



GOVERNMENT OF PAKISTAN
CABINET DIVISION
NATIONAL CANNABIS CONTROL AND REGULATORY POLICY –
2025

SECTION-A

1. Overview

The National Cannabis Policy provides the legal roadmap for control and regularization of cannabis industry in the country and aligns itself strictly with the United Nations Single Convention on Narcotics Drugs, 1961; Pakistan being signatory of the Convention. The enabling framework covers across the entire value-chain of cannabis cultivation, extraction, product manufacturing and developing a conducive marketplace within and outside the country only for industrial and pharmaceutical purpose. Use of Cannabis for entertainment purpose will continue to be illegal and shall be dealt with by existing laws of the Country.

A key feature of this policy is to encourage controlled and regulated cultivation of new sites for medicinal and industrial purposes; while bringing historically prevalent cultivation regions, notably 50,000 (approximately) acres of cannabis cultivation in newly merged districts, under legal umbrella. The initiative has significant social value in reducing the illicit drug trafficking and uplifting the socio-economic status of the cultivation region. In addition, the global Industrial and Medicinal Cannabis industry is expected to grow from current US\$ 25 billion to approximately US\$ 134.4 billion by 2030, recording a Cumulative Annual Growth Rate (CAGR) of 25.3%.

As more research into industrial and medicinal cannabis is undertaken, public demand for cannabis derived products continues to rise. So far, more than 50 countries have legalized cultivation and more governments are promoting, commercializing industrial and medicinal cannabis through legislation. Pakistan needs to act swiftly to join this rapidly growing industry while ensuring to align itself with international laws through its own legal framework.

2. Vision

The underlying policy is structured with a vision to promote value-added market through: -

- i. Cultivation and processing of Industrial Cannabis (<0.3% THC; hemp) for use in multiple industries including, but not limited to, textile, construction, paper industry and food sector.
- ii. Refined Medicinal Cannabis (>0.3% THC) oils/ derivatives for prescription-based products to be used in pain management, neurological and other immune-based therapies. The controlled legalization may provide the opportunity to engage academia, pharmaceuticals and clinical researchers to develop local medicines and conduct clinical trials in various disease indications.
- iii. Finally, but not the least, industrial and medicinal cannabis sector will generate tax income for the government, mitigate illicit trafficking of drugs and create thousands of jobs while diversifying the export basket of the country through a legal framework.

3. Objectives of the Policy

This Policy sets out the following objectives: -

- i. To establish a dedicated regulatory Authority, namely Cannabis Control and Regulatory Authority (CCRA), through the act of parliament to oversee all activities related to industrial and medical cannabis's licensing and monitoring including but not limited to: cultivation, extraction, manufacturing, transport, and marketing and sales for medical and therapeutic purposes.
- ii. To reduce illicit trafficking through regularization/ legalization of the prevailing cannabis growing areas in the newly merged districts alongwith the government-controlled extraction and better margin directly to farmers; alleviate poverty, control crime related to illicit drug production and trafficking.
- iii. To address the negative social and health impact of unregulated cannabis, focusing on the reduction of addiction and unsafe use of plant products by establishing state of the Art Drug Rehab Centers in the affected areas.
- iv. To establish a clear regulatory framework, similar to legalization of Morocco's prevalent cannabis cultivation region, to mitigate social harm and generate government revenue through taxation.
- v. To promote the development of regulated, recorded and legal supply chain for industrial and medicinal cannabis regimes including creation of enabling market place for local and export businesses.

- vi. To collect tax at point of sale/ outlet from end consumer which may be re-invested in prevailing cultivation zones for poverty alleviation, education and health etc.
- vii. Provide legitimate employment/ business opportunities to small farmers/ community through Corporate Social Responsibility, especially in the far flung and poverty stricken areas of the Country. Where and when possible and legally correct, incorporate and work in close liaison with legal and well reputed Non-Government organizations to reach out to the local communities for incorporation in national mainstream and local economy while taking due cognizance of local Rivaj, Culture and sensitivities.
- viii. To ensure inclusive participation in the regulated cannabis and industrial hemp economy, the CCRA shall implement mechanisms to accommodate small-scale growers, enabling them to access legal markets, benefit from collective resources, and operate under full regulatory compliance.

4. Goal

One of the tangible goals of this policy is to provide guidelines for the establishment of a regulatory Authority, addressing the complex requirements of domestic and international laws related to; i) cultivation of cannabis; ii) extraction; iii) manufacturing; iv) transport; v) monitoring and reporting; vii) marketing and sales; and viii) export and import of industrial and medicinal products. Due to the multi domain engagement of the proposed initiative, the enabling platform of the Special Investment Facilitation Council (SIFC); shall also be utilized in promoting ease of doing business, more specifically by; a) facilitating timely decision making with proficiency; b) overcoming systemic/ inter-ministerial/ provincial issues; and c) fast tracking of investment and project implementation in a legal and legitimate manner.

SECTION-B

INDUSTRIAL CANNABIS (CANNABIS SATIVA, HEMP)

5. Guidelines and Government's Focus

Industrial cannabis, or hemp, is a sustainable plant with diverse industrial uses. With low THC levels, it is cultivated for fiber, seeds, and extracts, supporting industries like textiles, bioplastics, construction, biofuels, and pharmaceuticals psychotic compound and nutritional uses. Its rapid growth and eco-friendly nature make it a valuable resource for sustainable manufacturing and economic development (International trends on use of industrial cannabis are given at Annex-B for reference purpose).

5.1. It is essential to structure a legitimate framework not only for deriving optimal benefits from the plant but also for improvement in the socio-economic conditions of the area and well-being of its people. It's worth noting that growers and processors face distinct sets of risks, however, risks exclusive to growers could impact the activities of processors, therefore, in an integrated production chain, it is crucial to structure the policy in a manner that it should aim at mitigating any such risks.

5.2. This policy encourages the pharmaceutical/ industrial use of cannabis seed through further research and regulated frameworks for domestic consumptions as well as exports. This policy would also encourage “Whole Plant” approach for the licensed farmers and growers, however, to meet the specific needs of quality and safety for pharmaceuticals/ industrial use, the policy would allow selective farming/ cultivation in close collaboration between farmers and end user pharma/ industries. To this end, licensing must be specific and purpose driven.

5.3. Cannabis paper is known for its durability and tear resistance compared to wood-based paper. It can be recycled more often (7–8 times versus 3–5 times for wood-based paper) and requires less cultivation area than wood beside being environment friendly. Use of cannabis in paper and textile industry should be encouraged and gradually increased to yield better profits and add environment friendliness within the geographic confines of Pakistan.

5.4. Throughout the cultivation and manufacturing processes, the CCRA should benefit from the best international practices and align their regulations, processes and procedures accordingly, while taking due cognizance of Pakistan’s economic, socio-cultural and legal needs.

5.5. The policy encourages research and innovation, promoting the development of new cannabis-based products and technologies through engagement with academia, government research centers and industry. More advanced countries have led to a steady stream of advancements, diversifying the applications of industrial cannabis and bolstering the industry's potential. A close liaison between CCRA, the academia and industry is essential.

5.6. This policy stresses that all medical cannabis-based products must meet pharmaceutical quality standards appropriate to their intended use. Companies producing cannabis-based active pharmaceutical ingredients must obtain “Good Manufacturing Certificates” from CCRA.

5.7. The strongest evidence supports the use of cannabis-based medicines for severe treatment-resistant epilepsy, multiple sclerosis spasticity and certain forms of intractable nausea and vomiting.

5.8. All cannabis cultivation for medical/medicinal purposes must be conducted under controlled indoor conditions with appropriate security conditions, environment controls and comprehensive tracking and monitoring systems.

6. Regulatory Framework for Industrial Cannabis

6.1 Legal Framework for Industrial Cannabis

The details of the framework have been described in Cannabis Control and Regulatory Authority Act, 2024 (Copy of CCRA Act is attached). A broad view is mentioned below.

6.1.1 Licensing and Authorization

Individuals or entities interested in cultivating industrial Cannabis must obtain a license from the Cannabis Control and Regulatory Authority (CCRA). The licensing process shall involve thorough background checks by the Authority and verification of compliance with the stipulated THC limits.

6.1.2 Tracking Land Use

- i. License holders must accurately record and report the land used for Cannabis

cultivation to the Authority.

ii. The Authority shall implement a tracking system to monitor land use and ensure compliance with the designated areas for cannabis growth.

6.1.3 Regular THC Testing

Routine testing of industrial cannabis crop shall be conducted by CCRA to verify THC levels, ensuring compliance with the permissible threshold of less than 0.3%. Laboratories authorized by the Authority shall utilize validated methods for accurate THC quantification/ testing.

6.1.4 Disposal of Non-Compliant Plants

Cannabis crops exceeding the stipulated THC limits shall be promptly and safely disposed-off to prevent misuse or unlawful distribution. Proper documentation of disposal, following established guidelines by the Authority, shall be maintained.

7. Market and Product Regulation

The regulatory framework focuses on following key aspects of the industrial cannabis industry.

7.1 CBD and Derived Products

CBD is a non-psychoactive compound derived from the Cannabis plant that has gained popularity for its therapeutic effects on various health conditions, including pain and inflammation. The World Anti-Doping Agency (WADA) also confirmed that CBD is not prohibited or narcotic substance. This policy encourages the use of synthetic CBD for its vast range of benefits to human health. Processes involved in producing synthetic CBD for use in food supplements and balms for pain management ensure 0% presence of THC levels and thus promote the well-being of the people and has a strong potential to reduce patient load on the national health system. Regulations shall be developed to govern the extraction, processing, and sale of CBD-based products, with a primary emphasis on ensuring consumer safety and accurate product labeling. Additionally, a vigilant monitoring system shall be developed to prevent any unauthorized use of CBD and related compounds in products that do not comply with established standards.

7.2 Industrial Cannabis Fiber and Derived Products

The production and sale of cannabis fiber and its derived products, including textiles, ropes, hempcrete and food products etc., are subject to regulation that shall be

described under rules and regulation of the Cannabis Control and Regulatory Authority Act, 2024. This includes enforcing strict quality standards to uphold the integrity and safety of these products within the market. The regulations aim to foster a secure and thriving industrial cannabis market, benefiting both producers and consumers.

SECTION C

MEDICINAL CANNABIS

8. Guidelines and Government's Focus

Medicinal cannabis refers to the use of cannabis and its compounds, such as CBD and THC, for therapeutic purposes. It is prescribed to manage chronic pain, epilepsy, nausea from chemotherapy, and other medical conditions. With growing research, medicinal cannabis is becoming a recognized alternative treatment in many countries. (International trends on use of medicinal Cannabis are given at Annex-C for reference purpose).

8.1 Legalization of Medicinal Cannabis

Through legalization, the farmer share is expected to increase while setting the stage for the government to collect taxes and provide for quality products. Just as Morocco's government efforts on cannabis legalization was successful, it is anticipated that this policy will bring about a similar transformation, emphasizing social welfare and economic growth, all while upholding legal and regulatory standards. The authority shall maintain close liaison with farmers as well as concerned LEA's to maintain control over illegal activities and mitigate the chances of its illegal use/ drug trafficking.

8.2 Curbing Addiction and Unlawful Use

The regulation of the cannabis industry, as envisioned in this policy, seeks to curtail drug addiction rates and govern the illicit cultivation, supply, consumption of cannabis and restrict the use of cannabis for recreational purposes. Beyond the legal and social requirements, the policy recognizes the promising role of regulated cannabis industry within the medical domain. This includes the development of pharmaceuticals targeting critical health conditions such as cancer and presenting a tangible avenue for positive contributions to the medical sector. However, the use in pharmaceuticals is rather restricted and cost prohibitive for new cannabis- based medicines. This is in contrast to prescription based medical cannabis therapy (in practice in US and Canada using oils, tincture, edibles, concentrates etc.,) and largely popular because of patient's affordability, availability and effectiveness. The pharma/ medicine industry should

be encouraged to carry out further research to harness the benefits of cannabis for health purposes.

8.3 Establishment of a National Cannabis seed Bank to oversee the production of approved strains (Medicinal, Industrial hemp)

The production and sale of Cannabis seeds and its derived products, including Cannabis seed oil, protein-rich supplements, and other derivatives shall be regulated under rules and regulations of Cannabis Control and Regulatory Authority Act, 2024. The focus will be on ensuring the quality and safety of cannabis seed-based products in the market, promoting consumer confidence and fostering a flourishing market for Cannabis-derived nutrition and supplements.

8.4 Approved Cannabis-Based Drugs

Various countries in the world use cannabis derivatives for medicinal use. Some examples are given at Annex-D for reference purpose.

8.4 United Nations Legal Framework for Medicinal Cannabis

United Nations legal and regulatory framework is given at Annex-E for reference purpose as well as to ensure alignment of this policy document strictly with the international practices.

9. Regularization of Existing Cannabis Cultivation Areas in Pakistan.

The broader goal is to ensure that illegal and prevailing cultivation of cannabis is not used in an illegal channel and that cannabis produced in an illicit setting is not introduced into this regulated process. **To this end: -**

- i. The regularization of Cannabis cultivation and processing will only be authorized in certain areas and shall be approved by CCRA through a deliberate licensing regime issued exclusively for the authorized zones.
- ii. All activities related to the cultivation of cannabis, its production, manufacture, transport, marketing as well as its export and import for medical and therapeutic purposes, shall be controlled by Cannabis Control and Regulatory Authority (CCRA).

SECTION-D

ESTABLISHMENT OF CANNABIS CONTROL AND REGULATORY AUTHORITY (CCRA)

10. As per requirement of Article 28, in conjunction with Article 23, of the United Nations Convention on Narcotic Drugs, 1961, an agency, herein called Cannabis Control and Regulatory Authority (CCRA) has been established by Act of Parliament 2024. The Authority shall cater for the complex requirements of domestic and international laws across all activities related to the monitoring, reporting, cultivation, extraction, manufacture, transport, marketing, sales and export for industrial as well as medicinal and therapeutic purposes.

The Cannabis Control and Regulatory Authority (CCRA) will play a pivotal role in overseeing and authorizing activities related to industrial and medicinal cannabis, while paying specific attention to the prevailing cultivation regions. Some of the salient features of the Cannabis Control and Regulatory Authority (CCRA) are:

- i. The headquarters of the Authority shall be at Islamabad and the Authority may set up offices at such places in Pakistan as it may deem fit for the operations and effective discharge of its duties.
- ii. The General administration, supervision and control of the affairs of the Authority shall vest in the Board. The composition, functions and meetings of the board shall be as given in Cannabis Control and Regulatory Authority Act, 2024 and Rules/ Regulations made thereunder.
- iii. Requisite manpower, specialists, consultants, legal experts, business developers, and other officials to run the day to day functions of the authority, shall be hired by the authority.

10.1 Powers and functions of the Authority

The Authority shall have all such powers as may be necessary to perform its duties and functions under Cannabis Control and Regulatory Authority Act, 2024. The Act shall be periodically reviewed, if required, by the Board of Governors for any amendments/modifications and recommend its proposal(s) for any such amendment (s) to the Parliament, for the purpose of improving and refining the Authority's functions, operations and efficiency with a view to keep it relevant to the international best practices, market trends and laws.

10.2 Raising of the Authority

As specified earlier, the Authority shall be located in Islamabad with its regional offices in other parts of the country, as deemed and decided by the authority. Concerned ministry must provide office building at a suitable, safe and secure location within 60 days of the promulgation of CCRA Act, 2024.

10.3 Enforcement and Implementation

Cannabis Control and Regulatory Authority (CCRA) shall enforce and implement this policy in close coordination with Anti-Narcotics Force (ANF), Ministry of interior and Narcotics Control and provincial authorities.

Any violations on part of the authorized Licensees, if observed across the entire spectrum of Pakistan shall be promptly reported to the Authority by ANF, provincial authorities or Authority's regional offices, as the case may be, for initiating legal Proceedings against the violators.

10.4 Manufacturing, sales and Marketing

Existing industrial and medicinal retail outlets in the country shall continue to serve Pakistan's population for their end user needs and shall ensure:

- i. Cannabis based medicines in whole or part thereof can only be provided to the end user/ patient on medical prescription.
- ii. The licensed Pharmaceutical Company can sell such medicines through pharmaceutical outlets throughout Pakistan.
- iii. The types of products may include registered plant extracts (industrial cannabis derived CBD; THC < 0.3%) in cosmetics, edibles, beverages, herbal, pharmaceutical, nutraceutical and other relevant markets and as specified by the Authority.
- iv. Distribution and sales of Medicinal Cannabis (THC > 0.3%) and its derivatives shall take place through outlets, with prescriptions from registered health professionals and doctors for specific medical conditions.
- v. The Business to Consumer (B2C) model shall be applicable including retail outlets for retail distribution of medicinal cannabis products to end users.
- vi. Safe and regulated distribution of medical cannabis products.
- vii. Contributing to the overall well-being of society.
- viii. Source point for the government to collect tax revenues.

10.5 Mandatory Reporting of Cannabis Related Violations to CCRA

- i. If any law enforcement agency, including but not limited to local police, Ministry of Interior, Narcotics Control (ANF), Customs, or any other relevant authority detects any illegal activity related to cannabis or its derivatives, they shall be legally bound to immediately report to CCRA.
- ii. Until CCRA's enforcement division is fully established, it shall register or pursue cases as complainant through the relevant law enforcement agencies, police, FIA, ANF, Customs etc.
- iii. The DG, CCRA shall have the authority to appoint legal representatives to ensure proper case handling with prosecution.
- iv. All enforcement agencies shall be in continuous coordination with CCRA to ensure efficient implementation of government policies on cannabis.
- v. CCRA shall maintain close liaison/ coordination with law enforcement agencies regarding cannabis related cases and enforcement actions.
- vi. The Authority shall have powers to hire as and when hiring is deemed indispensable for the effective functioning of the authority.
- vii. This flexibility ensures that CCRA remains agile, responsive and fully capable of executing its regulatory without unnecessary administrative hurdles.

11. Establishment of Zones

The Authority with the consultation of the provinces may establish dedicated Industrial and Medicinal Cannabis Cultivation and Processing Areas in each province including Administered Gilgit Baltistan and Azad Jammu and Kashmir, as deemed and approved by the CCRA.

12. Licensing Regime

Licenses shall be issued in accordance with Cannabis Control and Regulatory Authority Act, 2024, and as per international obligations under the UN Conventions. Furthermore, all approval of licensing shall be subject to clearance by the National intelligence agencies (IB; Intelligence Bureau, ISI; Inter-Services Intelligence and ANF; Anti-Narcotics Force). Requirements/ proforma for clearance of applicant companies or individuals shall be shared with concerned agencies by the CCRA.

13. Establishment of National THC Determination and Testing Laboratory

- i. To ensure strict quality assurance, product integrity, and regulatory conformity with global benchmarks, the Cannabis Control and Regulatory Authority (CCRA) shall establish an International Standard THC Determination and Testing Laboratory under its direct administrative and technical control.
- ii. This laboratory shall operate in alignment with ISO/IEC 17025, WHO, and UNODC analytical protocols, serving as the central reference facility for all cannabis, hemp, and cannabinoid-based products in Pakistan. The certification and testing clearance issued by the CCRA Laboratory shall be mandatory for all categories of licensees, including cultivators, processors, manufacturers, and exporters.
- iii. No product whether derived from cannabis, hemp, synthetic CBD, or their derivatives shall be eligible for export, commercialization, or further processing without prior certification from the CCRA Laboratory.
- iv. The CCRA may, where deemed necessary, establish subsidiary or regional testing facilities or enter into government, public, or private partnerships for enhanced technical capacity and international accreditation, while maintaining exclusive regulatory control to ensure accuracy, transparency, and compliance with national and international standards.

14. Land and Cultivation Requirement

The land requirement along with the criteria for issuance of licenses for cultivation etc., shall be defined by the Authority.

15. Incentives for the Licensees

- i. All local growers, processors, retailer etc., in medical cannabis regime shall benefit from competitive market promoting incentives (such as restriction on the import of CBD/THC raw materials or finished products) and shall be defined by the Authority in a graduated manner of time, consequent to development of Industrial and medicinal cultivation, production and manufacturing within the country.
- ii. The Authority would work with Revenue Division for further facilitation and progressive tax regime for the industrial and medical cannabis sector.
- iii. Other incentives may be given as per government rules, regulations and policies.

16. Cannabis Licensing Fee Policy

- i. There shall be a licensing and processing fee to be specified by the Authority, including a security deposit/ fee.
- ii. Finances generated shall be utilized for self-sustainment, research and welfare purpose.
- iii. Fee shall be charged in USD due to international market (less existing small farmers) and considered for equivalent in PKR for the first 1-2 yrs to provide incentives & enable/ help establish the market.
- iv. Licensing fee shall be categorized based on the business scales.
- v. Licensing fee must be paid in full at the time of application.
- vi. If license is revoked due to violations, the security deposit will be forfeited and additional penalty will be applied, as deemed appropriate by the Authority.

17. Dispute Resolution

The Authority shall prescribe a legally binding and enforceable alternate dispute resolution mechanism. The authority has mandate to constitute different forums e.g. CDC (complaint disposal committee) or appellate committee.

18. Public Awareness and Media Collaboration

The Authority shall, in collaboration with the Ministry of Information and Broadcasting, develop and maintain a long-term public awareness and communication strategy aimed at educating, sensitizing, and responsibly informing the public regarding the lawful, medicinal, industrial, and economic dimensions of cannabis. This collaboration shall not be limited to campaign-based interventions but shall evolve into a sustained, institutional partnership between the CCRA and the Ministry for continuous public engagement, awareness dissemination, and confidence-building at the national and community level.

19. Institutionalization of Consultative Framework

The Authority shall work in close coordination with the Ministry of National Health Services, Regulations & Coordination (MoNHSR&C), the Ministry of Science and Technology (MoST), and Ministry of Climate Change to ensure that all cannabis-based medicinal, therapeutic, industrial, and pharmaceutical initiatives conform to national health policies, scientific standards, and ethical benchmarks. The Authority shall institutionalize a consultative framework with the

aforementioned Ministries and their recommended departments to promote regulatory harmonization, coordinated research, and evidence based policy alignment. The scope of this engagement shall extend beyond the Pakistan Pharmaceutical Manufacturers Association (PPMA) and Pakistan Pharmacists Association, encompassing industrial, medical, and research stakeholders, including but not limited to the All Pakistan Textile Mills Association (APTMA), Drug Regulatory Authority of Pakistan (DRAP), medical universities, and public and private credible research institutions. The views, inputs, and technical recommendations of these bodies shall be formally presented for consideration before the Board of Governors (BoG) of the Authority, ensuring that the policymaking process remains participatory, transparent, and aligned with both national priorities and international best practices.

Glossary

1. Glossary of Terms used in this Policy.

- i. **“Act”**: Cannabis Control and Regulatory Authority Act, 2024.
- ii. **“Authority”**: Cannabis Control and Regulatory Authority (CCRA);
- iii. **“Cannabis”**:
 - a. cannabis resin that is, the separated resin, whether crude or purified, obtained from the cannabis plant and also includes concentrated preparation and resin known as hashish oil or liquid hashish;
 - b. the flowering or fruiting tops of the cannabis plant excluding the seed and leaves when not accompanied by the tops from which the resin has not been extracted, by whatever name they may be designated or known and include all forms known as bhang, siddhi or ganja; and
 - c. any mixture with or without neutral materials of any of the above forms of cannabis or any drink prepared therefrom;
- iv. **“Cannabis plant”**: A plant of cannabaceae family including cannabis sativa, cannabis indica and cannabis ruderalis. The cannabis plant has number of active ingredients which are collectively called Cannabinoids including but not limited to;
 - a. Cannabidiol (CBD)
 - b. Tetra-Hydro Cannabinol (THC)
- v. **“Cannabis resin”**: The separated resin, whether crude or purified, obtained from the cannabis plant;
- vi. **“CBD”**: Cannabidiol, a non-psychoactive cannabinoid found in the cannabis plant;
- vii. **“Cultivation”**: The cultivation of the cannabis plant or seeds for commercial, medical or industrial purposes or any other purpose as defined by the Federal Government from time to time;
- viii. **“Community”** A group of individuals legally involved / permitted to farm, cultivate or store Cannabis plant living in specified zones for Cannabis cultivation in Pakistan.
- ix. **“CSR (Corporate Social Responsibility)”**:
- x. **“Data”**: Representations of information in any form across the entire value chain of industrial and medicinal cannabis;

- xi. **“Derivative”**: Means any derivative of the cannabis plant, whether natural or synthetic, and includes derivatives which are directly or indirectly manufactured from any part of the cannabis plant for use in other industries, such as textile industry, pharmaceutical industry, food industry, construction industry, chemical industry, etc. or any other industry as defined by the Federal Government from time to time;
- xii. **“Drug Regulatory Authority of Pakistan” or “DRAP”**: The Drug Regulatory Authority of Pakistan established under the Drug Regulatory Authority of Pakistan Act, 2012 (XXI of 2012);
- xiii. **“Grain”**: Achene of industrial cannabis/hemp that is not represented, sold or used to grow a plant;
- xiv. **“Hemp”**: Variant of cannabis plant with THC less than 0.3%;
- xv. **“Laboratory”**: Laboratory only notified by Cannabis Control and Regulatory Authority (CCRA) for testing and analysis of industrial and medicinal cannabis and their derivatives;
- xvi. **“License”**: A license issued under Cannabis Control and Regulatory Authority Act, 2024 in relation to industrial and medicinal cannabis;
- xvii. **“Licensee”**: A holder of a license;
- xviii. **“NGOs”**: Non-Governmental Organization.
- xix. **“Person”**: Any natural or legal person;
- xx. **“Place”**: Any land (whether vacant, enclosed or built upon, or not), and any premises;
- xxi. **“Plant”**: Flowering heads, leaves, branches, seed, grain or fiber, as the case may be
- xxii. **“Preparation”**: A solution or mixture, in whatever physical state, containing industrial and cannabis or their derivatives;
- xxiii. **“Record”**: Any material on which data is recorded or marked and which is capable of being read or understood by a person, computer system or other devices;
- xxiv. **“Regulated Activity”**: Any activity in relation to the cultivation, producing, manufacture, product development and sale of cannabis plant or any of its parts or derivatives, for any purpose, and includes activities which are licensed and any other activity which may be regulated by rules;

- xxv. **“Regulation”**: Regulations made under the Act;
- xxvi. **“Retail Outlet”**: Licensed outlets and point of sale authorized by the Authority for sales and commercialization of industrial (THC<0.3%) and its derivatives and medical cannabis (THC>0.3%) and its derivatives;
- xxvii. **“Seed”**: Achene of industrial cannabis that is represented, sold or used to grow a plant (grain)
- xxviii. **“Supply”**: Includes sale, consignment, dispatch, transport, delivery, distribution, dispensing as well as offer to supply; and
- xxix. **“THC”**: Tetrahydro-cannabinol, the principle psychoactive constituent (or cannabinoid) of the cannabis plant.
- xxx. **“Welfare”**: well-being and financial support of employees and of community.

INDUSTRIAL CANNABIS**1. Overview**

Industrial Cannabis, a cultivar of Cannabis Sativa, contains less than 0.3% THC and a higher content of CBD. It is primarily utilized in industries such as textiles, construction materials, and food products. The Global Industrial Cannabis/Hemp Market was valued at USD 5.66 Billion in 2020 and is projected to reach USD 23.72 Billion by 2030, growing at a CAGR of 25.17%. Industrial cannabis cultivation promotes renewable agriculture, require minimal pesticides and synthetic fertilizers; making it an environment friendly choice. Its rapid growth and deep roots prevent soil erosion, and remarkably, efficient carbon-sequestering plant, aiding in mitigating climate change by absorbing substantial amounts of carbon dioxide during its growth.

There are several utilizations of industrial cannabis as a raw material. It can be transformed into various products including:

- i. premium textiles, paper, biodegradable plastics, and insulation building materials, reducing our dependence on imports of raw cannabis/hemp fiber.
- ii. cannabis seeds, highly nutritious and packed with essential fatty acids, vitamins, and minerals, and offer a sustainable import substitution of edible oils.
- iii. cannabis-derived medicinal products, particularly CBD, showcases potential therapeutic properties, promising relief for various medical conditions.

There are significant technical and regulatory challenges throughout the production process, particularly when transitioning from processed or semi-processed CBD based products to those aimed at nutraceutical, nutritional, and cosmetic markets.

It's worth noting that growers and processors face distinct sets of risks, however, risks exclusive to growers could impact the activities of processors, therefore, an integrated production chain is essential.

1.1 Industrial Cannabis Cultivation, Processing and Value Addition

Cannabis sativa L. plants can be grown using three primary methods: outdoor, indoor, and in greenhouses. The choice of cultivation method is closely linked to the intended use of the plant. Outdoor cultivation, which is the most natural approach, is predominantly associated with fiber and seed production. In contrast, indoor and greenhouse methods are typically preferred for cultivating cannabis with a focus on CBD.

Outdoor cultivation is significantly more energy-efficient than indoor and greenhouse cultivation, using approximately 15 times less energy per gram of dry flower compared to indoor methods and about 10 times less than greenhouse production. It also produces substantially fewer carbon emissions, with indoor cultivation generating nearly 25 times more CO₂ per gram than outdoor cultivation.

Despite these advantages, outdoor cultivation presents unique challenges. It is vulnerable to environmental factors such as wind, hail, drought, and pests, which can increase plant stress and potentially raise THC levels beyond legal limits, risking regulatory violations and crop destruction. Additionally, the open environment increases the risk of cross-pollination between different cannabis varieties grown for diverse purposes in the same area.

In contrast, indoor cultivation allows for precise control over environmental conditions, ensuring standardized processes and consistent product quality. This controlled environment makes indoor cultivation the preferred method for CBD-based medical applications where the isolation of specific compounds is essential.

Industrial cannabis/ hemp, is a highly versatile plant with every part—from roots to leaves—serving various industries. Globally, more than 25,000 cannabis-based products have been identified, reflecting the plant's vast potential to produce food, animal feed, cosmetics, biomaterials, and energy.

Transforming raw hemp into final products requires specialized processes that combine labor, capital, expertise, and advanced technological methods. These processes are tailored to the intended end use, highlighting the close connection between the production system and the final product. The type of processing equipment used varies depending on the product being manufactured.

Additionally, many product-level processes require skilled workers to be located near cultivation sites to maintain the integrity and quality of raw materials produced at the system level. This integration of cultivation, processing, and expertise is essential for maximizing the plant's value across diverse industries.

1.2 Products / Derivatives of Industrial Cannabis Fiber

Male and female cannabis plants are used for fiber production, with a preference for males. Late-flowering cultivars maximize stem yield. fiber is extracted through methods like dew and water retting, though these are labor-intensive. Mechanical decortication is more suitable for large-scale operations.

Fine fibers are produced through chemical and physical degumming, which dissolves gum substances between fibers. While techniques like steam explosion and ultrasound improve efficiency, they are costly. Controlled biological degumming using microorganisms and enzymes is a more economical alternative.

Cannabis fibers are used in yarn and fabric production. Wet spinning produces finer yarn, while dry spinning yields coarser yarn. Short fibers are used in high-quality papers, including cigarette papers, heavy-duty cardboard, food packaging, sanitary products, and filtration materials.

Cannabis hurd, a by-product of fiber extraction, are used for animal bedding and mulch. New applications include carbon nano-sheets, plastics, fiberglass alternatives, 3D printer filaments, oil absorbents, insulation materials, and construction concrete. Hempcrete, a mix of herds and lime, is valued for its insulation properties and easy fabrication.

1.3 Products / Derivatives of Industrial Cannabis Seed

Industrial Cannabis Seeds boast a composition of around 28-30 percent protein, 25 percent starch, and 30 percent oil. Consequently, cannabis seeds find a multitude of uses, including being employed as ingredients in cooking oils, dairy products, and flour. These seeds are nutritionally well-balanced and serve as a dependable source of protein for both food products and animal feed.

In seed crop cultivation, the preferred approach is to have a predominantly female plant population, with a limited number of male plants for pollination, or to use monoecious varieties to maximize seed yield. Seed cultivars typically exhibit characteristics such as short stalks, large seed heads, and higher branch density, which distinguish them from fiber cultivars that have long stalks and minimal branching. Different genotypes necessitate variations in the cultivation methods between cannabis grown for seed and cannabis cultivated for fiber.

Plants intended for seed production are typically sown at a relatively low density, with a maximum of 1,000 to 1,500 plants per acre, in contrast to up to 40,000 plants per acre for fiber production. cannabis seeds are harvested when approximately 70-75 percent of the seeds are ripe. Delaying seed collection beyond the optimal harvest time can result in lower grain quality and losses due to shattering and bird damage under certain conditions. Cannabis grown for seed production is usually ready for harvest 100 to 120 days after sowing the seeds.

Various techniques are applied for cleaning, including mechanical screening through sieving, grading, and gravity separation. When used in food products, Industrial Cannabis seeds go through a dehulling process, either manually or mechanically, to remove the outer shells, preserving the quality and integrity of the inner seeds. Subsequently, cannabis seed oil (<0.3% THC) can be primarily extracted through mechanical pressing. The purity of the inner product determines the marketability of oilseed plants, making cross-pollination with other genotypes potentially detrimental to the crop's value.

Cold-pressed seeds contain carbohydrates, dietary fiber, vitamins, and trace elements. Due to the ideal combination of amino acids, oils, and fatty acids, they are considered a super food. The oil derived from crushed cannabis seeds is rich in polyunsaturated fatty acids, with an appealing omega-6 to omega-3 lipid ratio, making it a valuable addition to human and animal diets. This oil also finds use in a variety of products, including soaps, shampoos, lotions, bath gels, cosmetics, and even fuels.

Industrial Cannabis cake, a residual by-product, can be utilized to produce protein powder. This powder is employed in the production of protein-rich animal feed and powdered food supplements, which can be added to items like bread and beer. Cannabis protein powder is typically milled and screened to separate the finer powder component from the coarser fiber constituents.

1.4 Products / Derivatives of Dual-Purpose Cannabis Cultivation

Industrial Cannabis has been cultivated for both its seeds and fibers in a dual-purpose approach. The harvest for dual-purpose cannabis typically begins when the seeds are nearing maturity. From a practical standpoint, the seeds can be collected first, followed by cutting the stalks in a subsequent phase. Modifications to combines allow for the simultaneous harvest of both seeds and stalks.

There is potential for dual-purpose cultivation where both seed and fiber growers could utilize the flowering and fruiting tops of their plants for extraction. A dual-purpose cultivation approach, more suitable for certain climatic and environmental conditions, involves cultivating cannabis for both fibers and its flowering and fruiting tops.

However, if late flowering cultivars are used to achieve high stem yields, this may result in lower seed yields. To increase seed yields, postponing the harvest until seeds reach maturity is necessary, but it could impact stem yield due to factors like the accumulation of secondary fibre and xylem or biological aging. While this can have positive effects on fiber content and

yield, it might lead to an undesirable increase in lignified fiber, which is unsuitable for textile applications.

Adopting a comprehensive whole-plant industrial strategy holds the potential to ensure a consistent supply of high-quality inputs for processors and allows for integrated risk management across the entire production chain. In regions, like Pakistan, with inter-tropical climates, the whole-plant approach may be performed due to favorable botanical and environmental conditions. The choice of plant variety also plays a crucial role in determining the viability of the whole-plant approach, as many European varieties are currently tailored for single purposes, even though all parts of the plant could be utilized when processed.

MEDICINAL CANNABIS

1. Overview

Medicinal Cannabis, is a pre-dominant cultivar of the Cannabis Indica plant with THC content greater than 0.3%, making it psychoactive and medically valuable. Unlike industrial cannabis, which is primarily for industrial use, medicinal cannabis is used for various therapies, particularly in pain management and neurological treatments.

1.1 Global Model for Regularization of Existing Cannabis Cultivation

A significant number of people are involved in traditional illicit cannabis production in countries such as Mexico, India, Afghanistan, Lebanon, Morocco and Thailand. These people solely depend on the earnings made through this cultivation. Morocco, the largest global producer of cannabis resin, has approved a regulatory framework for the legalization of cannabis grown in Rif region. This policy is aimed at the regulation of the existing cannabis market with the objective to reduce the associated social ills and ensure significant government revenue through taxation. The market size of Morocco's illicit cannabis trade is estimated at \$15 billion and the profits mainly flow to organized crime groups and drug traffickers. During the illegal status of cannabis, farmers earn around 4.5% (\$0.5 billion), while drug traffickers earn nearly 95% of the market share (\$14.5 billion).

1.2 Social and Health Impact of Unregulated Medicinal Cannabis

The unregulated nature of the cannabis industry has harmful societal implications. This includes a substantial number of individuals succumbing to cannabis addiction, reaching an estimated figure of approximately six million within Pakistan. Recent study has shown that Karachi is the world second largest consumer of cannabis, with a recorded consumption of 41.5 metric tons. This widespread occurrence highlights the pressing need to promptly address the root cause of drug trafficking while providing for the controlled medical cannabis regime through a well-defined legal and regulatory framework.

1.3 Opportunities and Challenges of Medicinal Cannabis in Pharmaceuticals

Medicinal cannabis refers to the use of cannabis and its active compounds for therapeutic purposes. The primary active compounds in cannabis are cannabinoids, such as tetrahydrocannabinol (THC) and cannabidiol (CBD), which interact with the body's endocannabinoid system to produce various effects. Pakistan with a population of 240 million,

imports, 90% of its pharmaceutical raw material for medicines. The prospect for indigenized production, formulation and prescription of medicinal cannabis-based medicines, for a breadth of diseases, is attractive and may offer potential savings in foreign exchange

1.4 Other Uses of Medicinal Cannabis

Following are some examples of cannabis-based medicines, used for various illnesses, however, the academia and pharmaceutical industry is encouraged to carryout a more wholesome research and analysis and the consequent medicine development in this regard.

i. Pain management

Cannabis is commonly used for pain relief, especially in chronic conditions such as neuropathic pain, arthritis, and multiple sclerosis. Both THC and CBD have analgesic properties that can help alleviate pain.

ii. Nausea and vomiting

Cannabis has shown effectiveness in reducing nausea and vomiting, particularly in cancer patients undergoing chemotherapy or individuals with conditions like AIDS.

iii. Appetite stimulation

Cannabis can stimulate appetite, making it useful for people with loss of appetite due to medical conditions like cancer or HIV/AIDS. This effect is often referred to as "the munchies."

iv. Muscle spasms and spasticity

Cannabis has muscle relaxant properties that can help reduce muscle spasms and spasticity associated with conditions like multiple sclerosis (MS).

v. Anxiety and depression

Some individuals find relief from symptoms of anxiety and depression with the use of cannabis. However, the effects can vary, and in some cases, high THC levels may exacerbate anxiety.

vi. Sleep disorders

Cannabis can have sedative effects and may help individuals with insomnia or other sleep disorders improve their sleep quality.

vii. Glaucoma

Cannabis has been used to reduce intraocular pressure in glaucoma patients, which can help slow down the progression of the disease. However, other more effective treatments are usually preferred.