for hemp-based products is growing at a worldwide level. The imports of hempcrete and hemp fibre products are steadily increasing in European nations like Germany, France and the Netherlands. Increasing use of hemp in sustainable construction and consumer goods manufacturing is driving the growth of hemp testing. Japan and South Korea are now becoming potential high-growth markets for nutraceutical hemp seed products.

In these changing global circumstances, some interesting market gap opportunities are open for India. India can emerge as a more economical supplier of low-cost hemp fibre, which is currently mostly supplied by China. Premium international demand for organic hemp seed oil presents an excellent business opportunity. The use of hemp as a medicinal extraction invokes Ayurvedic positioning, which is a powerful niche for India (again, few other producing countries can claim this differentiation). The use of bio-composites and other new hemp applications is growing in the car, packaging and other industries.

ENVIRONMENTAL IMPACT

Industrial hemp acts as a very efficient converter of atmospheric carbon dioxide into plant biomass in a short annual growth cycle. It completes its maturation in ninety to one hundred twenty days and produces substantial biomass during this period. Annual sequestration ranges between eight and twenty-two tonnes of carbon dioxide per hectare, positioning hemp far above mature forest systems, absorbing two to six tonnes per hectare each year. Even younger forest stands that can approach eleven tonnes remain below the upper range recorded for hemp. This is supported by the rapid growth rate of the plant, which, in favourable Indian regions, reaches four metres within four months, and by the efficiency of its C3 photosynthetic pathway. As a fast-cycling crop, hemp can complete its carbon capture much more quickly than perennial tree systems. Hemp is also suitable for rain-fed hill regions. The cotton belts of central and northern India are dependent on groundwater extraction due to shallow-rooted cotton plants, which cannot access deeper moisture reserves. Hemp has an extended taproot system capable of drawing water from lower soil layers, therefore allowing plant survival during erratic monsoon patterns. This capability reduces crop loss risk during spells of dry weather and presents farmers in areas with plummeting groundwater levels and erratic rainfall with a more dependable alternative.

Cotton and paddy use high volumes of water and lead to aquifer depletion in Punjab, Haryana and Maharashtra. Cotton takes an estimated twenty-two thousand five hundred litres of water to yield a single kilogram of fibre in India. Hemp requires an estimated two thousand seven hundred nineteen litres per kilogram, which reduces water consumption by about eighty-eight per cent (Sark Engg, 2025). The overall water footprint of hemp is approximately sixty per cent lower than cotton, and crop irrigation requirements are about eighty four cent lower. Bamboo viscose requires between three hundred and five hundred litres per kilogram, although its processing involves chemical treatments, which hemp fibre processing doesn't depend on. Hemp fibre also reduces environmental damage in the textile manufacturing process. Compared to cotton, hemp requires fewer inputs in terms of water and pesticides, and yields lower greenhouse gas emissions per kilogram of fibre produced. The tensile strength of hemp textiles is very high, and products remain durable for a very long time, reducing waste. They are fully biodegradable and contribute nothing to microplastic pollution. Improvements in enzymatic and biological degumming have reduced water requirements for fibre processing and enhanced the quality of fibres. Bioethanol and biodiesel can also be produced from hemp biomass and seed oil, respectively. These fuels burn with fewer particulates and are near carbon-neutral because the crop absorbs carbon dioxide.

Cannabis sativa also plays a role in land rehabilitation under conditions of contamination. The plant acts as a hyperaccumulator and absorbs heavy metals like cadmium, nickel, lead, and zinc via its root system. The removal rates are as high as 50 per cent in cadmium and 90 per cent in lead in one season. This uptake is facilitated by transporter proteins in roots. Zinc tends to concentrate in roots, while lead and cadmium migrate into the stem and leaves. Wild Cannabis populations in several parts of India have exhibited enrichment coefficients greater than one, indicating metal concentrations in plant tissue higher than concentrations in the ambient soil. The ability to absorb contaminants has direct applications in industrial and mining regions. Related species like Humulus Lupulus and Stinging Nettle, grown in controlled water systems, have removed copper and iron with near complete efficiency, and hemp functions in a comparable manner. The crop was also planted around the Chornobyl exclusion zone to assist in the removal of radioisotopes from the soil. Similar applications are relevant for land near thermal power plants and uranium mining areas in India. In urban settings, roadside Cannabis plants take up pollutants associated with vehicular emissions and contribute to reducing the spread of heavy metals in surface soil along traffic corridors.

Hemp growing also enhances soil quality

due to its ability to store carbon. The lengthy taproot of the hemp plant secures the soil and averts landslides on steep hill slopes. This is highly helpful in the Himalayan areas, which experience frequent erosion and landslides. The rapid development of thick leaves will reduce the growth of weeds due to a lack of sunlight hitting the ground. It also reduces the need for herbicides and machinery in farming activities. Reducing soil disturbance maintains healthy microbes and sustains the soil in the long run. Hemp farms maintain their nutrients through moving them around rather than receiving them from the air. Crotalaria juncea is a commonly grown legume in Indian farms, which fixes 50 to 60 kg/ha of nitrogen in 60-90 days. The industrial hemp does not fix nitrogen but recovers lost nutrients from deeper soil layers. About 60 to 70 per cent of such nutrients are returned to the surface by the decomposition of leaves. Hemp is planted in rotation by farmers as it increases the soil quality, which results in a 10-20 per cent increase in the yield of subsequent crops.

Hemp also aids in the shift towards green industrial materials. Hempcrete is a product of hemp hurd with lime and water, and it stores the carbon that the plant absorbed during growth and absorbs more carbon dioxide as the lime hardens. A typical hempcrete wall traps 35kg of carbon dioxide per square meter in a period of a hundred years, and some of the storage value can be as high as 470kg per cubic meter. The indoor climate is readily maintained by hempcrete, hence reducing the energy demands in heating and cooling in the distant future.

05

RISKS, EXTERNALITIES, AND ETHICAL CHALLENGES

RISKS, EXTERNALITIES & ETHICAL CHALLENGES

HEALTH COSTS AND ADDICTION CONCERNS:

Using cannabis involves dangers for consumers, notably the onset of cannabis use disorder, which is marked by harmful usage patterns causing notable clinical impairment or distress. The drug impacts brain development, lowers inhibitions and weakens judgment, pushing people toward unlawful conduct. Research indicates a link between heightened cannabis misuse and a surge in occurrences of street harassment, gang violence, physical assaults and impulsive killings.

Initiating cannabis consumption in the adolescent years is especially harmful to mental capacities. A study carried out by Duke University in New Zealand (Meier, M.H., Smith, J., Johnson, K., & Brown, L., 2012) found that people who started marijuana use as adolescents and became chronically dependent suffered an average reduction of eight IQ points from age thirteen to thirty-eight. Importantly, those who quit marijuana use as adults did not regain the skills they had lost.

India is confronted with a precarious circumstance due to its large population at risk. The nation's youth display concerning patterns in the misuse of substances. The National Survey on Extent and Pattern of Substance Use in India, conducted by the Ministry of Social Justice and Empowerment aand released in 2019, disclosed figures: around 3.1 crore people (equating to 2.8% of the population) presently consume cannabis, and 72 lakh individuals (0.66%) suffer from cannabis-associated issues (Ambekar A, Agrawal A, Rao R, Mishra AK, Khandelwal SK, Chadda RK on behalf of the group of investigators for the National Survey on Extent and Pattern of Substance Use in India 2019. Magnitude of Substance Use in India. New Delhi: Ministry of Social Justice and Empowerment, Government of India).

The connection between cannabis use and psychosis has been examined across the era of cannabis. Notably, India was at the forefront in recording this occurrence. The earliest accounts of cannabis-related psychosis emerged from India, predating the 1894 Indian Hemp Drugs Commission Report. These initial findings were originally thought to be exclusive to India,

leading Ewen to label the condition as the " Indian hemp insanity" in 1904. Numerous decades have transpired in which research in psychology and psychiatry has linked various psychological factors to cannabis use and dependency and has recorded the harmful psychological and physical health impacts of the drug. The fifth edition of the Diagnostic and Statistical Manual of Mental Disorders recognises cannabis use disorder as a clinical diagnosis. Cannabis use disorder is when you take cannabis even if it causes psychological distress or physical problems. Besides, aside from craving it, people get addicted to cannabis, and you may become dependent on it. Cannabis abuse means taking cannabis somewhere where it is illegal to do so. Few studies have been conducted in the last few years on the treatment of various cannabis use disorders. Medicinal cannabis is a term that refers to distinct cannabis strains, and the compounds in cannabis are known to help in the treatment of substance dependence; on the other hand, some medical conditions and symptoms. Although scientific research on cannabis use is in its infancy. The study primarily examines the methods of intervention and therapy for the cannabis disorder. To discover successful methods or strategies for preventing, delaying, reducing and managing cannabis misuse and the development of dependence is the need of the hour. More specifically, in India, people with cannabis dependence form one of the sections of people coming to deaddictionand rehabilitation centres for treatment every year. The increasing need for treatment services underscores the gravity of the threat. A number of studies show that cannabis misuse and addiction in general were not the main reason people sought help at substance use centres. Most patients did not present with complaints related to cannabis when they began seeking treatment, but had issues linked to alcohol or opioid use. The patient was diagnosed with cannabis use disorder after initiation of treatment. In investigations, the greatest would be 13% of patients saying cannabis was the top cause for seeking help.

According to systematic reviews and meta-analyses in India, the patients consume and are dependent on tobacco, alcohol or opioids with cannabis. There is a significant lack of studies in India on healthcare costs from cannabis use. In comparison, thorough financial evaluations are available for drugs: Diseases related to tobacco incur expenses amounting to 1.04% of India's GDP, with direct healthcare costs accounting for 5.3% of the country’s overall medical expenditures. Alcohol consumption imposes a burden amounting to roughly 1.45% of GDP annually, with costs for treatment reaching INR 3127 billion. Exposure to secondhand tobacco smoke leads to economic expenses equivalent to 0.33% of India's GDP. (Oxford University Press study, economic costs of tobacco use in India, 2017-18)

Despite these available figures for other substances, comparable comprehensive economic burden analyses specifically focused on cannabis remain absent in India's research landscape.

PRODUCTIVITY LOSS AND WORKFORCE IMPLICATIONS:

Cannabis impacts cognitive and motor abilities critical to job performance. While under the influence, reaction speed decreases, focus becomes variable, short-term memory handles data less effectively and visual or spatial assessments may be altered. Such effects affect duties that require attention, precise coordination, or quick reactions. In environments that demand precise timing, clear perception, and constant vigilance, these unctions significantly impact the execution of tasks and the consistency of work outcomes. Certain people also undergo symptoms following the primary intoxication phase, including delayed task commencement, diminished alertness in the initial hours of a shift and challenges in structuring routines at the day's outset. These variations influence the speed of work initiation and the general flow during the segment of a shift. Testing methods do not directly align with these alterations. Conventional urine screenings identify metabolites that linger in the system after cognitive impacts have ceased. A positive outcome verifies usage but does not indicate if an employee is presently impaired. Someone might test positive for cannabis use days earlier, yet carry out tasks competently, whereas a recent user might go undetected by techniques that do not assess immediate cognitive function. This causes challenges in evaluating fitness for duty in settings where sharp judgment and focus are crucial.

Productivity fluctuates based on the cannabis use pattern and its frequency. Sporadic use during off-hours might not result in lasting performance changes for employees. Increased frequency of use is commonly linked to delayed task initiation, erratic focus and fluctuating productivity throughout the day. These alterations affect the speed, dependability and uniformity of task completion. In jobs demanding attention or continual analytical work, diminished concentration impacts both the work speed and the precision in managing details. Minor day-to-day variations build up gradually. Influence the scheduling of workflows, quality of service and operational consistency. When such trends happen in parts of the staff, other workers assume extra duties to ensure smooth functioning, altering how work is divided among groups.

Positions with safety responsibilities exhibit more evident impacts from these modifications. Tasks with machinery, vehicles, electrical components, elevated work areas or dangerous substances demand attention to the environment and rapid adjustment to evolving situations.

Reduced reaction times and changed perception in these environments heighten the risk of mistakes in operations. A postponed action or a mistaken reading of a signal might cause collisions between equipment, improper material handling or accidental control activations. Such results can cause harm, damage equipment or disrupt production processes. Certain events demand documentation, examination or subsequent actions impacting timelines and resource accessibility. Since these duties function within error tolerances, even slight changes in mental condition alter the risk factors. Such incidents frequently result in financial impacts. Expenses rise due to repairs, disrupted workflows and internal assessments. The time spent on recording and examining events detracts from the focus on tasks. Multiple occurrences might lead to intensified examination by auditors or regulatory bodies, thereby elevating administrative obligations. Employees who test positive for cannabis following incidents are reported to have many accidents, more injuries and increased absenteeism relative to those who test negative, demonstrating a clear link between cannabis consumption and workplace disturbances. Regular cannabis consumption also affects the way younger employees join and advance in the labour market. Young employees make up a portion of staffing in retail, hospitality, logistics and entry-level manufacturing, where consistent attendance, reliable focus . and rapid learning of routines are crucial When focus, preparedness or energy varies, the speed at which younger workers gain skills decreases. This lengthens training durations. Raises the time needed for workers to reach full productivity. When a significant portion of the workforce consists of individuals in the process of acquiring skills, slower development impacts staffing capabilities and increases training expenses for companies. Another aspect influencing human-capital advancement involves employment years. These initial years set habits regarding work discipline, learning pace and dependability. Should regular cannabis consumption diminish employees' regular engagement with routines, ability to be punctual or sustain attentiveness during shifts, the consequences reach past just the current work timeframe. Extended learning periods, delayed adjustment to settings and inconsistent productivity impact the overall developmental efficiency of the workforce.

In economies where productivity growth depends on workers steadily progressing into more complex roles, this type of drag delays the accumulation of experience and technical proficiency.

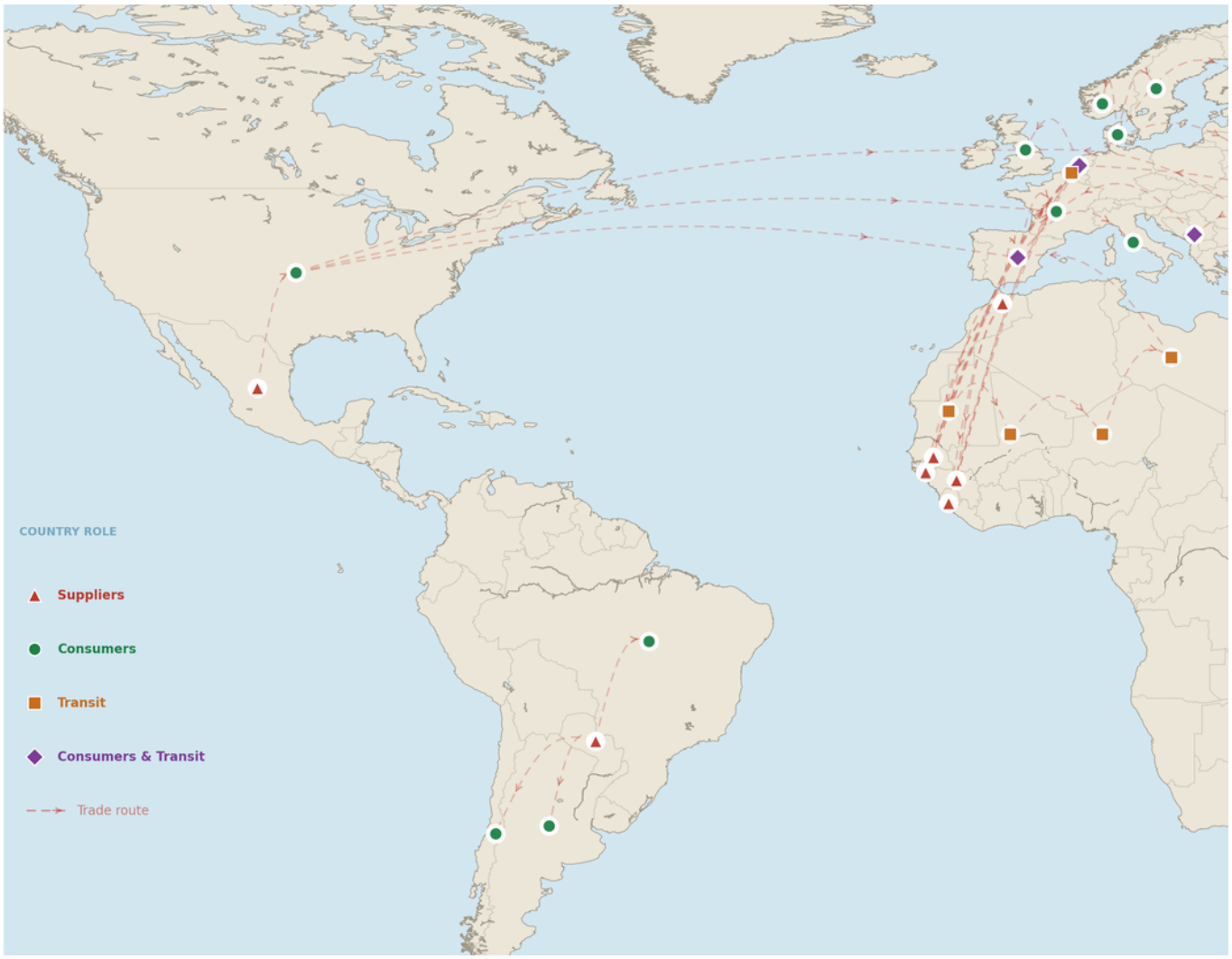
BLACK MARKETS AND ILLICIT TRADE RISKS:

A key reason supporting cannabis legalisation stems from the existence of cannabis markets. Because cannabis consumers and suppliers typically hide their identities and usage to evade repercussions, there is scarce statistical information about the cannabis black market. Nonetheless, despite the numerous hazards and risks these markets present, the risks to users cannot be overlooked.

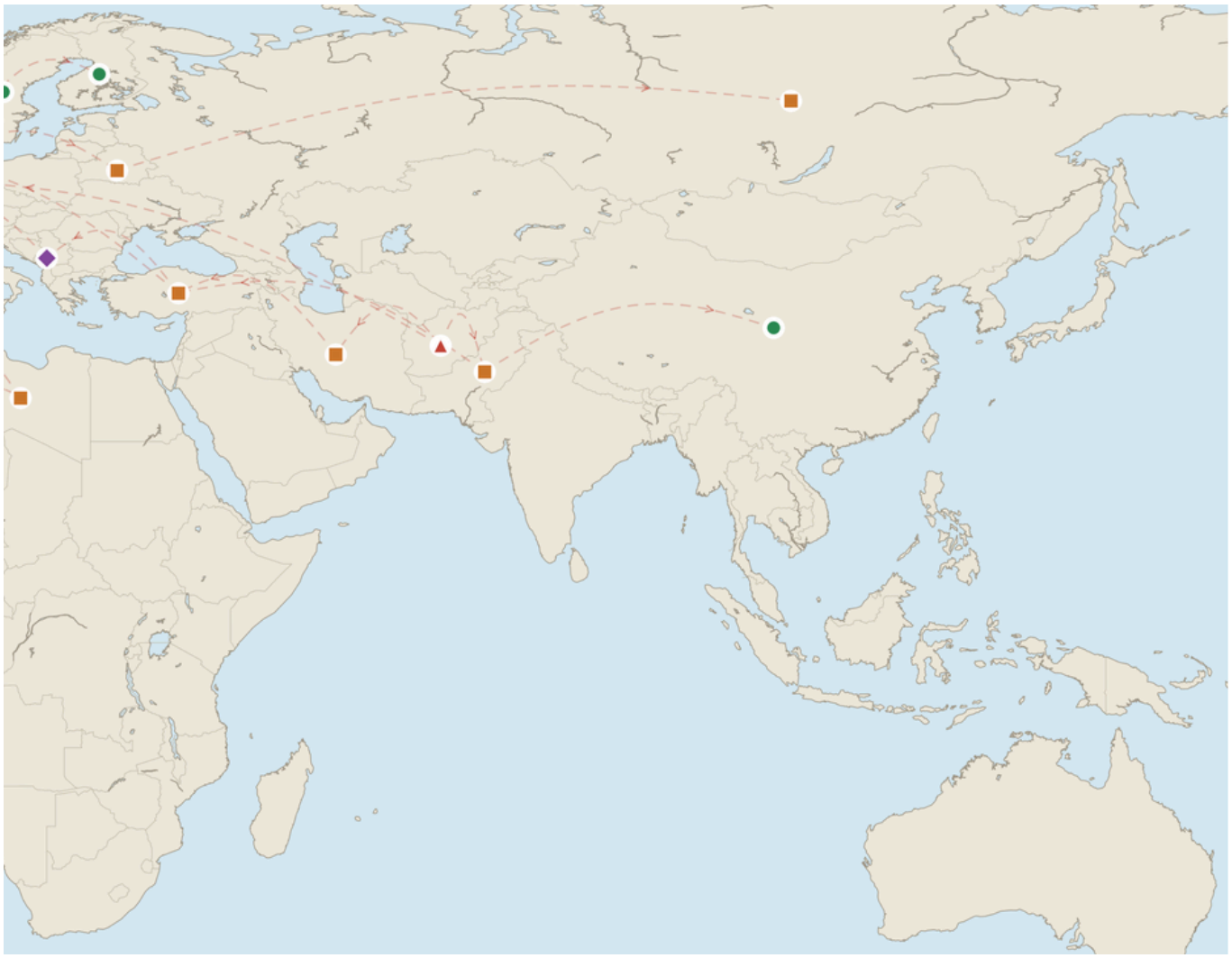
Medications distributed through illegal networks do not adhere to safety regulations or quality benchmarks set by authorities, endangering both producers and consumers. Due to the use of combustible chemicals in manufacturing, explosions can happen at the production locations. Moreover, the presence of contaminants or foreign substances in cannabis heightens health dangers for users. Cannabis available on the market carries steep costs, potentially driving those dependent on it to engage in street crime and theft to pay for it. An additional danger involves the encouragement of violence and intimidation because of the character of the trade. As no lawful contracts or agreements can be formed among sellers or between sellers and buyers, they might turn to violence and threats to increase their market control and remove rivals. This violence can also affect people nearby, creating fear and causing victimisation, in regions where drug markets exist. During prohibition, although law enforcement typically prosecutes less coordinated sellers, bigger and more structured criminal groups see it as a business prospect. As a result, the police inadvertently diminish competition for these groups, which might channel the profits from cannabis sales into financing other illegal and violent operations.

The distribution of cannabis alongside hard substances such as cocaine and heroin might not occur independently within the illicit market. Marketing strategies used by cannabis sellers could lead consumers to be introduced to hard drugs that carry far more serious consequences.

Eliminating corruption would have a significant impact on the different illegal organisations and criminal networks. Illegal cannabis trafficking groups depend on bribing officials and staff in various sectors to facilitate their operations. These networks aim to bribe customs officers, port authorities, harbour security staff, dockworkers, and IT administrators at ports, airport workers, employees at private aviation firms, transportation company drivers and other key personnel to guarantee their cannabis consignments arrive at their designated destinations.



Moreover, police officers, prosecuting lawyers and staff at institutions are often targeted for bribery to gain information on active investigations or to influence law enforcement activities. Criminal organisations also offer bribes to government representatives, property owners (whether residential, agricultural or commercial) and real estate agents to locate, gain entry to or retain control over sites ideal for cultivating or storing cannabis. organisations include those functioning domestically and those engaged in drug trafficking spanning nations. Reports indicate that Albanian and Serbian groups have established a presence in markets (European Monitoring Centre for Drugs and Drug Addiction, n.d.). Entities from countries producing cannabis are also significantly active in the cannabis market in Europe, either partnering with groups or operating independently. In Oceania, New Zealand and Australia have been home to cannabis cultivation for a long time and are hotspots for illicit cultivation, especially by criminal groups involved in the cannabis trade. Cannabis has a presence functioning across Europe, Asia, Africa and the



Americas. Within the US, Chinese criminal groups are emerging as figures in the cannabis market. Oklahoma has developed into one of the leading illicit cannabis producers. In Latin America, Mexico is a cannabis producer, with Mexican cartels involved in the cross-border trafficking of illegal cannabis and other narcotics. Cannabis sector criminal groups often work together, particularly among large-scale distributors. They combine assets, establish alliances and trade services to advance their activities. This collaboration involves organising deliveries, strengthening control over markets and creating alliances in times of disputes. Numerous cannabis trafficking networks are concurrently involved in drug sectors. Their activities often consist of transporting drugs, simultaneously mixing cannabis consignments with heroin or cocaine, for example. At the level of distribution, these groups regularly participate in drug-for-drug trades, exchanging cannabis for heroin or cocaine through barter deals.

SOCIAL AND ETHICAL CONCERNS:

Legalisation normalises cannabis, which may induce people, especially the youth, teenagers, and college students, to start consuming it more often, as it is available more easily now. And a nation needs to keep the youth away from such illicit substances, as they are at the most risk by consuming cannabis because their brain still develops till the age of 25, hampering the part of the brain that controls planning, judgment and decision making.

A common pattern can be seen in the youth regarding the factors that induce them to turn to cannabis consumption. They might wish to try it early due to peer pressure, curiosity, online influence, academic stress, personal life problems, or seeing celebrities and their role models use it. Regular use leads to dependence, the body starts demanding and makes its intake "normal". Eventually, the dosage and frequency increase. They lose productivity and require medical care, resulting in a significant loss to the process of human capital formation, especially for a country like India, which has the largest youth population in the world. We are very well aware of the physical side effects of intake of cannabis such as increased heart rate, slower coordination, bloodshot eyes, increased appetite, etc however most of these are treatable; unlike the other counterpart, i.e., side effects to the mental health, which is more concerning because one, many people don't talk and reveal anything about it publicly to anyone, two, it is comparatively difficult to treat. Some of the examples of side effects include:

- Difficulty in focusing
- Short-term memory problems
- Increased panic or anxiety attacks
- Higher risk of psychosis

Not everyone in society gets affected equally.

- Families already struggling with unemployment or debt may suffer more if a member becomes dependent.
- Low-income areas have less access to mental health services, rehabilitation centres, and awareness programs.
- Addiction can worsen unemployment, indebtedness, and household instability, further leading to more issues; intergenerational effects can be seen where children may face emotional, academic, or financial strain due to substance dependence at home.
- When cannabis is legalised, on the supply side, the market becomes more formal, where legal paperwork, licensing, more investment and legal compliance come into play.
- Because of these entry barriers, poorer farmers and small community businesses struggle to enter the formal market even though they may have been cultivating hemp for generations. This induces the traditional cultivators to turn into labourers & profits go upwards, making the richer section richer

Legalisation gives rise to new public safety and social order responsibilities for various domains like road safety, workplace safety, law enforcement challenges and healthcare burden. India already has high road fatalities, and this may worsen it as driving after consuming cannabis slows reaction time, leading to a higher number of accidents.

This also facilitates various workplace issues as well; many "scholars" give unreasonable justifications that cannabis consumption can increase productivity, but this applies to the very short term, which is negligible in the overall sense. In the long run, this leads to mistakes, miscommunication, poor operational

decisions, etc. This is more dangerous in the case of manufacturing plants, where workers need to be very active and careful with heavy tools and machinery; slower reaction time when indulging in the use of substances could lead to fatal accidents.

Apart from the above two, the most common and direct hit will be on law and order in contemporary society. Nuisance in neighbourhoods would become common as legal availability may lead to more people smoking in parks, markets, bus stops, or housing societies, and the strong smell, noise,

and gathering of groups may make nearby residents uncomfortable. Families would start to feel that public spaces have become less safe for children. Criminal networks might get weakened; however, it is very probable that for a commodity like cannabis, the scale of black marketing would rise to evade government taxes.

A tourism-centric model was adopted by the Netherlands, where, though possession of drugs is illegal, possession in small quantities is tolerated and not prosecuted, and these are sold only at licensed "coffee shops" under strict conditions. This may not work in Indian society, where people perceive the use of drugs as highly immoral, and a similar model leads to neighbourhood disturbances and backlash from different families due to fear of deterioration in the quality of the social environment.

Therefore, all these points of view raise

many strong ethical questions for policymakers:

- Freedom vs protection debate: Should adults freely choose substances, or should the state restrict such harmful behaviour?
- Revenue vs responsibility: Is it ethical for governments to earn tax money from commodities that are injurious to the public's health and society's welfare?
- Moral hazard: If cannabis use becomes normalised, will society undervalue discipline, well-being, or productivity?
- Market Inequality: Policies may benefit wealthy entrepreneurs but harm small and marginalised groups dealing in the same business. How do you rectify that?

RISK MITIGATION STRATEGIES:

The previous sections have discussed the risks and costs associated with cannabis in detail. However, there exist many strategies for intervention and mitigation of many of these risks, which are being carried out in the countries where cannabis is legalised. Furthermore, several reports suggest other effective measures to control the risks associated with cannabis consumption. One study emphasises the use of Lower Risk Cannabis Use Guidelines (LRCUG) as a control measure to cannabis consumption (Fischer, B., Russell, C., Sabioni, P., van den Brink, W., Le Foll, B., Hall, W., Rehm, J., & Room, R., 2017). A key recommendation of this study strongly discourages early onset of cannabis consumption(before 18 years of age), as there exists strong evidence correlating damage to brain development and early onset of cannabis use.

Use of cannabis products with higher THC content, inhalation of combusted cannabis material, practices like 'deep inhalation' which involves breath holding for better absorption of psychoactive ingredients and the use of cannabis products by pregnant women and individuals with a family history of psychosis and substance use disorders is also discouraged as precautionary measures to minimise adverse health effects.

Synthetic cannabinoids are lab-made chemicals designed to replicate the effects of the chemicals present in the cannabis plant for narcotic purposes. However, the effects of these chemicals are said to be stronger, more dangerous and unpredictable than the THC found in cannabis plants. These chemicals are engineered to impact the cannabinoid receptors in our body with greater potency than natural THC, increasing its risk, due to which its use is also discouraged. However, out of all the recommendations, the most effective one is abstinence. Any use of cannabis can lead to several acute and long-term health effects, depending on the usage pattern, product and genetic disposition, and the best way to prevent these side effects is to abstain from using such products.

One important method of control is educational campaigns, which are public health initiatives to educate citizens about cannabis laws, safety guidelines and the health effects of cannabis. One study aimed to evaluate the effectiveness of such campaigns by assessing the performance of an educational campaign undertaken in Massachusetts in 2018 after cannabis was legalised there (King County Department of Community and Human Services, 2020). The campaign ran on several media outlets, including animated videos, ads on social media websites, brochures,
ut-of-Home ads, merchandise and the development of a dedicated website. The purpose of the campaign was to inform potential users about the rules on cannabis consumption, educate parents about its risks, and provide ways for them to communicate with their children about such issues. The campaign was evaluated on several metrics, which were categorised into- Reach, Recognition and Knowledge. The reach metrics assessed the campaign on the basis of clicks, views, cost per click and cost per completed view on several different social media platforms. The recognition metric aimed to assess the staying power of the campaigns, frequency of exposure to the different images, brochures and videos spread during the campaign and if the public is able to connect the various media to the campaign and the intended objectives. The knowledge metric assessed the effectiveness with which the various information regarding the cannabis rules, ihealth effects, penalties and exceptions is conveyed to and retained by the public.

The assessment provided favourable results for the continuation of such public health awareness programs. It reported higher odds among the people who were surveyed post the campaign to report cannabis use among individuals less than 21 years of age, as compared to the people who were surveyed before the campaign. Similarly, higher odds were reported for people being aware of the increased risk of cannabis consumption while driving, the importance of keeping cannabis in locked storage areas and the risks of consumption by the youth.

Another study emphasises the importance of the statutory warnings on cannabis products. These warnings can be an effective way to convey the risks and threats associated with cannabis consumption in those states where cannabis has been legalised (Transform Drug Policy Foundation, 2022). However, it is important that the government uses this medium of communication effectively. For example, it is noted that in the US, the warnings are placed on the back of the packaging of products with small, hard-to-read texts with long content, which makes them unattractive and essentially ineffective. Furthermore, these warnings are not consistent and may lead to confusion about the health risks. This is in contrast to the flashy and attractive warnings used by cannabis producers, which highlight the

benefits of cannabis consumption and thus promote its use. Such warnings should be large, visible and include images to convey better the intensity and severity of the potential side effects of consumption.

Statutory warnings should be able to educate and advise consumers, draw more attention by focusing on design and provide an evidence-backed message regarding the risks. Taxes on cannabis are not just a measure to increase government revenue but also one to control the consumption of the quantity of cannabis consumed. As taxes directly raise the price of cannabis, it discourages the production and consumption of cannabis use thus reducing the quantity consumed. However, there is a need to evaluate the effectiveness of tax policies in regulating cannabis consumption.

As mentioned in previous sections, tax can be imposed on price, weight or potency (measured
n terms of THC content) of the cannabis product. In general, it is believed imposition of tax based on the potency of cannabis is more effective for improving public health than the other two methods. This is because it would discourage the use of high-potency products and incentivise the use of low-potency products, which have significantly lower health risks.

Another argument for a potency-based tax regime was that post-legalisation, the price of cannabis may fall over time due to lower legal risks, which would further increase efficiency, because taxes imposed based on weight or price would lead to a drop in government revenue (Washington State Liquor and Cannabis Board, 2020). Therefore, to protect the government from such a fall in revenue, potency-based taxes were thought to be a better option as taxes would be imposed on the THC content, which was expected to remain stable or even increase with the emergence of more potent products. However, in Washington State, for example, it was noted that the fall in price was compensated by a rise in demand for cannabis products, due to which this argument lost relevance.

Price-based taxes, however, can also be used to tax higher potency products as they tend to have higher prices, thus attracting more tax; however, as mentioned in previous sections, they are difficult to apply to vertically integrated industries.

Another major concern regarding taxation is that it might force the price-sensitive groups, such as lower-income communities and the youth, to resort to black markets or illicit
channels for lower prices. Taxes will lead to an increase in the price of cannabis products, which may push these communities out of the legal markets. Since illicit channels involve higher risks of disease transmission and adulterated products, they put these sections at greater

risk.

A major reason to tax cannabis is to cover the social cost that its consumption creates due to the public health risks; however, medicinal marijuana is said not to produce such negative externalities. Therefore, tax policies for recreational and medicinal cannabis should be different, though the distinction is hard to implement.

A major concern is to minimise teenage consumption of narcotics like cannabis. Prohibitionary policies failed to do so as cannabis was readily available to this age group via black market or teen-to-teen sales, thus defeating a major purpose of the entire program. Under a legalised market, it would be easier to put controls on both consumers and producers and thus, excluding certain age groups from this market would be feasible, as in the case of alcohol and tobacco. Since under prohibition, prices of cannabis were high in the black markets, teenagers had the profit incentive to partake in teen-to-teen sales; however, this problem can be eliminated as prices can be regulated in a legalised market. Thus, by restricting the sale of cannabis and eliminating involvement of teenagers in the cannabis market, the government would be able to impact teenage consumption better in a legalised market than under prohibition.

Other general controls that the government can impose could be on the retail outlets of cannabis products- their locations, working hours and stock sold. Further controls on the advertising and marketing of cannabis products, like those imposed on alcohol and tobacco, can be imposed. Ensuring proper tracking, monitoring and auditing of producers is essential to gauge the compliance with rules and regulations by companies and to prevent any flow of cannabis products in the black market.

Since cannabis is a new product making its way into a legalised sector after years of prohibition, there may be greater regulatory controls on it, as compared to tobacco and alcohol. This is because lawmakers would be more cautious with the cultural shift in the way cannabis is being viewed in the markets. However, any regulatory measure should be taken with proper evidence and not due to social stigma or unsubstantiated assumptions. This can be seen with the presence of stricter controls on cannabis in Canada and Uruguay as compared to alcohol and tobacco, which may risk preferring such substances among the youth and dismissing the severity of their effects. One study claims stricter controls on cannabis, which are evidence-based, can be used to demonstrate the best practices for drug control. In a way, it might reveal the inadequacies in the alcohol and tobacco policies, thus facilitating improvements in such policies.

06

INTERNATIONAL POLICY LANDSCAPE

INTERNATIONAL POLICY LANDSCAPE

GLOBAL CANNABIS POLICY OVERVIEW

The regulation of cannabis is vastly different country by country, and the laws are not very unified, either in terms of broadening medical access or enforcement of prohibition. The international drug control architecture built on the 1961 Single Convention on Narcotic Drugs imposes strict control against medical and scientific uses of cannabis. The existing national laws allowing non-medical use don't meet the provisions of the treaty. Some medical systems allowed prescribing through simplified processes for greater consumer access, but were far from the clinical governance required by Article 4 of the Convention. UN Commission on Narcotic Drugs (CND) removed cannabis from the Schedule IV list, but it was still kept on the Schedule I list. Its exclusion from that list of substances that lack therapeutic value gave governments more leeway to expand medical operations.

REGIONAL POLICY LANDSCAPE

EUROPE

Germany's reform is the most significant policy development in Europe during this period. According to the Cannabis Act (CanG), individuals may possess up to 25 grams of cannabis in public and up to 50 grams at home (KCanG, 2024). Home cultivation of up to three plants is allowed, and non-commercial cannabis clubs of up to 500 members are allowed to dispense cannabis. Pilot commercial supply programs are in the works. Germany is the biggest medical cannabis market in Europe. Import volumes were 32.5 tonnes in 2023 and rose to 71.6 tonnes in 2024 following the implementation of the CanG Act (Cannabis Industry Data, 2024). Germany

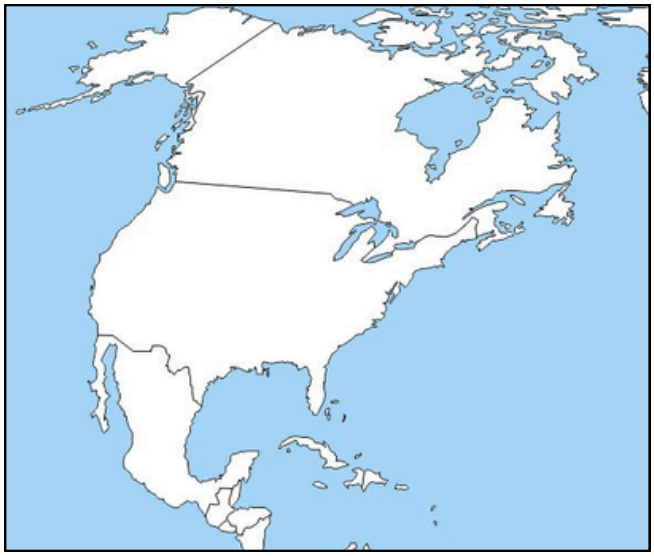
imports medical marijuana mainly from Canada, and Portugal is a source of major source of EU GMP-compliant medical cannabis through which Canadian imports pass (MJBizDaily, 2024) (Stevens, 2025). Switzerland has continued with its structured pilot studies for regulated access in the system. The Zurich project has raised participation and continues to produce information on consumption trends at controlled dispensation, and is able to produce data on demand while in a controlled manner. Portugal is still one of Europe's biggest producers and exporters. Regulations in 2025 impose requirements for EU GMP certification in cultivation, processing and distribution, forcing operators operating in Portugal to significantly raise their standards of compliance.

UNITED STATES OF AMERICA

In the United States, the expected federal rescheduling of cannabis stalled in early 2025 when the Drug Enforcement Administration decided to postpone a hearing on this proposed change in its scheduling from Schedule I to Schedule III. Consequently, the resulting tax burdens imposed by Section 280E still exist and limit a business's financial viability, just because they are state-regulated. This also affects the regulatory framework and quality of cannabis products that are legal and affordable.

LATIN AMERICA

Colombia still maintains its high export-oriented industry. Following the allowance of dried flower exports in 2021, the country announced export revenues of 10.8 million dollars in 202. Although Colombia’s overall production



costs are low, EU GMP compliance is needed to enter valuable European markets, raising operational and financial barriers to entry, which have been a challenge for producers. Uruguay had a continuous export profile with 2023 shipments of around 25 tonnes of biomass. At home, pharmacies are selling THC-containing products to facilitate the legal market and lessen exposure to criminal supply routes.

ASIA PACIFIC

Thailand moved towards more permissive regulation by introducing measures in 2025 to classify cannabis flower as a controlled herb and require medical prescriptions for any purchase. Such rules restrict consumer access to cannabis and put many retail outlets in danger. Australia is making medical cannabis more accessible through the Special Access Scheme. In 2024, almost one million medical cannabis prescriptions were issued, driven by increased practitioner familiarity and demand for alternative forms of therapy. Advocates for non-medical legalisation have not yet advanced, suggesting that it is the medical framework that will remain the primary vehicle for regulated access.

ECONOMIC AND FISCAL MODELS

AD VALOREM SYSTEMS

As a percentage of retail value, most U.S. jurisdictions impose ad valorem taxes. These measures allow market fluctuations and have resulted in significant tax revenue. Between 2014 and 2024, state legal markets collectively generated almost 25 billion dollars in adult-use tax revenue. The model enables regulated products to maintain competitiveness in periods of price squeeze because the tax risk decreases with falling retail prices.

FLAT RATE SYSTEM

In Canada, this excise duty is followed; it is levied at one dollar per gram. With the decrease in wholesale prices, this duty has been a big portion of the total cost and has put pressure on licensed producers. In narrow market segments with tight margins, the duty constrains legal goods from competing with unlicensed alternatives. The structure also constrains the ability to market a low-cost product without putting the industry on a financial stretch.

VAT-BASED SYSTEM

Germany has a value-added tax system for medical cannabis. This makes it affordable compared to the illicit supply of legal products and facilitates the entry of patients into the regulated medical market. This approach shows how fiscal design can impact participation rates and reduce dependence on unregulated channels.

Comparative Analysis: USA, Canada, EU, Uruguay:

Cannabis policy globally has evolved through a diverse mixture of public health concerns, criminal law reforms, economic incentives and various ideologies. The regulatory frameworks of the USA, Canada, the European Union (EU) and Uruguay represent four distinct pathways in the global policymaking dimension. Each model is unique in its own way, and each of them offers insights into the impact of legalisation on market structure, taxation, law enforcement, consumer behaviour, etc. Below is an in-depth and highly insightful comparative analysis:

USA

The United States has a dual sovereignty political system, where federal and state laws possess independent powers. Under federal law, cannabis is classified as a Schedule I substance under the Controlled Substances Act (CSA,1970), meaning "no accepted medical use and high potential for abuse", while over 39 states have legalised medical cannabis and 24+ states have legalised cannabis for recreational purposes. This results in a policy contradiction, as inferred above, a multi-billion-dollar industry exists that is illegal under federal law. Policy framework and its enforcement across state and federal laws vary widely. States control licensing, production caps, supply-chain regulations, THC limits, packaging standards, advertising restrictions, and taxation. Many of them have decriminalised possession, and some of them have imposed strict penalties. Illegality under federal law restricts interstate commerce, banking access, insurance, and research funding, forcing the industry to rely on cash transactions. US states follow a commercial and competition-based model, which allows private companies to cultivate, process and market cannabis. Product diversification is high, edibles, vaping, tinctures, concentrates, tropicals and high potency flowers. The California example is a distinct situation where heavy taxes in the state have created an illegal market that competes with legal businesses. Federal and state laws contradict, but in all, on a vague picture, they share one or two similarities. Wherever cannabis is termed legal, there is a strict 21+ age requirement; the enterprises must add warning labels, child-proof packaging, a ban on advertisements, etc. And the revenue that comes from the taxation is channelled into funding for anti-addiction programs.

CANADA: PUBLIC-HEALTH CENTRIC MODEL

Canada became the second country in the world in 2018 to fully legalise cannabis nationwide. The Cannabis Act, 2018, was passed, which governed various dimensions like production, distribution, sale and possession. Referring to the division of powers, the federal government looks over

cultivation, quality standards, testing, packaging, and advertising regulations, while the provinces decide retail models, number of stores, age limits, and distribution channels. Canada uses a government-regulated supply chain, where producers should have a license, and they have to meet strict requirements for pesticide control, potency testing, lab certifications, seed-to-sale packaging, plain packaging and THC visibility and warnings. Marketing and branding restrictions in Canada are among the strictest in the world, similar to cigarette regulations. When we talk about market structure, retail varies by province, as there are government-run stores in some provinces, private-operated stores in others, and we could also see hybrid systems in some provinces as well. Due to high compliance costs, the industry is dominated by big corporate players. Canada's legal cannabis market is valued at USD 5-7 billion annually (Research and Markets,2025). The goal is harm reduction and not commercial expansion. Extensive public awareness campaigns on youth usage are present, and strict implementation of limits on the potency of the product and edible packaging. Only labs approved by Health Canada can rectify batches; regulations include plain packaging with no pictures and shades of colours to discourage youth appeal and prevent aggressive marketing, a key distinction from the US model. Advertisements are almost completely banned, and only informational and non-appealing advertisements are allowed. Canada permits special forms of cannabis, but under tight control.

Unlike the US model, the policy framework adopted in Canada eliminates the confusion and conflicts between federal and provincial legislation. These policies have a great affinity for public health and aim to mitigate the harmful effects by preventing aggressive marketing, controlling youth exposure and enforcing product safety. But the laws, from another perspective, for instance, can prove to be very stringent. Again, high compliance costs do not act as facilitators for small enterprises and obviously lead to illegal markets. The weakness and the negative aspects in all are the same, even for Canada. Canada is the first G7 country to legalise cannabis. Its cannabis policy framework is much more than legalisation. It combines public health, criminal justice reform and economic development. When we study Canada's cannabis policy framework, we see how the legal cannabis market and fast-maturing framework develop over time. Most importantly, Canada's experience tells us one thing. Stringent regulations slow down growth but improve safety.

EUROPEAN UNION

The European Union (EU) does not have a cannabis law of its own, but rather a multi-layered cannabis ecosystem where the

member states have each adopted their own cannabis policy, but under a common legal framework. Consequently, Europe contains the most polychromatic spectrum of cannabis regulations anywhere in the world. It ranges from prohibitive to partial tolerance to full medicalisation. As previously mentioned above, the EU does not have a drug policy of its own. Member states are left to decide on their own drug policy. The focus is on coordination, trafficking drugs, cross-border crime and public health data. The European Union's member states subscribe to two crucial UN treaties. They are the Single Convention on Narcotic Drugs, 1961 and the Convention on Psychotropic Substances, 1971. These treaties hinder cannabis' recreational uses, so states mostly rely on pilot programs, tolerated use and scientific research exemptions. Countries and actions taken by the EU are majorly:

"The Coffee Shop" Model of the Netherlands is one of them. In Dutch legislation, the sale of cannabis may be allowed under certain conditions, even though production and wholesale distribution remain illegal in the Netherlands. It's a system commonly referred to as the coffeeshop system, where licensed outlets will sell small amounts of cannabis to adults subject to strict rules on advertising, public order, and maximum possession limits. Individual possession up to five grams is tolerated, and coffeeshops may keep limited quantities on the premises, but cultivation and supplying to these outlets still fall under criminal law. This leads to a kind of so-called "backdoor problem," in which retail sales come under regulation even as upstream supply continues to be unlawful. Despite this disjunction, the coffeeshop model has been in place for decades and works as a type of regulated retail environment used to keep cannabis out of markets for other illegal substances. Recent pilot projects in several Dutch municipalities (Government of the Netherlands, 2022, Cannabis Pilot Projects to regulate legal cultivation) have tried to regulate cultivation for coffeeshops via authorised growers as a substitute for the informal supply chain, although national implementation has taken time.

Malta was the first European country to legalise cannabis.

Germany moved towards a hybrid recreational framework called "Cannabis Clubs". Cannabis clubs in Germany are non-profit, member-based cooperatives that grow and share cannabis among their registered members. These clubs operate on a closed, non-profit model, unlike for-profit dispensaries that are open to the public, and are a part of the broader discussion and framework for legalising cannabis in Germany.

Countries like France, Poland and Sweden, however, believe in a stricter counterpart of the policy landscape. They have the strictest

laws, and drug use is criminalised; medical cannabis is accessible only after pilot programs. Zero tolerance is the nature of the policies; however, on the contrary, these countries are the highest cannabis users in the EU.

The Czech Republic, Portugal and Spain are the countries that have adopted models which are seen as exemplary on a global level. These countries have decriminalised cannabis a long time back; however, their focus remains on harm reduction and treatment over punishment. Medical cannabis is totally legalised. In this framework, not perfect, but by far seems most prudent, as it focuses on the idea: Not fully legal, not fully illegal. A pragmatic harm-reduction approach with medical access and movement toward regulated recreational markets.

But challenges are spread across the whole EU. There is no single EU law, leading to complex and fragmented markets. Since all EU members have to adhere to international treaties mentioned while framing their policies, this leads to a delay in the policy-making process. There are still loopholes not only in the EU guidelines but also in the policies of the member nations. As we know, cannabis clubs are an important component of most of the policies of most EU countries, but still, grey and illegal markets exist even after impeccable models in the case of the Czech Republic, Spain and Portugal.

URUGUAY: THE WORLD'S FIRST FULLY LEGAL CANNABIS FRAMEWORK

Uruguay is the first country on Earth to completely legalise cannabis for recreational use under a government-controlled, public-health-first model. Uruguay's model was built on public safety and not to serve commercial interests. President José Mujica's government legalised cannabis to:

- Reduce drug trafficking
- Prevent youth involvement
- Replace the illegal market
- Treat drug use as a social and health issue, not a criminal one
- Avoid the commercial excesses of US-style markets

Uruguay's policy framework is unique in the world and uses a three-channel legal access model:

CHANNEL-1: PHARMACY SALES (STATE-REGULATED RETAIL)

This is the most controlled channel. The government has central authority over this channel, deciding price, THC levels, distribution, etc. Cannabis is grown only by government-licensed private companies, and all cannabis is monitored under a seed-to-sale tracking system administered by the Institute for the Regulation and Control of Cannabis (IRCCA). Only registered citizens or residents (18+) can buy, and foreigners and tourists are excluded from this channel

to prevent “cannabis tourism”.

CHANNEL-2: HOME CULTIVATION (SELF-SUPPLY SYSTEM)

This is the channel targeted at people who prefer personal autonomy, not purchasing through the state-controlled system. There are some rules set by the government on the cultivation of cannabis in the personal vicinity. Any resident of Uruguay (18+) can register with IRCCA to grow cannabis at home. Up to 6 flowering plants per household and maximum annual yield should not be more than 480 grams; they must be grown inside the home or private property, not visible from public spaces.
The purpose of this channel is to empower citizens who want safe and organic produce and avoid illegal markets, per se. However, the cultivation of cannabis requires proper space, knowledge and resources, which most people lack, and if seen on a realistic lens, 480 grams is a very low limit, and the encroaching of this limit is inevitable and unnoticeable on a macro level.

CHANNEL 3: CANNABIS CLUBS(COLLECTIVE CULTIVATION MODEL)

This is Uruguay’s most innovative and influential channel, and can be compared to Spain’s social clubs (the first country to introduce this idea); however, Uruguay applied much stronger regulation to it. These are more or less explained in the previous policy framework of Germany.

Here, membership was capped at 15 to 45 adult members. The club registers with IRCCA, submitting cultivation plans, locational details, member list, etc, and clubs cultivate collectively, not individually. This gives higher product diversity than pharmacies; members build connections and share knowledge, and it is totally non-commercial, which reduces industry risks. Uruguay’s system is the first government-designed, top-down legalisation model in the world. Unlike the US and Canada, Uruguay deliberately rejected commercialisation, with no large corporations dominating and having an aggressive profit motive.

In the limitations section, we can add that Uruguay completely lost its tourism opportunity, which discouraged large commercial investors from investing, limited product biodiversity was present, and the

government slowed innovation. However, welfare economists argue that positive effects outweigh the negative ones as Uruguay neglected economic development and chose welfare and citizens’ development over the former, and the previous statement is self-explanatory regarding the explanation of the effectiveness of Uruguay’s policy model.

PROGRESSIVE MODELS

In multiple regions, cannabis regulations are expanding, and policy models created by different governments reflect their public health priorities, economic expectations, and enforcement capacity. For instance, some jurisdictions depend on tight state control over supply, while others license private operators accountable to regulatory oversight. The general character of a regulatory system is shaped by factors including rules for home cultivation, packaging standards, laboratory testing and age controls.

Some jurisdictions have a state scheme in which the government administers the distribution or retailing of cannabis. This model seeks to keep control on accessibility very close, reduce commercial ownership and keep profit motives quite distinct. Quebec and Uruguay are the best examples of these models. Quebec runs the Société québécoise du cannabis, the sole retailer of non-medical cannabis. The organisation is required to minimise illicit market activity and have a public health focus. Its retail network does not run on commercial branding, and product categories thought attractive to youthful generations are not allowed, such as certain edibles or flavoured vapes.

Uruguay's method restricts cannabis supply to pharmacies. After signing up for membership in the national system, citizens and residents can buy regulated cannabis. Sales are capped to prevent heavy consumption. Despite its policy of not widely commercialising cannabis, Uruguay has been faced with supply shortages and limited variety (Rychert et al., 2025), and this development has meant that informal distribution continues. Despite these constraints by being less than conventional marketable, the program provides a rational alternative to commercial markets that maintains a strong emphasis on eliminating harms associated with the illegal trade.

The federal regulatory framework of Canada makes private producers eligible but requires that some provinces maintain strict control over production standards, licensing, inspections and distribution. Export development was aided by the national approach. Medical marijuana exports for the fiscal year 2023 to 2024 were CAD 218 million (Financial Post, 2025). High export activity owes its origins to Canada's early development of good manufacturing practices, high laboratory testing standards and rational licensing for products, which will attract consumers into Canada, including imports from Germany. The state controls aggressive marketing, reduces product diversification that would appeal to underage users and centralises oversight. But it could struggle to keep a robust source of different products at levels users expect. Users may continue getting cannabis from unregulated sources if legal methods fail to offer adequate selection. Achieving a desirable balance to minimise access while maintaining a functioning legal

market presents another perennial problem facing state-run systems.

Several jurisdictions use licensed commercial retail models in which privately owned retail and businesses are regulated under a license. The state agency-backed environment in these jurisdictions promotes competition, provides customers with choice, and includes variety and availability; the states implement compliance and safety regulations. Alberta represents a highly accessible commercial model. The province already has the highest retail density in Canada at around 20.4 shops per 100,000 people (Health Canada, 2024). Legal outlets have reduced illegal buying, but the pressure on retailers has led to market saturation as well as falling margins. Retail competition has led to compression in prices and discounting tactics. Commercial markets in the United States, for example, mature over time in Colorado and California. Colorado's marijuana tax revenues, which had developed rapidly post-legalisation, plunged to a seven-year low in 2024, brought about by a drop in wholesale prices and increased competition. Newly legal states, including Missouri, saw a rapid growth of the market shortly after implementing regulated sales. The differences demonstrate that commercial markets undergo stages, in the early expansion phase, followed by stabilisation and consolidation stages. Some jurisdictions try to include social equity objectives in licensing. New York and Illinois, for example, have put applicants in communities with more of an impact from enforcement during the prohibition era first.

These initiatives seek to develop and promote economic activity for groups long excluded from the regulated economy. But small operators often find it hard to penetrate or to stay in the market due to high operating costs, capital-intensive requirements and regulatory compliance. The result is uneven implementation, as it is in policy but difficult to realise in practice for equity objectives. The commercial systems bring diversity to the product range, not typically available in state systems. Edibles, concentrates, vapes and specialised flower cultivars also form consumer product segments that respond to innovation. This diversity can deter users from unregulated sources while driving increased consumption among certain groups when product strength or attraction expands too quickly. Home cultivation offers alternative routes to commercial and state commerce for individuals. It is pitched as a matter of personal liberty and a means to curtail illicit suppliers. Germany's Cannabis Act, effective April 2024, allows adults to grow up to three plants for personal use. This is positioned as a transitional solution that provides instant access to legality and allows the commercial pilot programs to be started. The legalisation of home cultivation decreases the pressure on consumers to turn to unsanctioned markets and provides an

effective method to source low-cost, non-commercial products. Malta has a similar practice, letting people grow up to four plants. The policies aim at reducing harm, specifically avoiding contacts between non-commercial users and criminal networks. Canada's federal law allows up to four plants per household. Some provinces, like Quebec and Manitoba, have restricted or eliminated home growing altogether, creating a patchwork of rules. Where this is permitted, the market of home cultivation feeds a subset of consumers without undermining the egitimacy of the legal retail system, as the majority of users are still dependent on commercial options. Home cultivation is usually not related to large-scale diversion or serious losses in terms of tax revenue, since it is produced in very low quantities and has differing quality. It provides individual freedom instead, and limits the forces on commercial systems to fulfil all forms of demand. In Uruguay, home-cultivation constitutes a key structure of the legal supply network and is used along with pharmacies and cannabis clubs to diversify availability.

Public health is still at the core of all progressive regulatory models. Canada's plain packaging regulations specify the use of neutral colours, standardised fonts, and health warnings. The mandatory THC labelling and warning statements also enhance consumer awareness. Most regulated markets prohibit advertising, not much more than limited informational content. Canada prohibits lifestyle advertising, endorsements or promotional giveaways. Promotional activities are also regulated in European pilot programs, aiming to limit commercial pressures that may result in greater consumption. These actions align cannabis policy with tobacco control principles formulated to minimise youth take-up.

Product safety constitutes a key component of the regulation of cannabis. Structuring oversight at the level of contamination risks and potency variability. Licensed producers are typically required to test for potency, pesticides, heavy metals and microbial contamination. They are actively enforced in mature markets. As a result, California's Department of Cannabis Control issued several recalls and embargoes in 2024 (Department of Cannabis Control, 2025), owing to inappropriate tests and contamination issues. Cannabis has documented accumulative heavy metals from the soil. Regulators in both India and the United States have highlighted the plant's ability to extract cadmium and lead, encouraging them to stress soil testing and quality control ahead of plant cultivation. It is the responsibility of retailers to make sure that products match laboratory standards. Some places impose caps on THC concentration, especially in edibles or extracts. These limits target accidental overconsumption and acute intoxication. There is also legislation that mandates packaging that can not only be used in a

child-safe manner but also should be child-resistant to shield it from accidental ingestion.

Constraining access to cannabis for youth is one of the most important goals of cannabis regulation. A minimum age limit and identification checks are mandated in all legal markets. Most jurisdictions have a statutory minimum age of 18 or 21. Quebec raised the minimum age to 21, and saw cannabis use decrease by 51 per cent across the 18 to 20-year-old population as compared to other provinces.

RESTRICTIVE MODELS

Policies for cannabis have a varied degree of restriction and control, and restrictive models are the ones that focus on prohibition or the highest level of regulation. Cannabis prohibition and regulation started in the 19th and 20th centuries, along with the prohibition and regulation of other plants like coca and opium. According to a report by the 2002 Senate Special Committee on Illegal Drugs in Canada, while plants like coca, opium and cannabis, which had deep traditional ties to their native countries, were subject to the most stringent regulations, the cultural products of the developed nations such as tobacco and alcohol along with synthetic substances developed by their factories were either permitted or faced more relaxed regulation (The Senate Special Committee on Illegal Drugs, 2002). It is claimed that early control measures of cannabis were, in fact, used as measures to control certain groups or sections of society.

The beginning of the contemporary prohibitionary policy model was made by the Single Convention on Narcotic Drugs,1961, which limited "the production, manufacture, export, import, distribution of, trade in, use and possession" of cannabis exclusively to medical and scientific purposes. It was listed as a substance with high risk of abuse, along with some of the most dangerous substances like heroin, in its schedules. While cannabis control policies were also included in the International Opium Conference in 1911 in The Hague, after the dissolution of the League of Nations, new conventions were required. Before the signing of the opium conference, any attempt to ban cannabis was seen to be unsuccessful, largely due to the lack of a proper international agreement to control cannabis trade, thus necessitating the presence of this conference.

The motive of the prohibitionary policies to criminalise the sale, manufacture, use and possession of cannabis was to deter its use and control the adverse effects of cannabis consumption on public health, especially the long-term effects. Despite the high rates of cannabis use among the public, especially the youth and the prevalence and access to cannabis products even in countries following a prohibitionary

model, it is claimed that consumption rates would be much higher in the absence of such policies. Supporters of prohibition also claim that since most policies are unable to eliminate unwanted behaviour, such as corruption or gambling, the fact that cannabis policies are unable to do so is not a reason for their failure.

While several reports claim that prohibition as a policy failed, it remains one of the most widely adopted models in the world. Currently, 144 nations have made cannabis illegal, whereas only 7 nations have made it legal (World Population Review,2025). The rest of the countries lie between this spectrum of control, with some practising more restrictive policies and others practising freer policies. The enforcement, punishment and regulations differ greatly in the countries following this model. In the EU, for example, the policies adopted by each member state can be classified into two categories (European Monitoring Centre for Drugs and Drug Addiction, 2023). In the first category of countries, cannabis is regulated differently from other drugs because legal penalties are based on how harmful a particular substance is considered to be. These countries use drug lists or classifications, outlined in legislation, to assign varying levels of punishment for drug-related offences. In much of Europe, cannabis is typically placed in categories that attract comparatively lower penalties. In the second category, all drugs, including cannabis, are subject to the same legal penalties. However, police guidelines, prosecutorial priorities, or judicial discretion often lead to practical differences in how substances are treated. These differences may be based on perceived levels of harm or resource considerations, and they can influence how both drug use and drug supply offences are handled. Some countries may even criminalise the possession of cannabis for personal use, even in small quantities, with varying levels of penalties. While countries like the UK impose punishments involving warnings, in Middle Eastern countries, the government imposes harsh penalties like rigorous imprisonment or even the death penalty in extreme cases for possession of cannabis for personal use. As research on the medicinal use of cannabis grows, its permissive use is highlighted in the policies adopted by several countries. The potential of cannabis in this field was recognised right from the signing of the 1961 convention, where cannabis was permitted for medicinal purposes. For example, Chile has had cannabis based medicines legal since 2015. Countries like Mexico also allow for medicinal cannabis to be prepared and distributed by the state only. While policies regarding recreational cannabis may or may not see relaxation, medicinal cannabis policies are moving towards a more liberal environment. Apart from state regulation and control, countries also adopt policies like setting a maximum limit for THC content or only using certain isolated chemicals from cannabis for preparing

medicinal cannabis. Currently, more than 30 countries (World Population Review, 2025) have made medicinal cannabis legal; however, access to this is not the same throughout. Some countries impose stringent regulations even after legalising medicinal cannabis, making its production and consumption scarce.

LESSONS FOR INDIA

The Dutch "coffeeshop" model can be replicated in India to tackle the problems of overcriminalisation and burden to the prison system of India posed by the harsh regulations on personal consumption of cannabis. Rather than aiming at abstinence, which Indian authorities have failed to achieve, there should be a greater focus on minimising high-risk behaviours associated with cannabis use. Using a government-regulated outlet, like the Dutch coffeeshops, to separate the hard and soft drugs market and ensuring quality controls and safer use helps reduce the overall negative impact of cannabis better than prohibition. Although the concern regarding illegal supply remains, public sector ownership or licensed suppliers are methods that can be used to tackle this problem. While some states have started focusing on this direction, India can direct its policies to promote medicinal cannabis more comprehensively. Currently, all the Indian states do not allow for this, and even in those states where medicinal cannabis (with low THC content) is legal, the regulations, research gaps, ambiguity in laws and a restricted focus on the Ayurvedic systems makes the scope very limited. To yield the health benefits of cannabis as well as the potential economic benefits, a more well-defined cannabis policy must be adopted. Public health-centric models like Canada can be used for more insights to prepare a more suitable policy. State-regulated retail policies adopted by countries like Uruguay can also be used to control the supply and production of medicinal cannabis. This may mitigate concerns regarding leakages of cannabis into the illegal markets, and the THC content of medicinal products can also be easily monitored.

From a scientific and economic perspective, India can take lessons from the US, especially from the way cannabis was legalised in states like Colorado, Illinois and Massachusetts. These states have managed to bring in a significant amount of tax revenue from cannabis sales and have witnessed great scientific progress in cannabis research. Especially in the sphere of research and development, India lags behind many countries. Given the great traditional and cultural ties this substance has with India and the immense research potential, it is necessary to direct more attention to this. Revenues from cannabis tax can fund anti-addiction programmes, thus impacting the public dependence on drugs as a whole. However, such market-based models would require a gradual and phased rollout to avoid market saturation

and to address public health concerns. Strict THC caps, marketing regulations and statutory warnings would also be essential. However, while lessons can be drawn from the market-based model, the federal-state differences, ambiguity and complexity in the US policies must absolutely be avoided.

07

ETHICAL AND GOVERNANCE CHALLENGES

ETHICAL AND GOVERNANCE CHALLENGES

INDIVIDUAL FREEDOM VS. PUBLIC HEALTH

Many adults view cannabis consumption as a private conduct that should not be subject to state interference unless it directly harms others. The core argument in this context is that individuals, specifically adults, are competent and have legal and moral rights to make decisions about their own bodies. Cannabis use, under this view, falls under lifestyle choices similar to alcohol, caffeine or fast food consumption. A new term comes into the picture when we talk about individual autonomy, that is, "state paternalism", where the government restricts an individual "for their own good"; this is often viewed as ethically problematic unless justified by strong evidence of harm. However, in such cases, it is especially crucial to define autonomy, as there are social consequences that necessitate state intervention. Thus, such autonomy-based arguments create a starting point for discussion, but not a conclusive justification for unregulated access and absolute autonomy when we talk about cannabis consumption. The state is still expected to set boundaries to ensure that private behaviour does not translate into public harm.

When we talk about the consequences of disregarding state paternalism in cannabis consumption, public health and safety risks surface. The problem is not that individuals choose cannabis, but the environment in which they choose becomes unsafe. As discussed earlier, cannabis's health impacts are well established, but deregulation raises additional concerns. Without state oversight, producers may adulterate cannabis with heavy metals, harmful pesticides, artificial potency boosters, synthetic cannabinoids, etc, and unregulated supply chains repeatedly lead to contaminated products, leading to mass health problems. surface. This is not about stopping the adults from accessing cannabis, but rather about ensuring the products they access are not dangerous. When there are no testing and labelling requirements, consumers would not know the THC content and presence of allergens in the products. Rejecting state regulation would mean no age verification and limit rules; this would increase risks to juvenile health nationwide, given the well-documented adverse effects of cannabis on

children. There would also be no regulated markets that the government and researchers can track and be aware of; illegal networks would rise and start to operate more freely, leading to an increase in crime rates.

These issues demonstrate that cannabis regulation is not intended to undermine individual autonomy, but to safeguard public order and reduce avoidable strain on public healthcare systems, particularly in developing countries. In such a case, a great burden will come on government health-care providing institutions, which, especially in developing countries, are already underdeveloped. Although the issue lacks a straightforward answer, it requires policymakers to balance adult autonomy with harm prevention and public order. Policymakers must therefore balance the following requirements for smooth functioning:

- Respect for adult discretion
- Duty to prevent avoidable harm
- Obligation to maintain public order and safety

Concerns would arise and force the public health system to deal with a range of systemic and administrative costs due to market chaos, and not cannabis consumption per se. High health-related cases resulting from cannabis consumption lead to a burden on the health system, as the hospitals and health institutions would need to respond to this cumbersome situation, adversely affecting public health infrastructure. More resource diversion, an increase in emergency, an increased demand for toxicology testing and higher operational expenditures. Increase in unregulated products multiplies the costs of preparing the health authorities for contingencies, where the state will have to introduce new medical guidelines, expand protocols and invest more in specialisation of emergency personnel. Subsequently, the burden will also be on mental health-centric authorities; generally, services provided by such institutions are funded through licensing taxes, with no proper structure. A great burden will fall on public services, outreach programs will have no funding, more and more counsellors and psychiatrists will need to be hired, and the operations will have to be expanded. As implied earlier, in unregulated markets, misinformation would spread, leaving the authorities to invest heavily in awareness campaigns, risk communication and myth-busting.

In a democratic society, there is an untouched and unexplored space where two key concepts, what the state must regulate and what individuals should be free to decide for themselves. Why is it such that not everything is black and white, neither absolute freedom nor absolute control? The challenge is to respect personal discretion while ensuring that discretion does not cause harm to others. Freedom is meaningful only when individuals make it

meaningful. A prudent society values autonomy and treats citizens as capable moral agents whose judgment is respected. However, it is important to consider that individual choices exist within the community and not in isolation, and these may bear direct or indirect consequences. It is the state's responsibility to ensure that the exercise of personal autonomy does not undermine the stability, fairness and order of the society. Ultimately, balancing protection and choice is about trust and shared responsibility. The state trusts individuals to act according to their own interests, and individuals trust the state to maintain a fair and stable environment. This relationship works best only when the state intervenes only to uphold collective interests, and individuals recognise that their freedom is grounded in the social system they are part of. This approach moves beyond rigid paternalism and unchecked liberty and seeks a middle path.

OVER COMMERCIALISATION RISKS:

Commercial cannabis markets have grown in many regions, but they have raised concerns about how this commercialisation impacts public health and regulation. Over-commercialisation is most apparent in the regulated markets of cannabis. Companies around North America have taken a very active role in helping shape legislation and stop laws that would restrict profitability. They have also played a leading role in early regulatory discussions that have shaped taxation, product controls and distribution rules. Efforts to implement caps on THC potency in some states in the US did not continue in the face of industry protests. These efforts to limit high-potency products were unsuccessful in Washington State as well as Vermont, with no advanced resolution to limitations on THC content for flower and extracts. In California, flavour restrictions were avoided despite strict regulations for flavoured nicotine products. Proposed bans on some pesticides in Colorado were modified after complaints from cultivators who said more stringent rules would lower yields and raise expenses. Large investors in hemp-intensive companies play into the impression that cannabis is an emerging sector ripe for innovation. The Ayurvedic regulatory route has since emerged as a main instrument for business development. Preparations using cannabis leaves, which do not belong to the narcotics class as defined in the NDPS Act, might be subject to a license as Ayurvedic proprietary medicines. This allows extracts, tinctures and tablets to be purchased relying on references to historic texts rather than modern-day evidence. In 2024, the Ministry of Ayush formalised the issuing procedures for approvals and documentation of cannabis-based products, providing manufacturers with a relatively predictable pathway for the commercialisation of cannabis-based products at scale (Ministry of Ayush, 2024). Edibles and vapour-based goods have become popular in various countries.

Edible packaging tends to look similar to popular sweets, with bright colours and stylised designs. The youth generally see these goods as trendy and somewhat harmless. In India, the same trends manifest themselves in the guise of cannabis-leaf chocolates distributed quietly in small community establishments. Venture-backed companies such as HempStreet and Bombay Hemp Company sell gummies, flavoured tinctures and oils labelled as Ayurvedic remedies through e-commerce with few age-related access barriers. Marketing activities aid these trends. Because the direct advertisement of intoxicants is limited, companies turn to surrogate methods. Their brand identity and branding are supported through hemp-based clothing and accessories, and social media influencers showcase hemp wellness products as stress, sleep, or lifestyle-advice aids. Such means of communication mix traditional words with modern branding and represent cannabis-based products as a part of larger trends in health. They prepare young users for an interaction with those products, but do not explicitly state psychoactive content. Commercial markets influence product potency as well. Concentrates, vape oils, and other high-strength preparations have already been released in different countries. These products can have much higher levels of THC (69 per cent on average) than standard marijuana (21 per cent on average) (Washington State Liquor and Cannabis Board, 2024). Though the THC content of cannabis raw material is lower, extraction from legally permitted cannabis leaves in India produces concentrated oils. Companies classify their oils by their potency and promote them accordingly. Not all are tested using consistent and well-resourced techniques, and thus, labelled potency might not always be the same as the actual concentration. Discrepancies between them for both producers who look for the laboratories to give them higher potency findings and samples processed in a way that improves strength have been observed in other markets. These changes come with issues of contamination. Cannabis plants from the soil absorb heavy metals and pesticides, and inconsistent testing could allow infected crops to reach consumers. Regulatory capacity is a crucial element for India. Organisations with the mandate of regulating pharmaceuticals and food products are under limitations in the frequency of inspection, laboratory facilities and the enforcing nature. Contaminated cough syrups shipped from India led to cascading consequences if there were failures or gaps in quality-control procedures. The pressure is also intensified by the application of existing oversight architectures to cannabis extracts, which need sophisticated testing in multiple categories. Food safety authorities wrestle with supervising new edible products, many sold informally with unknown dosage and poor traceability. There is another complication in the Ayurvedic pathway, as modern extracts are currently assessed

based on rules developed for the traditional formulations. Commercial medical products that have been licensed as Ayurvedic proprietary medicines are based on references in the text rather than use of medical data. Online consultation tools give speedy approvals and access to powerful extracts at a wider distribution. Such systems produce a hybrid market where commercial activity unfolds within a regulatory environment that was not initially designed to regulate concentrated psychoactive preparations. When firms develop distribution and customer familiarity, implementing more stringent regulations may become much more challenging down the line.

EQUITY AND INCLUSION:

For many decades, cannabis has been integrated into the agricultural and cultural life of some parts of India, and for a very large number of them, the cultivation of the plant has been a matter of survival as opposed to a criminal venture. In parts of Odisha, where isolated hilly grounds and a lack of proper irrigation make different crops practically impossible, the farmers keep on growing cannabis because of good returns. One plant, only eight to ten feet tall, can produce about a kilogram of viable material, which farmers can sell to local traders for around ₹1,000 to ₹1,500. While far below the price brought to market under the cover of black markets in big cities, it remains more profitable than crops such as millet, which suffer from volatile prices and limited procurement systems. For those farmers, cannabis income provides essential services, including children's education, basic health care and the cost of living. Income generated from cannabis cultivation helps farmers support household costs, including education and healthcare. In areas where alternatives are few, the plant is not regarded as a dangerous substance but a reliable crop. The landscape had changed radically with the enactment of the NDPS Act back in 1985. The international pressure tied to treaty obligations had led India to enforce strict controls on cannabis resin and flowering tops. These traditional cultivation practices became offences almost overnight, and a good number of rural households faced punishment with no reasonable economic alternatives. The law did retain an exception to cover cannabis leaves and seeds, but the distinction did little to protect cultivators. Though farmers, who had historically grown mixed-use plants, were more exposed to police intervention, their practices were merely long-established customs rather than participation in trafficking networks. In Himachal Pradesh, among other states, young people's fear of being prosecuted has discouraged them from learning cultivation practices, even though cultivation practices used to be one of the region's livelihoods. Criminalisation only drove the farming underground and increased the reliance of farmers on middlemen who carry little risk but take

most of the value. Leaves are not considered cannabis under the NDPS Act, and are sold legally in shops operated by the government, where sales are made only at government-licensed outlets. However, the cultivation of the plant for leaf use is not clearly defined in law. Much of the material sold as leaves comes from wild growth or official stockpiles. A farmer who grows plants for their leaves can still face prosecution if flowering tops are detected or if the harvested material is assumed to be intended for resin production. This leaves cultivators with little to no outlet for cultural and religious use and leaves them open to permanent legal risk. It acknowledges consumption in limited settings, but does not provide consistent support or protection for the people who grow the plant.

State-level policies proposed by virtue of Section 14 of the NDPS Act have introduced new varieties of exclusion.

Uttarakhand was the first state to allow for industrial hemp cultivation, and presented the policy as a means to boost rural incomes while promoting farming in areas with out-migration. The requirement that hemp has less than 0.3 per cent THC makes many indigenous landraces unsuitable for cultivation. These landraces can have variable cannabinoid levels due to high UV exposure and open pollination. The threshold requires farmers to buy certified seeds from established suppliers rather than the seeds they have cultivated for generations. If the crop breaks due to natural stress, it has to be destroyed; the financial burden is entirely on the farmer. Such a system lowers seed autonomy and puts biological and regulatory risk onto those with the least capacity to absorb losses.

Licensing requires several documents, including character certificates and extensive land records. Farmers with low literacy or no access to government offices generally depend on intermediaries who charge fees, which increases the cost of entry to the program further. Compliance requirements regarding secure storage and fencing compound the costs. The policy structure impedes independent participation for small farmers and favours those with administrative power and capital. Other states have similar strictures.

Uttar Pradesh largely restricts cultivation to research institutions and their contracted-out farmers, thus participation is based on institutional associations rather than experience in agriculture. Madhya Pradesh connects hemp production with industry and medicine, which demand technical know-how and investment. These are the sort of circumstances that exclude farmers without the capabilities for specialised supply chains. Contract farming mechanisms have emerged in the fledgling legal system. These agreements connect farmers to companies that supply seeds and purchase the material. But the risks of growing crops stay with the farmer. When a crop does not meet THC requirements, or it cannot be processed in time, the farmer suffers. Uttarakhand reports that the expected returns are not always realised due to limited processing capacity, late payments and logistical gaps. The value of processing, extraction and branding is pocketed in urban centres by well-endowed industrial players, and farmers receive meagre returns for the raw stalks or seeds. In the medical cannabis market, affordability is still a key worry. Vijaya extracts marketed as cannabis are at a high price, with a price range of ₹4,000 to ₹9,000. An additional cost is the consultation fees charged by Ayurvedic practitioners. These products are mainly available for urban consumers with disposable income. This has led to restrictions on traditional preparations made with leaves or low-cost extracts, which rural patients who have traditionally relied on those forms are forced to practice otherwise. The system allows expensive commercial products to be sold but fails to meet the medical requirements of low-income patients, and is thus creating gaps in access to pain relief and therapeutic uses. Dust generated during the process of hauling hemp can damage respiratory health. Manual harvest and fibre extraction are strenuous work in hill regions with poor mechanisation, which leads to chronic strain. Workers tend to lack protective equipment and health insurance, showing broader patterns in India's informal agricultural sector. They are often the most deprived players along the supply chain, but the people engaged in illegal farming are left exposed to higher arrest and penalties under the NDPS Act. There are also regional disparities in the benefits of legalisation. Uttarakhand has seen investment, but not all farmers in remote regions are involved because of wildlife damage, poor infrastructure and bureaucratic hurdles. Himachal Pradesh continues to depend on informal resin production, and the shift to regulated hemp may not guarantee similar returns for communities long been based on income derived from resin. States such as Odisha and certain states in the Northeast have very strict prohibition regimes, so farmers whose activity gets treated differently in other regions are criminalised. Geographic inequalities in the implementation of cannabis policies affect the choice of a livelihood because this policy is

implemented unevenly, or because geography itself creates imbalances in employment opportunities.

SAFEGUARDING INDIGENOUS RIGHTS

Traditional knowledge is the knowledge, know-how and practices developed and passed for generations, forming an integral part of the identity of a community. Due to the longstanding relationship of cannabis with the local communities of India, there exists abundant traditional knowledge among the Indian communities regarding cultivation practices, medicinal and therapeutic uses, and other innovations of cannabis. Furthermore, traditional knowledge is a key element of drug development, and cannabis has considerable potential to be an important material to manufacture medicinal drugs. Using traditional knowledge of plants like cannabis in the healthcare industry helps India make progress in its constitutional goals of social justice and welfare. However, the commercialisation of cannabis poses a threat to the traditional knowledge of cannabis in Indian communities, requiring the presence of a legal framework that can ensure ethical extraction and use of such knowledge without exploiting the indigenous communities. Traditional knowledge has a communal nature over which companies often try to get an exclusive right under the existing Intellectual Property Rights framework, which leads to biopiracy. In the context of cannabis, biopiracy would mean companies obtaining exclusive legal rights over cannabis preparations, methods of cultivation, and other cultural practices with the help of patents to commercialise them without sharing the benefits earned with the indigenous communities who might have been using these preparations and methods for centuries.

Past cases have shown that indigenous communities often lack the legal power to challenge such patents and thus end up being exploited by such companies, with their cultural assets being stolen and undermined. The Convention on Biological Diversity (CBD) and the subsequent Nagoya Protocol were established for the purposes of ensuring equity and access to the benefits from traditional knowledge by providing legal frameworks to establish Access and Benefit-Sharing, which refers to the way genetic resources can be accessed and how the benefits resulting from their use can be shared by different people.

However, as indigenous communities lack legal knowledge and representation, they might face difficulties accessing the safeguards provided to them by such international agreements and may face problems in protecting themselves. It is also necessary that these legal frameworks are implemented properly, or else, even in the presence of benefit-sharing agreements, indigenous communities might be compensated inadequately for giving rights for commercial use. To understand the possible risks indigenous people face from the commercialisation and patenting of traditional knowledge, parallels can be drawn from a case study. The following case study discusses the case of Indian wheat farmers and the US multinational company, Monsanto.

CASE STUDY: THE WHEAT PATENT

Since cannabis cultivation, especially for commercial purposes, is either largely illicit or in its nascent phases, the impact of commercialisation and biopiracy on locals cannot be understood directly. However, there exist many examples of different forms of traditional knowledge being exploited by large corporations. Hence, the purpose of this case study is to understand the repercussions of biopiracy on indigenous people and to understand the hypothetical situation of the commercialisation of cannabis in India and its impact on local cultivators. Nap Hal is a strain of wheat long grown by Indian farmers with unique properties. It has a low gluten content, making it ideal for certain traditional Indian foods, and is suitable for making crisp breads. It is said that the development of this strain is owed to the crossbreeding of plants by generations of Indian farmers. On May 21, 2003, the European Patent Office granted the US-based multinational genetically modified seed-based company Monsanto a patent to a wheat variety called Galahad 7, which was developed by crossing Nap Hal and other naturally grown crops like Galahad. This variety had very similar properties to Nap Hal. Monsanto procured patents not only for the wheat but also for a variety of bread and bakery products. According to experts, the patent would prevent breeding of other high-quality strains of wheat using Nap Hal. With this patent, Monsanto can take legal actions against all individuals for producing and selling products made from this wheat and against the scientists and farmers who are breeding new varieties of wheat using this particular strain. Different organisations and the government viewed this patent as an act of biopiracy, as a plant which had been grown by indigenous farmers for centuries was patented as if it were a new invention. The patent granted exclusive rights of ownership of a plant, which had been an integral part of India's agricultural landscapes for centuries, to a foreign company without permission.

With support from environmental and social groups, India started a legal and political campaign against this patent,

arguing that Monsanto had not met the criteria of innovation or new inventions required for a patent, thus invalidating the patent granted to them. Finally, in 2004, the European Patent Office overturned its decision and revoked the patent granted to Monsanto, because the wheat variety was developed using pre-existing knowledge available in the public domain. This case is used as an important example of the inadequacies in IPR laws, which often fail to take into consideration aspects related to traditional knowledge. The traditional knowledge of cannabis is extensive in India. If legalised, similar cases of exploitation and biopiracy are risks that need to be considered before the formulation of any law. Indigenous people might not only face struggles regarding commercialisation, but also pressure to alter traditional practices, taking away their cultural and social significance, loss of autonomy due to pressure to give consent for use, and unfair sharing of rights and benefits are also major threats to their well-being. The economic pressure on indigenous communities often forces them to alter their practices to suit the market demand, stripping away their independence and the cultural integrity of their practices. Due to the power imbalances between the corporates and the local communities, they may not be well-informed about the implications of the alterations to their knowledge, and any agreements formed are in favour of the corporates. Thus, these communities are unable to gain any benefits from commercialisation and, in fact, lose out more than before commercialisation.

Despite all the challenges, India is in a better place compared to other nations, as it is the only nation to have a comprehensive institutional mechanism called the Traditional Knowledge Digital Library (TKDL), acting as a unique repository of India's vast traditional medical knowledge. It is a database containing over 34 million pages of information about 2.26 million medicinal preparations, assisting patent officers by providing them with all the information regarding India's traditional knowledge and helping to tackle the problem of biopiracy. Having access to the database enables patent examiners to quickly identify applications that obviously fail to meet the novelty criterion early on. In the absence of a TKDL database, cancelling a patent becomes a costly and time-consuming process. The TKDL features a comprehensive global biopiracy monitoring system that tracks patent applications involving Indian traditional medicine. This facilitates prompt identification of third-party efforts to unlawfully claim such knowledge through worldwide patent filings. Consequently, swift remedial measures can be implemented at no direct expense to stop biopiracy.

08

STATE-SPECIFIC CASE STUDIES

STATE SPECIFIC CASE STUDIES

UTTARAKHAND HEMP POLICY

Uttarakhand was the first Indian state to permit cannabis cultivation for industrial purposes in November 2015. The first license was granted to the Indian Industrial Hemp Association (IIHA) to plant hemp on 1000 hectares of land (Joshi, S., 2020). This landmark policy shift was a result of Uttarakhand's geography, economic potential and history. Uttarakhand has been a state with tough environmental and geological conditions. Its topology and water scarcity, coupled with the presence of unrestrained animals, leave little space for flora to grow and thrive. Hemp is a plant that requires less water to grow, prospers even in barren land and can be grown as a mixed crop. Due to such properties, hemp is a plant that is well-suited to be grown in this state, as evidenced by its long presence and integration with local traditions of Uttarakhand.Hemp has widespread uses, thus having the potential to provide multiple sources of livelihood to the people of Uttarakhand. Its potential to be used as a high-protein food, suitability for producing paper and construction materials (Hempcrete), a source of essential chemical compounds for drug manufacture, and bioplastics are all lucrative income-generating sources for Uttarakhand.

Hemp fibres were an essential part of the economy before the regulations and prohibition, with hemp fibres being known as Bhandela in Uttarakhand, which were manufactured by the Koli craftsmen. It was demanded in areas like Ramnagar and local fairs in Uttarakhand, such as Bageshwar and Jauljeevi. Before the introduction of machine-made textiles, Bhandela was the cloth of the masses and was a major clothing fabric of the poor classes in the summer months in areas like Garhwal. Thus, hemp can become an essential part of the village economy as it was in the past, and such a policy shift was required to

harness its full potential. It is estimated that hemp will generate around 240 crore rupees for Uttarakhand and lead to annual incomes of 1 lakh rupees for farmers involved in the sale of hemp. According to the 2016 Hemp Policy of Uttarakhand (Barik,M., 2023), the following are some of the important points:

1. A license for the cultivation of hemp will be given to farmers for hemp with less than 0.3% THC content for fibre and seed.
2. The license for cultivation will be granted by the District Magistrate in a duly filled format.
3. The farmers require a certificate for using hemp seeds with the permissible limit of THC content to receive a license for cultivation.
4. The policy also requires testing of the hemp in the form of a standing crop before harvesting at every stage of farming, the expenses for which are to be borne by the license holder. If any crop exceeds the permissible limit, it is to be destroyed.
5. The farmer applying for a license should own his land and needs to submit his and his land's details along with the necessary license fees and character certificate to the district magistrate.

The rule regarding THC content is critical, as it is believed that even 1 per cent of THC content can cause effects of intoxication. In Uttarakhand, the exposure to this rule is so widespread that the locals, who might not even be aware of the meaning of THC, are familiar with the numeric value of '0.3'.

According to a study conducted in the regions of Garhwal and Kumaon, there exist several local NGOs and organisations involved in the business of producing hemp products like cosmetics and textiles. These organisations often source the raw material, like hemp fibre and seeds, from the local farmers in nearby villages. However, testing or verification of the raw material procured is not done as per the Hemp Policy, as many farmers do not have licenses to grow hemp or do not grow hemp with permissible THC limits. Therefore, manufactured products that use hemp often may not follow the 0.3% THC rule and neither does the Hemp Policy of Uttarakhand explicitly mention this limit for hemp-derived products such as hemp oil, textile, flour, etc. This is because, irrespective of the level of THC content in the hemp, there are no intoxicating effects of hemp on humans when used for purposes such as construction, cosmetics, paper and clothes.

Traditionally, hemp has long been a part of the local cuisines of Uttarakhand and remains quite popular. Hemp is consumed in the form of roasted hempseed hearts, chutney, salt and oil. Hemp milk is another commonly consumed food material, prepared by grinding hemp seeds with water and sieving it, which is then used as a gravy for different vegetables like potatoes, cauliflower, etc. These food items, which are prepared using locally available hemp, do not have narcotic effects either. The Food Safety and Standards Authority of

India (FSSAI) has also permitted the consumption and sale of food made from hemp, provided it is prepared according to the set THC limit. Hemp is a dioecious crop, i.e. has separate male and female individuals, due to which it requires cross-pollination to breed. Thus, high rates of cross-pollination and wind pollination increase the difficulty in producing pure seeds, which have low THC and require expert and technical guidance to be pollinated. Under the Uttarakhand Hemp Policy, no specific government agency was empowered to conduct testing of hemp plants to ensure they are within permissible limits for granting licenses. Farmers themselves have to provide assurance and the details regarding the seed production, shifting the burden to the farmers rather than the government. Furthermore, if the crop produced is found to be exceeding the permissible limit of THC, it is to be destroyed without giving any compensation to the farmers, even after voluntarily reporting such hemp. This poses grave challenges for farmers in obtaining licenses for production. The local farmers face social stigma for producing even low THC hemp and may be ill-treated for producing hemp, which may be seen as a shameful act. Most businesses involved in the manufacture of hemp-based products purchase the raw material from cultivators rather than cultivating on their own. It is said that only about 10 per cent of the enterprises producing hemp products cultivate their own hemp.

While locally produced hemp is able to satisfy some amount of domestic demand, a significant portion is still met through imports. India imported raw or retted hemp worth US$17,610,600 (258,316 kg) in 2024 (World Bank WITS, 2024). This is because the hemp cultivation industry of India is still in its initial stages and restricted to Uttarakhand and Uttar Pradesh.

Today, there are many “ghost” villages, i.e. villages that have been abandoned by their inhabitants, across Uttarakhand(Singh K., Times of India, 2018). People leave them due to a lack of adequate livelihood, prevailing food insecurity and the difficulties of living on treacherous terrain. According to the 2011 Census, Uttarakhand had 1048 ghost villages with zero population. In the face of such a problem, hemp can provide a remedy. Not only can it provide significant revenue-generating avenues to the people, but the sustainable hemp can also be used to manufacture Hempcrete to solve the housing problem, and the food preparations can tackle food insecurity. The government’s attempt to solve the problem of migration and unemployment by permitting the commercialisation of hemp is certainly a step in the right direction. However, the current policy and the speed of enforcement are lacking, and some critical issues need to be addressed before the full potential of hemp is realised.

HIMACHAL PRADESH PILOT PROJECT

The Himachal Pradesh Cabinet authorised a six-month pilot study on January 24, 2025, to test regulated cannabis cultivation. The purpose is only to test the plant's potential as a consistent raw material for industrial and medicinal purposes, and the plant is not meant for recreational use. The pilot employs a phased approach, instead of immediate statewide legalisation. The Agriculture Department has become the nodal agency. Two state universities, Chaudhary Sarwan Kumar Krishi Vishvavidyalaya in Palampur and Dr Y.S. Parmar University of Horticulture and Forestry Nauni, will perform scientific evaluations. Their study is to find out whether cultivars of cannabis fit both industrial and medicinal needs in the climate and landscape of Himachal Pradesh. The six-month period will give time to develop agronomical data, test genetic consistency, analyse environmental responses, and establish a foundation for future expansion.

LEGAL FRAMEWORK

The NDPS Act, 1985, precludes cannabis flowers and resin but allows cultivation for industrial and medicinal purposes and as a scientific adjunct. Section 10 authorises states to permit cultivation for legitimate ends, and Section 14 authorises the Centre to allow cultivation for research purposes. Uttarakhand and Uttar Pradesh have already implemented these provisions for programs of controlled cultivation. The regulatory system of Himachal Pradesh is similar in that it separates industrial hemp from medicinal cannabis. On a dry weight basis, industrial hemp can produce not more than 0.3 per cent THC. The threshold is used as a reference limit worldwide to classify non-intoxicating cannabis. The pilot would use seeds with consistently low levels of THC, taking a 0.3 per cent limit makes the crop comply with industry standards and mitigates regulatory confrontation. The pilot will test whether some local varieties grown at a high altitude display a variation in THC levels as a result of environmental changes, and whether lower THC varieties still present constant chemical profiles for a select geographic level. While the regulations governing this kind of cultivation are not the same for medicinal cultivation, top cannabinoid pharmaceutical crops will have a regulatory regime similar to the opium regime. This includes secure cultivation zones, access control, and precise tracking. The pilot is framed on the twofold basis, the one that separates the industrial and medicinal value chains. This sets specific administrative steps that must be taken for it to be implemented by a committee chaired by the Revenue and Horticulture Minister. One window clearance mechanism will help facilitate decision-making among the agriculture department, Excise and Taxation, Health, Police, and other authorities. This centralises licensing and compliance efforts. The Excise and Taxation Department will be responsible for law enforcement.

ECONOMIC POTENTIAL

It follows a period when Himachal Pradesh is under heavy fiscal pressure, accounting for over fifty thousand crore rupees in expenditure for FY25 and obligations on payment of over five thousand crore rupees. The effort evolved from a mere mention in the 2023 budget session under Rule 130 to cabinet approval. The Chief Minister presented a potential annual income in the first session of the 2023 budget and economic expectations by the government place potential annual revenue anywhere between five hundred crore and two thousand crore rupees. The state must have processing plants for value-added products such as textiles, biocomposites, hemp-based building materials, and nutraceutical oils to realise above-target revenues. Applying such a single window mechanism is expected to serve processing units and related industrial infrastructure applications.

SCIENTIFIC EVALUATION

The scientific element depends on the two agricultural universities. Their tasks also include selecting suitable varieties, evaluating their agronomic performances, designing cultivation protocols, and setting up a designated seed base. A reliable seed supply is required for any future commercial program. The pilot will investigate THC dynamics in various environmental conditions, identify susceptibility to cross-pollination, and assess yield potential. Pre-harvest chemical testing is a major obligation, and THC level limits will require accredited laboratory capacity. The universities will also collaborate with medical colleges on research into potential therapeutic uses for cannabinoid extracts, including CBD-rich preparations for clinical application in pain and inflammation. The agronomic profile of the crop matches the climate constraints of Himachal Pradesh, as hemp uses way less water than cotton and uses fewer chemical inputs. Compared to cotton, studies on the two crops suggest that compared with cotton, crop water requirement for hemp is reduced by about forty per cent and irrigation requirements by over eighty per cent. Its drought tolerance and adaptability are advantageous for places where horticulture is under climate-related pressure. Expansion of agriculture on slopes must also consider ecological considerations. Zoning and monitoring will also be necessary to prevent unintended harm to the environment.

SOCIAL TRANSITION AND CONCERNS

Many farmers rely on illegal cannabis cultivation for income. Crop destruction, low payments from intermediaries and legal risk are the issues they face. The transition to a regulated system is also seen as a possible way out of this trap of unpredictability, as it provides them with stable earnings and less risk for legal

penalties. A legal framework would enable them to make use of their land as part of a formal supply chain and be free from regulatory action. Concerns exist about the possible exclusion of small growers, corporate control and centralisation of the rights to grow to a few big players. There is also a concern that licensed operators could lead material into illegal markets if there are oversight loopholes. Some proposals to deal with these problems in particular would include the supply to village members of certified seeds, setting the procurement rate as a 'guaranteed' and placing the government as a primary buyer at the 'initial step-up' stage. It also stabilises farmer participation and helps to alleviate dependence on intermediary providers. Training in digital licensing and compliance systems will also be required, as growers will need to comply with regulations from a larger entity without putting them at a disadvantage. There have been public health concerns about the pilot. The pilot is confined to industrial and medicinal uses, but the broader concern relates to drug misuse and unemployment among youth. Rehabilitation and demand reduction programs are needed to complement any change in cultivation policy. These measures form part of the state's wider drug prevention framework. The pilot is largely about the regulation of the amount of THC. THC levels are likely to fluctuate according to genetic stability, environmental stress and pollen flow. Certified seed sourcing and mandatory pre-harvest testing are necessary to maintain compliance. Crops over 0.3 per cent will be destroyed in the pilot. Diversion into illegal trading involves heavy supervision and transport procedures, as well as enforcement personnel. These controls will likely be bolstered by digital systems. The state hopes to employ geo-tagging, QR-based tagging, digital licensing and blockchain-based ledgers to monitor cultivation, processing and distribution. Such systems will establish an auditable chain of custody and assist enforcement agencies in compliance assessment. International buyers appreciate traceability, and digitised systems can provide for certainty and consistency in the output.

LESSONS FOR INDIA

Cannabis is increasingly becoming accepted globally, putting India at a historical turning point. Currently the cultural and medicinal significance of cannabis is clashing directly with its prohibition in India as per the NDPS Act. In contrast, countries such as Canada, the United States, Germany, Thailand, etc., have adopted a regulated legislation bringing economic growth, research and improved public health outcomes rather than prohibtion.

India's key lesson should not be whether to legalise cannabis, but how to draft the necessary legislation. A legislation which balances its scientific, medical and economic benefits and avoids misue and

other social concerns. The law should be based off evidence-based policy making, economic considerations and public health concerns, rather than social stigma.

A balanced policy approach includes differentiating between:

- Industrial use
- Medical use of cannabis
- Recreational use

Most countries which have managed to establish successful policy models for cannabis usually follow this classification. Hemp, owing to its low THC content, should be treated as an agricultural commodity rather than a narcotic substance. Used cautiously, an evidence-based prescription system and pharmacovigilance are important in medical cannabis use. Cannabis use for recreational should come along with strict age restrictions, adequate taxation, and public safety measures. This framework gives India the power to control and increase value in low-risk segments like industrial while also managing a high-risk segment. The potential of industrial hemp due to its uses in textiles and sustainable fabrics, bioplastics and packaging, biofuel, construction materials such as hempcrete, paper and biodegradable materials and wellness and nutraceutical products, coupled with India's potential to grow hemp on a large scale, India shows high potential as a large-scale exporter. However, this requires a regulated and organised industry supported by farmer training, research institutions, and private investment. In addition, promotion of medical research is essential. Cannabis can be used to make medicines which help with chronic pain, epilepsy, cancer symptoms, PTSD and multiple sclerosis. India requires the collaboration of AYUSH, AIIMS, pharmaceutical companies and biotech companies to perform clinical trials and ensure standardised production. This would ensure a safe, scientifically validated, and ethically monitored medical use.

India can borrow successful control mechanisms from other countries:

- Minimum legal age for purchase
- Quantity-based purchase limits
- Mandatory product testing and THC limits
- Awareness campaigns and addiction services
- Strict penalties for illegal trafficking

By doing so, India can protect public health while reducing the burden of criminalisation for minor possession, which disproportionately affects rural youth and marginalised communities. Currently, India's cannabis laws suffer from ambiguity: hemp is legal in some states but not regulated consistently nationwide. To attract serious investment and research, India needs a transparent licensing framework covering:

- Cultivation permits
- Research and clinical trial approval
- Industrial processing licenses
- Pharmaceutical & manufacturing authorisation

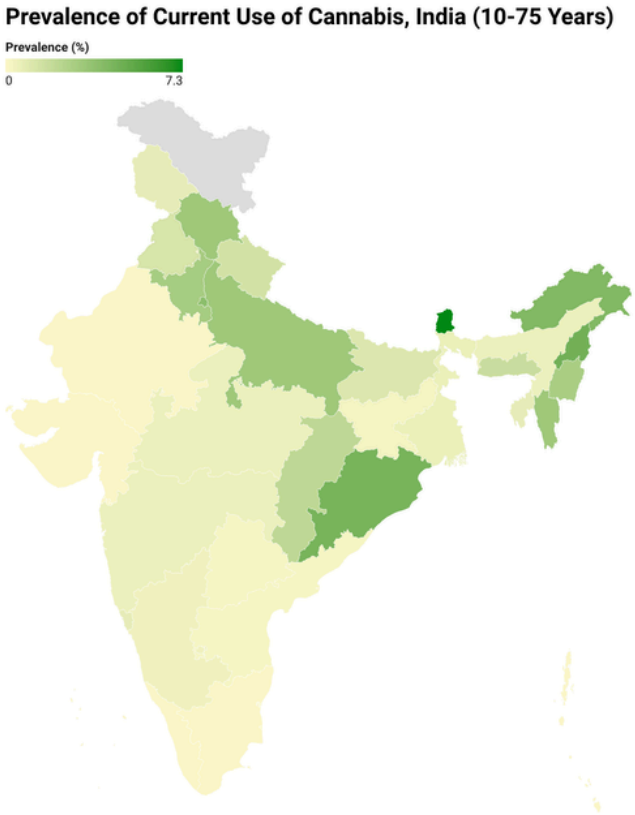
- Taxation and distribution

State-specific licensing can also support regional agricultural economies and reduce bureaucratic confusion. A regulated cannabis and hemp sector can unlock major economic benefits, especially for rural India. Opportunities include:

- Farmer cooperatives and contract farming
- Processing and manufacturing units
- Research and development centres
- Export-oriented production for medicines and hemp products

The regulated cannabis systems of Canada and the US produce billions of dollars per year. Due to its agricultural capacity and low cost of production, India can emerge as a key exporter if its policies are in tune with the world. Furthermore, workers at different levels can be found in this industry. Essentially, farmers and lab technicians are supply chain managers, researchers and product developers. India must take note of the global changes in cannabis policies. Instead, it must learn from global practices and move towards a regulated, scientific and socially responsible model. By differentiating industrial hemp from medical use and recreational use, we stand to release significant health, economic, and agricultural potential in India while minimising risk and misuse.

The map shows the prevalence of current cannabis use across Indian states among individuals aged 10 to 75 years, with higher usage in parts of the north and east and lower levels in many central and southern states. Overall, cannabis use varies across regions and is not uniform across the country. Data for Ladakh was not available and is therefore not represented on the map.



09

POLICY RECOMMENDATIONS

POLICY RECOMMENDATIONS

In the previous sections, we looked at cannabis policy in India across several dimensions. It started with a conceptualisation of the plant and its distinct variants, while the report went into the context of cannabis' historical and cultural usage within Indian society, then analyzed the legislation under the Dangerous Drugs Act of 1930, Narcotic Drugs and Psychotropic Substances Act of 1985, as well as the effects of legalisation on India, the economic side of legalisation and its associated costs, and comparative regulatory approaches made from other jurisdictions, including Uttarakhand and Himachal Pradesh to show reform taking place in India. All of these sections show that the current picture of cannabis is not based on a lack of economic or environmental content, but rather the law as a whole, regulatory inertia is not being addressed properly, governments aren't united, and state organisations in India can't act. Such domains are determined by the memory of individuals (e.g., farmers), religious belief, social stigma, competing stakeholder interests, and international treaty obligations that are in place, which determine the boundaries. Many related challenges arise in this context. Across India, legal uncertainty between farmers and investors is a result of non-consistent laws. Poor processing infrastructure limits the economic value that cultivation alone can generate. It is also hard to draw on a national level sense of knowledge base. Public health preparedness is still low in relation to the scale of change at hand. Cannabis taxation does not yet have a separate taxation system. Compliance with international treaties requires government coordination that is presently absent at the national level. We then make five thematic recommendations (industrial development, taxation, research and innovation, public health and international cooperation).

INDUSTRIAL DEVELOPMENT:

- Under the modified Production Linked Incentive (PLI) Scheme for Textiles, the government should further reduce the minimum investment hurdle to specialised natural fibres such as hemp. By the close of 2025, the threshold was lowered to ₹50 crore (Ministry of Textiles, 2025), but at this point, it should further incentivise MSMEs in

the Himalayan region to undertake processing at a secondary tier so as to encourage smaller, community-based processing units. The Ministry of Textiles also needs to establish dedicated HSN codes for the category of "Carbon-Negative Technical Textiles" to ensure selective export rebates (IJSRA, 2025).

- In hilly states like Himachal Pradesh, the government should further cut the land requirement for "Specialised Hemp Enclaves" down to 2 hectares for high-tech pharmaceutical extraction units, which need vertical space rather than sprawling acreage, from 4 hectares. These enclaves shall allow the import of duty-free machinery used for decortication and thus facilitate efficient sales of the refined hemp hurds and fibres to the Domestic Tariff Area (DTA).
- In order to shift hemp's market identity, the government should incorporate a "Heritage Fibre" branding mandate into the One District One Product (ODOP) plan. This branding must employ a cultural colour palette combining natural hemp colours (beige and oat) with authentic Indian natural dyes. Advertising such an aesthetic strategy should not be limited just to a visual decision but involve portraying eco-consciousness, which is beneficial for product longevity, by involving users in the purchase process.
- Under Startup India, the government should provide hemp startups with a toolkit to quickly address the NDPS (Narcotic Drugs and Psychotropic Substances) Act while avoiding administrative hassle. A dedicated "Hemp Innovation Fund" must be created to fund and facilitate the development of prototypes for hemp-based bioplastics. In addition, the BioE3 Policy must be utilised for setting up the National Hemp Bio-Foundries. This would establish a shared pilot-scale environment and research hub for AI-based metabolic engineering in the manufacturing of hemp: hemp breeding and production using the hemp breeding model to tune hemp for industries such as ultra-high cellulose content (BIRAC, 2024).
- The government must enable farmers and hempcrete manufacturers to exchange Carbon Credit Certificates (CCC) at national power exchanges. This reconciliation should be backed up with a price stability instrument that makes sure that revenue from sequestered carbon, which is believed to be 10 to 15 tons of carbon dioxide per hectare, flows to the horticultural farmers and thus encourages the production and cultivation of hemp (Climate and Law Initiative, 2025).

SCENARIO ANALYSIS:

In the short term, the sector will probably stay in a period of piloting and institutional learning. The emphasis will be on putting state-supported programs in practice, framing regulations and testing

cultivation in rigorous conditions. Early processing centres will likely be established, with state entities or a handful of private entities leading them. The economic returns are limited over this period, but the focus will be on operationalising state-led initiatives and testing cultivation under controlled conditions. The main goals of this phase will be regulatory stability, seed validation, and administrative capacity development.

- In the medium term, the stabilisation of seed systems and the availability of processing facilities, hemp fibre and by-products can be embedded within existing industrial value chains that include textiles, construction materials, composite manufacturing, etc. Demand creation by government procurement and sustainable industrial programs can motivate private investment. In this stage, economic contributions of the sector will increase substantially, and value addition will be directed closer to cultivation areas.
- In the longer term, hemp could serve as an input in a wider bio-based industrial transition. Sustainability and climate commitments at industrial policy levels will have become more significant, and hemp-based materials have the potential to replace petroleum inputs in construction and packaging. The sector could support a circular production system by sustaining low-emission industrial growth through renewable sources. Hemp would be considered an embedded part of the national environmental and sustainability plans.

IMPLEMENTATION CHALLENGES:

- As economically and environmentally viable as the hemp sector is, it faces several obstacles that limit its potential for expansion in India. The most immediate limiting factor is regulatory fragmentation, state by state. Only a handful of states have started with a regulated system, and a lot still have limited approval to grow cannabis and still consider it to be completely illicit for any reason, including diversion, enforcement capacity, and public safety concerns. Such disparity of policy results in uncertainty for farmers, as the legality of cultivation and the regulation standards of cultivation differ between states. Administrative reticence is compounded by judicial unwillingness to allow growth with enforcement voids. Hence, hemp remains a patchwork between the lines of bans and industrial acceptance, thus complicating long term planning and long-term investment.
- Social stigma still plays a huge role in policy implementation as well. Cannabis continues to be associated with illegal cultivation, and administrative agents still view cultivation applications with suspicion. Moving the crop from a narcotic origin to an industrial ingredient requires continued institutional messaging,

ongoing enforcement of THC threshold requirements, and tangible evidence of the success of regulated pilots. Without it, state governments are increasingly reluctant to bear political and administrative risk.

- There are several technological limitations to the expansion of cannabis as an industrial ingredient. Industrial hemp relies on processing infrastructure, both capital intensive as well as technically-expertised. Decorticators, fibre processing facilities and extraction plants are beyond the means of individual growers, and thus require collective infrastructure or a centralised plant system, and cultivation is unable to bring in any real economic value without state-linked processing centres or private companies investing in the business. The development and validation of such seeds take years of research and multiple crop cycles, resulting in slow scaling. A sustainable industry structure is required if there is to be enduring, and that will be possible and sustainable for the remainder of the industry, with institutional processes to guarantee fixed pricing, minimise costs by lowering the costs of transactions and connect cultivators to processors.

TAXATION AND REVENUE:

CONCEPTUAL FRAMEWORK:

- Recent times have seen increasing investments and relaxations of cannabis restrictions at a global level, based on the expectations of job creation, increased tax revenue, reduced drug-related crime, and agricultural development. In lower-middle-income countries like India, supporters of cannabis legalisation propose the revenue potential of cannabis as one of the key benefits. However, much of the present literature regarding cannabis taxation is modelled on high-income countries, which is not apt for countries like India.
- A major task to be handled involves deciding the basis of taxing cannabis, whether it be by volume, value, or concentration of THC products. The heterogeneity of cannabis products necessitates a comprehensive policy framework that properly utilises the taxation opportunities available at different stages of processing of the cannabis products.
- When seen from the lens of taxation, the cannabis market is also segmented into different uses, namely the medicinal, recreational, industrial, and research uses. Although each of these uses is interconnected, the tax treatment of each must be carefully drafted, unique to them. Due to these issues, cannabis can not be just treated with a blanket sin tax, and the assumption that a cannabis tax will lead to increased revenue may not be completely true. Using sin taxes is effective for domestic consumption, as they are a form of Pigouvian taxes that aim to internalise the externality of

cannabis consumption for recreational use. However, this approach is limited, especially when large amounts of cannabis are being exported.

- Another way of treating cannabis is by using taxes, which are similar to agricultural taxes. This approach involves treating cannabis tax in an agricultural context and applying similar tax policies as applied to other produce. This may be relevant to a country like India, where a large number of small-scale farmers are behind a majority of the total produce. Concerns regarding the different nature of cannabis as a product from other commercial crops and major differences in trade barriers and uses between these products reduce the feasibility of treating cannabis as an agricultural product.
- Finally, cannabis can be taxed as a rent-heavy industry, i.e., industries that involve goods that are sold way above their production costs. The cannabis industry operates in an environment characterised by large rents, which are driven by supply constraints imposed artificially, uncompetitive distribution channels, and high barriers to entry. The prices set by the underground market have always reflected more than the production costs, labour, and expertise required for growing and distributing the product; they also included large premiums for the risks of illegality. With the progress of legalisation, especially as growing shifts to cost-effective labour markets, the question that arises is whether prices can remain steady at rent-generating levels, and who might benefit from this? Governments might benefit from taxes, but the changing market conditions require scrutiny. New market entrants have experienced violent market gatekeeping in the past. Even if the violence subsides, legal markets for production, processing, and sales in low- and middle-income countries will likely impose significant barriers through license allocation, technical standards, or licensing fees.

POLICY RECOMMENDATIONS:

- Licensing frameworks for cannabis transactions can operate across various stages. These should encompass licenses for cultivation and production first, with state mechanisms to regulate plant potency and resin content. THC levels require defined minimum and maximum thresholds per gram, alongside rules governing soil contaminants and fertilisers in growing processes. To prevent dominance by major corporations and lobbying influence, states must cap total production volumes. Distinct cannabis varieties need clear identification through unique labels like names, producers, or categories. Countries should also conduct routine oversight of licensed retailers to verify compliance throughout the production

chain.

- Price control measures are important for eliminating the black market because if the legal prices are higher than the black market prices, it would encourage illicit trade. Therefore, an adequate and proportional tax is necessary to bring the prices lower than or at least equal to the black market prices. As discussed earlier, a hybrid tax model based on both weight and value should be adopted in India. This means products with higher THC content would attract a higher tax based on the potency, whereas products with lower THC content would be taxed based on the value of the product. Similar to alcohol, the tax structure could be divided into a state-level excise duty and a national blanket tax like GST. Tax exemptions for exports and uses in research and development would be used to avoid non-recreational uses of cannabis being harmed by heavy tax. Other forms of price control, such as minimum price flooring for recreational cannabis and maximum price ceiling for medicinal cannabis, can also be adopted as supplementary measures. This process would be rolled out in a phased manner, beginning from a few states that are rich in natural cannabis growth. Closely monitoring the market growth and consumption is essential to collect important data, which will form the basis for deciding appropriate tax rates in the future.

The tax revenue generated by the government should be earmarked for public health, drug rehabilitation, and drug education, thus leading to a circular economic model.

SCENARIO ANALYSIS:

- **Short Term:** This would start with the initial rollout in states like Uttarakhand and Himachal Pradesh, which are already moving towards the legalisation of medicinal and recreational cannabis. These states would witness the shrinking of the black market in the presence of cheaper and regulated cannabis. States would find an additional and reliable stream of revenue, which could be invested in public health and drug education. These states would also collect the data, which would form the basis of a tax structure to be implemented on a national level. The states might have to explore periodic tax breaks for farmers and small-scale producers to incentivise them to enter the market. The aim would be data collection, learning, and developing the tax framework.
- **Medium Term:** This would involve finalising the entire tax structure on a national scale using the data insights from the pilots started at the state levels in the short term. Tax revenue becomes a strong source of revenue for both the union and state governments. Data regarding the consumption of cannabis for different purposes and the prevailing prices assist the government

in determining adequate price control measures. License auctions are held for companies to enter the cannabis market, allowing the government to control the quantity of cannabis products in the market. This phase would be aimed at stabilising the structure of the cannabis market- the quotas, taxes, THC caps, and other price control measures.

- **Long Term:** In the long term, the black market of cannabis would decline substantially on a national scale. Cannabis would provide substantial revenue to the government and improve the general health of the citizens, due to an increase in public health and drug education. India's global standing in terms of research on cannabis rises due to the tax-exempt cannabis available for research purposes. As domestic demand starts to stabilise, producers direct their resources towards exports of cannabis in international markets. In the long term, the aim would be towards the expansion of cannabis on a global scale, sustainability, and research.

IMPLEMENTATION CHALLENGES:

- Since the tax structure would be based on the THC content of the cannabis, there will be technical challenges faced by the government while testing the cannabis to check the THC content. Since this forms the basis of further tax treatment, this is a critical problem that needs to be solved.
- Social and political barriers like social stigma, imperfection in information dissemination systems, addiction concerns, and opposition by politicians form a significant challenge to the implementation of the cannabis framework. Barriers to trade, like the international treaties, restrict trade to only a few countries and shift the benefits of exporting cannabis into the future.
- Cannabis would require the inception of a tax structure unique to it, thus complicating the existing structure and making it harder for the general public to follow. This would require amendments to current acts like the NDPS Act 1985 and the GST Act, 2017, which would lead to delay due to opposition and bureaucratic red tape. Determination of exact tax rates would require closely monitored pilots and rigorous collection of reliable data, which in itself is a tremendous task.
- Earmarking funds for public health, drug rehabilitation, and drug education would require a robust system for fund allocation, and any corruption would be detrimental to this. There would be significant concerns regarding the misuse of funds, which might lead to the promotion of the cannabis black market rather than its reduction.
- Ensuring farmer compliance and inculcation into the cannabis market may prove to be harder than it seems. Even though they may enjoy an

additional and much-needed revenue stream, the presence of adequate buyers, their ability to match black market prices, and the lack of capital for licences pose challenging barriers for farmers.

RESEARCH AND INNOVATION:

- Current cannabis research is fragmented across agricultural universities, medical colleges, and the private sector. The inability to create a consistent nationwide scientific research environment for cannabis remains one of the key problems. Current research is conducted under permission on an ad hoc basis, with access to existing institutional mandates. The major focus of agricultural universities is on varietal trials and THC compliance, and medical research is limited to small-scale studies using cannabidiol and pain management. There is little connection amongst these streams, and virtually no way to tie plant genetics and agronomy, processing and clinical use into a single research ecosystem. Consequently, we face a slow pace of innovation, redundant efforts and knowledge coming out of pilot projects that often don't translate into scalable practice. Moreover, the NDPS Act requires special approvals for handling cannabis flowers and resin, dissuading long-term laboratory work and restricting private sector participation. In recent years, research institutions have faced delays in getting approvals for procurement, storage, and disposal of these components, which made the process of sustained experimentation difficult.
- Another major limitation is the thin funding routes. With few specific calls for cannabis use by public research funding bodies, researchers are left without support to rely on general agricultural or biomedical grants geared toward cannabis use, which do not necessarily address specific compliance or infrastructure needs.
- Innovation in the private sector is likewise limited by uncertainty. Startups developing hemp materials, bioplastics or pharmaceutical extracts are frequently without well-defined research support systems. They are forced to develop custom methods alone, and therefore, standards across them may be inconsistent, and good practices themselves may not be widely adopted. The lack of shared research infrastructure, like pilot-scale extraction plants, advanced testing labs and breeding centres, is the major limitation, increasing the cost of research and slowing down the process.

POLICY RECOMMENDATIONS:

- The first consideration should be focused on establishing research clusters that bring together agricultural universities, medical colleges, material

science institutes, and engineering centres. These clusters must emphasise three related areas: seed development and agronomy; processing and material innovation; and medical research. Public funding bodies should propose specific research imperatives for cannabis innovation, such as plant genetics, climate resilience, low-input cultivation, fibre processing and therapeutic applications. Costs of compliance related to cannabis research, e.g. secure storage, testing, and documentation, should be considered in funding mechanisms. Without this adjustment, research institutions would continue to be hesitant to immerse themselves in the crop.

- Decortication, extraction and testing facilities need to be public or public/private assets. Such facilities would lower initial barriers to entry for startups, farmer collectives, institution researchers, and help standardise quality and safety practices. These research hubs need to grow and incorporate testing labs focused on THC stability, contaminants and fibre quality. Medical research should be institutionally connected to research on cultivation and processing. This would allow for consistent tracking of plant varieties. There should be national pharmacopoeia development and treatment guidelines rather than pure academic publications. A streamlined research approval process for licensed groups operating in approved research zones should be regularly introduced so as to facilitate private innovation. It would make administrative procedures quicker, but still with some degree of oversight.

SCENARIO ANALYSIS:

- **Short Term:** For the immediate future, research efforts would remain focused on a handful of pilot states and institutions. The emphasis would be on seed banks, low-THC variety verification, and general cultivation and processing protocols. Most innovation would happen through publicly funded universities and a handful of private firms closely associated with state governments. Output at this stage would mainly consist of technical guidelines and standard operating procedures. Its real ambition would be creating institutional capacity.
- **Medium Term:** Innovation would start to align with industrial value chains as research clusters developed. More precise seed varieties and standardised fibre processing methods, a new reliable extraction methodology might lead to greater consistency in production. Startups and cooperatives would be able to access shared infrastructure, resulting in less duplication and costs. Research would increasingly guide refinement of policy at this stage, helping regulators adjust THC thresholds, testing protocols, and the terms of licensing in accordance with empirical evidence.

- **Long Term:** In the longer term, cannabis research would become embedded in India's broader bio-economy and sustainability strategies. Innovation would be more about optimisation, and new forms of breeding, materials engineering and pharmaceutical research. India could become a knowledge producer instead of a supplier of raw hemp; research outputs would now feed into global standards and markets.

IMPLEMENTATION CHALLENGES:

- Investment continues to be a significant limitation for cannabis research. Cannabis needs more initial investments to invest in due to chemical testing and regulatory compliance than traditional crops. Research is restricted to a select number of universities and public labs with existing resources, effectively marginalising the more productive sector.
- Another challenge in improving cannabis research is the lack of coordination. Agricultural universities, medical colleges, and industrial research centres operate under different administrative structures and approvals, which makes joint projects slow to enter the market and hard to control. There is also a risk that research priorities may be determined by private interests. If private firms dominate research infrastructure or funding models, innovation may shift focus to proprietary products rather than public requirements. This can restrict access to new knowledge for farmers and to public health systems. That means research funding and governance must ensure results are open and usable beyond the corporate setting.

PUBLIC HEALTH:

- In previous sections, the risks and health costs associated with cannabis were discussed at length. Clearly, cannabis use poses significant public health concerns and demands the important task of drafting policy guidelines under the health sector for legalisation or relaxation of cannabis laws. Cannabis use has been associated with hindering brain development, unlawful activities, addiction, and psychological distress. India, with its large young population, requires

careful lawmaking to minimise these risks and extract the maximum benefit out of cannabis. As mentioned before, while a comprehensive analysis of the cost to the economy imposed by cannabis use has not been researched before, the costs incurred by other addictive substances like alcohol and tobacco underline the gravity of the threat created by cannabis abuse. While the proponents of cannabis argue that cannabis is a drug that is comparatively 'benign' in its effects on the health of the user, its opponents argue that it is a 'deceptively dangerous' drug, as the users are not immediately able to witness the ill effects of its chronic use. This debate about public health policy for cannabis stands only for its recreational uses and not the medicinal, therapeutic, and industrial uses, which largely require low THC cannabis. The government plays an important role in aspects of public health like product definition, quality and testing, safe limits, age barriers, and controls on promotion and advertisement. All these aspects must be covered under a comprehensive public health policy review for cannabis.

POLICY RECOMMENDATIONS:

- The first recommendation involves clearly defining cannabis and related products. Cannabis products can be consumed in different forms with different levels of intoxicating effects and health impacts. The concentration of THC can vary significantly from plant to plant. The chemical profile of cannabis plants are complex, and the variation in different strains and regions adds to the complexity. In the face of such complications, the government needs to clearly define the different products and concentrations of cannabis, as a blanket policy treatment to all of them would not be apt. This would require significant research into the cannabis plant and its related products. Synthetic cannabis and new forms of administration of cannabis must not be exempt from the law, merely due to the absence of necessary information, as this would be a great failure on the government's part.
- The second recommendation involves strict controls on advertisement, packaging, and promotion of cannabis products. These restrictions are essential to minimise exposure to cannabis and related products from certain sections of society, like the youth and children. Imposing age barriers for cannabis use is necessary to safeguard underage individuals from the health risks of cannabis. Ensuring random checks, proper information dissemination regarding safe use and guidelines, and upholding the established controls become the key pillars under this recommendation.
- A major flaw in policy guidelines for cannabis stems from the inadequate data available to the lawmaking authorities, which makes it hard to formulate evidence-based policies. The third recommendation is to tackle

this information gap. This can be done by formulating a robust surveillance system for investigation, data gathering, and evaluation regarding the public health effects of cannabis. This would help in making better policies that are backed by reliable data.

- A major threat to public health from cannabis use is also caused by lobbying by industrialists. Major industrialists may influence public health policy-making for cannabis use for private profits. In such a case, the policies may deviate from facts and public interest to ensure benefits for private industrialists. This is evidenced by the influence held by tobacco and alcohol companies on policy-making in the past. The fourth policy recommendation is about controlling this threat. Private industries often downplay the medicinal threats of cannabis by publishing biased, privately funded research. Publishing open-source public research is an effective measure to counter any biased research. Often, cannabis companies are part of the committees and teams responsible for formulating initial regulations for cannabis. Established alcohol and tobacco companies often diversify by aggressively investing in cannabis companies. Ensuring controls on such activities is essential to prevent lobbying by private firms.

SCENARIO ANALYSIS:

- **Short Term:** In the short term, despite all the restrictions, controls, and bans, there will probably be a spike in Cannabis Use Disorder cases and other health problems due to an initial increase in cannabis consumption. The surveillance systems and regulation committees would be handling the bulk of the work in this phase, which is important for future policies. The product standards, controls on advertisement, and closing basic data gaps are essential at this stage.
- **Medium Term:** Surveillance systems help reveal faults in the system, identifying areas for improvement and leading to evidence-based fixes in current policy. Provision of funds for drug rehabilitation and drug education is also an important element of public health policy in the medium term. In this phase, the aim would be to reduce the cases of sickness and CUD cases with randomised checking, proper policy formulation, narrowing treatment gaps between urban and rural areas, and uniform labelling and quality testing.
- **Long Term:** This phase involves integrating CUD treatments and data with existing health infrastructure and systems. The side effects of cannabis use onset due to legalisation would witness a decline on a public scale, with a more robust healthcare system for cannabis. The policy evolves

dynamically while aiming to prevent lobbying for cannabis promotion, securing the standing of India's public health model in the global landscape.

IMPLEMENTATION CHALLENGES:

- Building robust surveillance and data gathering systems to track cannabis use and its health impact places a strain on already limited public health resources. This challenge is especially acute in rural areas with little digital integration, where collecting reliable data is more difficult.
- Existing data gaps occur precisely due to inadequacy of such data gathering systems and the stigma and under-reporting with respect to CUD and other psychotic diseases.
- While the aim is to minimise lobbying, it will be a hard task. Past attempts to prevent lobbying by tobacco and alcohol companies have shown unsatisfactory results, and similar attempts for cannabis may also not prove to be fruitful. Cases in developed economies like the US have shown the difficulty of achieving this task.
- Long-term integration of CUD treatment into the public health care system requires sustained funding, and even earmarking cannabis taxes for public health may not prove to be enough.
- Random quality checks and testing require investments into labs, equipments as existing infrastructure may be overburdened. The existing rural-urban divide would lead to public health being worse off in rural areas, which would suffer from higher rates of CUD.
- Identification of different strains and products would require significant preliminary research on the government's behalf, due to which these policy recommendations cannot be considered immediately.

ALIGNMENT WITH INTERNATIONAL FRAMEWORKS:

- India's cannabis policy is set in context under the framework of the Single Convention on Narcotic Drugs (1961), the Convention on Psychotropic Substances (1971), and the Convention Against Illicit Traffic (1988. These agreements limit cannabis consumption to medical and scientific use and allow for industrial uses like fibre and seed. Countries have interpreted these commitments differently, thus causing variation in national cannabis regimes. Alignment of India with the above frameworks is essential for legal consistency and accessing regulated trading and research networks.

POLICY RECOMMENDATIONS:

- Clear legal definitions must be adopted at the national level to separate industrial, medicinal, and controlled uses of cannabis. Definitions must also comply with the treaty language to avoid ambiguities in enforceability and

State rules also have to be harmonised with the central legislation to avoid contradiction. The national reporting procedure for all authorised cannabis activities should be developed. At present, information on cultivation, processing, research use, and exporting is distributed among disparate ministries. Such a consolidation is required to ensure that treaties are accurately complied with and governance is transparent.

- Domestic practice on the cultivation, processing, and testing should be consistent with internationally accepted principles, such as Good Agricultural and Collection Practices and Good Manufacturing Practices. These are standards that are mandatory for exports, and equally necessary for securing safety in domestic supply chains.

SCENARIO ANALYSIS

- **Short Term:** The efforts will concentrate on legal alignment and administrative coordination. Definitions shall be standardised, and reporting forms shall be simplified. Pilot projects will be controlled and monitored for adherence to treaty obligations.
- **Medium Term:** The regulatory institutions will grow to facilitate controlled export movement and research collaboration. Labs and agents for enforcement will learn compliance procedures. International cooperation will grow as reports become more regular and trustworthy.
- **Long Term:** India will be able to take an active part in discussing cannabis regulatory issues in international policy contexts. Stable compliance systems will allow the country to shape future frameworks based on the needs of developing economies and regulated agricultural markets.

IMPLEMENTATION CHALLENGES:

- Even so, coordination across ministries remains a major obstacle. Cannabis regulation combines agriculture, health, revenue, excise, and law enforcement authorities under different mandates. With no coherent mechanisms of coordination, the alignment will be disparate.
- Another issue is technical capability. International compliance relies heavily on reliable testing, traceability and inspection, which are also limited in several states. Uniform implementation requires proper training and infrastructure development.
- Legal interpretation can also be problematic. Treaty provisions are relatively flexible; however, diverging interpretations at the state level entail compliance risks. Uneven adoption in states may hinder convergence. If regulated systems are implemented in some states and a strict prohibition in others, reporting and enforcement on a national scale will remain fragmented.

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CONCLUSION

CONCLUSION

Cannabis regulation in India is indicative of tension between inherited legal frameworks and a new reality. The present structure is the result of historical shifts that replaced indigenous regulatory practices with prohibitionist models shaped by colonial administration and later reinforced through international treaties. With time, this change turned a crop that had been used for some time to complement India's cultural and medicinal systems into an object of illegality despite there being no hard proof that criminalising it would reduce health risks. Such a framework has created a policy environment characterised by ambiguity, uneven enforcement and lost economic and scientific prospects.

The analysis highlights how prohibition hasn't cut down on the use of cannabis, nor has it prevented public health from risk. Instead, it has moved consumption to unregulated markets, where product safety is unknown, and users cannot assess the level of potency and contamination. Aggressive enforcement methods have put disproportionate costs on rural communities and small cultivators, whom r

cannabis has historically been a source of livelihood. Countries that are governed by the same treaties have developed a range of regulatory approaches that focus on public health, research, and controlled access while remaining within the bounds of international conventions. That gradual global movement towards medical and industrial cannabis has allowed for a new way of looking at cannabis, especially after the United Nations' reclassification of cannabis. India's hesitation to engage with this evolving landscape has limited its ability to participate in regulated trade and industrialisation of hemp, even though its climatic conditions and traditional knowledge place it in a strong position to do so.

Regulated cannabis and hemp can foster rural economic development, industrial diversification, and environmental sustainability when policy is designed to regulate and promote agricultural and industrial uses of it. Experiments at the state level in Uttarakhand and Himachal Pradesh have shown promise as well as limits of partial reform. Controlled cultivation may produce income and

mitigate reliance on illicit markets, but regulatory fragmentation and inadequate processing facilities leave farmers unable to gain true benefits from it. Legalisation will potentially have the opposite impact without these types of conscious safeguards. It needs to be sustainable for growth in this area, and hence, regulation should be complemented by cooperative systems, public processing infrastructure, predictable procurement, and access to credit and research support. Taxation, in addition to revenue, is the main reason for reform and needs to be regarded with the same caution. Cannabis comprises all kinds of economic classes: agricultural input, industrial raw material, medicinal resource, psychoactive substance, etc., and is not taxed fairly, which could have a severe impact on incentives. A fiscal system, in consideration of these distinctions, is required. The limitations of the current research environment remain one of the strongest barriers to informed governance. Fragmented institutional mandate, limited approvals and underfunding have obstructed the development of an integrated ecosystem for cannabis research. The policy should essentially integrate agricultural, processing, industrial and medicinal science research. Furthermore, international practice cautions against over-commercialisation that can undermine health goals through high-impact marketing and potent offerings. The institutional constraints of India make early preventive control very important. Regulation must therefore be structured to protect health before market expansion.

Cannabis policy at its greatest level reflects broader questions of governance and equity. The state needs to do all and more to ensure that the legalisation of cannabis for industrial and agricultural purposes will not pose a threat. It cannot be done without protecting farmers and the traditional knowledge of other peoples from being sidelined and biopiracy because of the loss of indigenous cultures of people in agricultural environments. And that would require a fully-resourced regulatory model in which there should be separation between industrial, medicinal, and recreational uses of cannabis. National standards need to be in place, but there should be room for localisation. What kind of policy India moves towards will shape whether cannabis can remain something controversial and, if so, become a regulated industry guided by public interest.

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THE TEAM

RESEARCH AND POLICY DIRECTOR

Kulpreet Kaur

TEAM MEMBERS

Divyae Shah

Tanay Garg

Contact Us

Diksha Debnath
+91-78274-81079
Kulpreet Kaur
+91-79828-39234

www.ecosocsrcc.com

contact@ecosocsrcc.com

THE ECONOMICS SOCIETY

SHRI RAM COLLEGE OF COMMERCE

www.ecosocsrcc.com

contact@ecosocsrcc.com