



Western Cape
Government

Agriculture

FOR YOU



Western Cape CanPlan Literature Review

Framework and Implementation Plan (CanPlan) for the agricultural sector

Literature review

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Prepared by



In partnership with
Ignited Unlimited

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1 Introduction and purpose

This document provides a summary of key issues emerging from the review of literature, data, legislation and regulation. In line with the project team's proposal, the objectives of this step are:

- To consolidate existing research, local and global literature on cannabis market, cannabis industry development approaches, relevant agri-processing value chains, certification trends, competitors etc.
- To conduct an initial review of relevant regulation and legislation

The document is structured around some of the key questions for the project set out in the Terms of Reference where literature and regulatory review can start to shed some light, as well as other questions that have emerged during the research. Implications, hypotheses and remaining questions are drawn out for further investigation during the remainder of the project.

2 What do we know about growing conditions and suitability?

Overview of growing conditions for cannabis and hemp

Cannabis and hemp have different growing requirements, and the requirements of different varieties or cultivar may also vary somewhat.

Cannabis for medicinal use is typically grown in highly controlled conditions (typically indoors), in a cultivation medium or hydroponically rather than in soil, with clones and exactly measured inputs of water, nutrients, temperature, humidity, light etc to provide a standardised output. Flower can be ready for harvesting in 120 to 150 days from seed.

Hemp is typically grown as a field crop, from seed, with plant spacing up to 50 to 200 plants per sqm, depending on the cultivar and end use. It is possible to grow hemp organically and with biological pest control, and with hand harvesting¹. Production for fibre can be ready for harvesting in 90 days, and for seed typically in 120 days.

Optimal growing conditions are summarised in the table below.

Table 1: Typical optimal growing conditions for cannabis and hemp

Growing factor	Cannabis	Industrial hemp
Annual rainfall required	800mm+, mostly under irrigation	650mm+
Required timing of rainfall	October to March	October to March
Humidity	Vegetative 60%, Flower 40%	Early 50%, Ripening 30%
Temperature	26C average	20 – 28C mean daytime max
Hours of sunlight	Vegetative 18, Flower 12	Vegetative 16+, Flower 12
Soil	Ph 5,8 – 6,2, mostly soilless production	Ph 6,0 – 6,8 Loam, good drainage

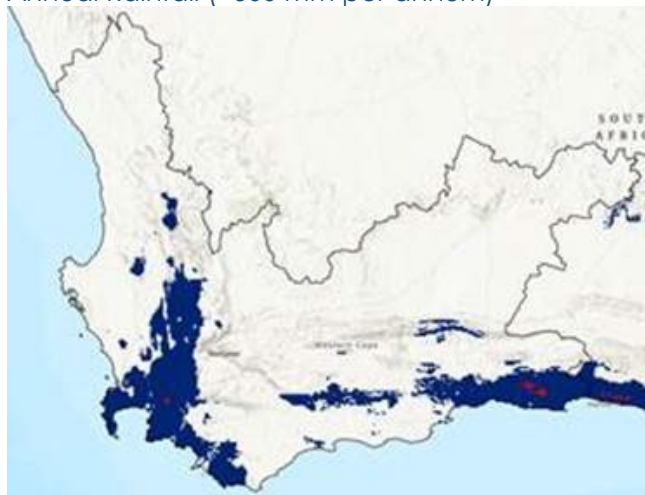
¹ <https://www.farmersweekly.co.za/agri-business/agribusinesses/growing-hemp-sa-takes-a-step-closer-to-commercial-cultivation/>

Assessment of suitability of growing conditions in the Western Cape:

The Western Cape Department of Agriculture GIS unit recently completed an initial GIS analysis of suitable locations based on some of the key factors, using slightly different parameters from the table above, e.g. >500mm to 700mm rainfall, ideal 19-25°C, but this analysis is still directionally useful.

The GIS unit's analysis of **rainfall** was that "no area in the Western Cape receives more than 500 mm of rain during the Summer (October to March). Dry land production will not be possible. Production will be in competition with other crops (food & fodder) for irrigation water."

Annual Rainfall (>500 mm per annum)



The Smart Agri Updated Climate Change Trends and Projections for the Western Cape notes that projections **indicate further drying is likely**.

In terms of **mean temperature**, whilst during the November to February months many locations meet the daytime temperature requirements, in October temperatures are cooler than required, as per the map below. In most cases, higher temperature areas do not overlap with higher rainfall areas, and the GIS analysis indicates some higher rainfall areas are within mountainous and protected areas of the province.

Western Cape, October locations with mean temperature 19-25°C



The Smart Agri Updated Climate Change Trends and Projections for the Western Cape shows scenarios of warming between 0.8°C average warming through to as high as 1.6°C warming, with interior summer rainfall regions experiencing the greatest warming, which therefore likely would not overlap with higher rainfall zones.

The GIS analysis showed that most areas of the province are frost free during the October to March growing period. Day length data is not available on the GIS system, and soil data is highly localised.

What are possibilities of future varieties improving suitability?

Further research and development would be needed to identify suitable traits through the acceleration that appropriate technologies could bring. Once stabilised, the resultant varieties would need to be registered and rapidly multiplied to be released to farmers in the province through a streamlined process. This research could cover both an adaptation of northern hemisphere varieties as well as the development of local strains. Future research on the suitability of hemp as a winter grain crop could also be beneficial.

Potential implications, hypotheses and remaining questions:

Growing conditions in the Western Cape are not optimal for existing cultivars of either hemp or cannabis without a modified environment (irrigation in the case of hemp, and greenhouse production in the case of cannabis). Sub-optimal growing conditions will mean higher input costs compared to producers in optimal locations, with irrigation essential in most areas. The Southern Cape is the only area in the Western Cape somewhat suited to dryland hemp production, although there is still a rainfall shortfall. This is likely to impact the competitiveness of production relative to locations that have optimal growing conditions. The water scarcity pressures in the province, and competition with other irrigated crops, may mitigate against irrigated production. Nevertheless, many of the current irrigation areas in the province could be suitable for hemp production, if the cost of irrigation can be off-set by on-farm value-add or the production of a high value product. There could be some potential of hemp as a rotational crop given the soil improvement characteristics and environmental benefits, as well as potential as compost and animal feed (see value chain section).

A comparator example is the production of fodder and silage by the dairy industry which is usually irrigated in the Western Cape. Lessons could also be taken from the Western Cape still managing to be competitive in other intensive farming such as berries and vegetables.

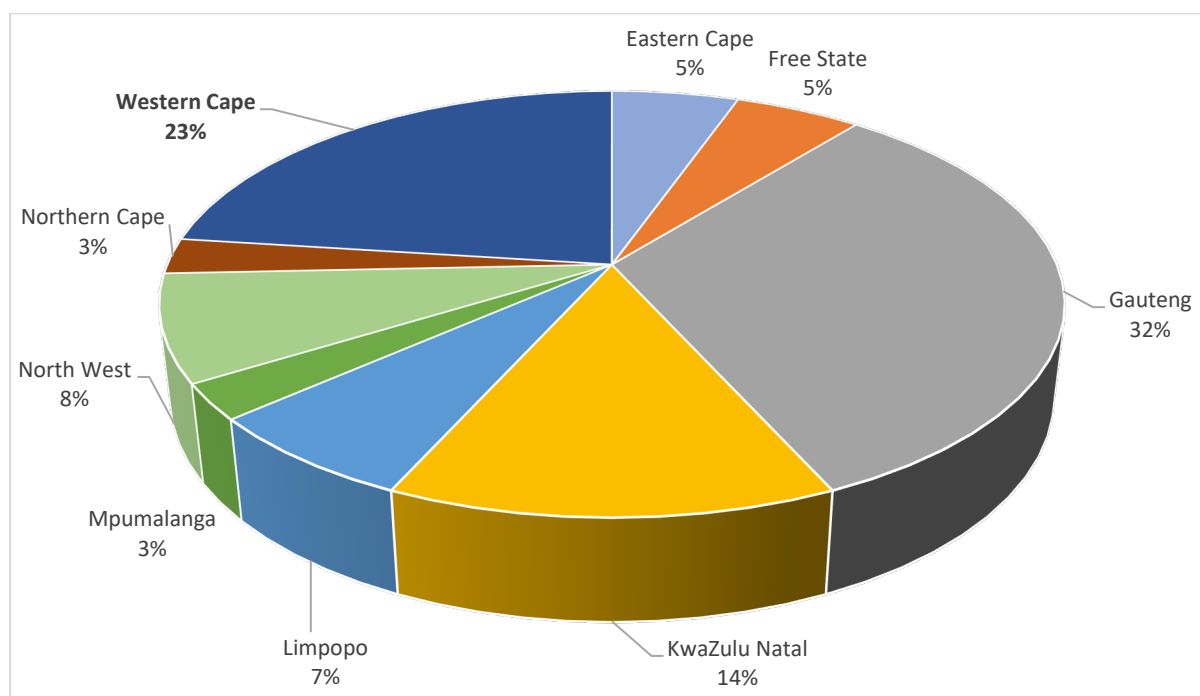
Lower mean day temperature as well as the frequency of overcast conditions can be limiting factors and further research is needed. Lessons could potentially be learned from hops farmers in the Waboomskraal and George area, as hops and Cannabis are closely related. Questions also remain around whether future genetic improvements or strains may widen the suitable growing conditions e.g. lower water requirements or temperature requirements.

3 What do we know about what is already happening in the Western Cape?

This section covers available information on cannabis licensing and hemp permitting, production and processing activity on the ground, as well as planned investments.

3.1 Cannabis and hemp licenses and permits

An analysis of the **cannabis production licenses** based on the list available on the SAHPRA website as at October 2022², shows that the Western Cape now has 17 licenses, which equates to 23% of total licenses in South Africa.



Within the Western Cape, licenses are spread across the West Coast, Boland, Metro, Overberg, and Klein Karoo, with possibly a bigger concentration in the Cape Winelands.

In terms of hemp permits, latest publicly available information is that there are now 11 permits in the Western Cape, and over 300 permits nationally. These permits are spread throughout the Western Cape.

3.2 Where is primary production already happening?

Traditional primary production of **cannabis** in the Western Cape is not at the scale of those provinces with a long history of small farmer such as Pondoland in the Eastern Cape and KZN, where it is estimate that there are around 900 000 small-scale growers³. In the Western Cape, traditional communities do nevertheless grow for own-use and subsistence in all areas of the Province, with the West Coast, towns

² <https://www.sahpra.org.za/cannabis-cultivation-licences/>

³ <https://www.bbc.com/news/world-africa-62524501>

throughout the Cape Winelands and the Southern Cape being the best-known areas for the production of lower grade dagga for the mass adult use market. Localised adaptations abound and growers will go to great lengths to acquire better genetics. Land races are seen as inferior in many ways and traditional growers don't see the value in preserving it, except for a few traditional healers that grow it for compounding purposes.

Other growers have found a market through the private Cannabis club system and growing (often illegal) is happening throughout the province, mostly under controlled conditions and concentrated around the bigger metros.

Commercial growing and growing for research purposes by licensed companies and public research institutions has started, including:

- Felbridge (14,000 sqm hydroponic facility)
- Neopharm (400sqm facility)
- Chronico
- Beyond Buds
- White Lion
- Uncle Rooneys
- Atlantis facility
- Bien Donné research cultivation
- ARC research cultivation
- Drakenstein Municipality / Mike Mangena research cultivation

There is a divide between the often-high quality of genetics available on the informal market and the genetic material available for commercial production. There has been a lack of collaborative research in the past between the informal and commercial parts of the industry. Genetic mapping services and development is available should sufficient budgetary support be found.

Hemp was grown in previous seasons in the West Coast, Winelands, Southern Cape and Klein Karoo, with varying levels of success and mostly under irrigation. Most existing hemp growers have applied for hemp permits through DALRRD. Pilot dryland production of hemp is taking place in the Southern Cape.

3.3 What processing is already happening in the Western Cape?

A range of processing activity in the Western Cape is evident based on publicly available information.

Cannabis processing

Afriplex is already producing and exports medical cannabis extracts⁴, leveraging their capability in processing a range of medicinal plants and natural products extracts and APIs.

⁴ <https://afriplex.co.za/afriplex-exports-first-locally-produced-cannabis-extract/>

GES Labs provides specialist processing of cannabis active pharmaceutical ingredients on a private label basis, and is already working with a range of local primary producers and universities⁵.

SAHPRA is now allowing on-farm processing for research purposes for licensed growers.

Industrial hemp related processing

Hemporium produces a wide range of **clothes, accessories and other hemp cord or textile-based products** based on imported fabrics, rope and cord.

Afrimat⁶ is producing **hempcrete and hempcrete blocks** in a brick-making facility, using local lime and mostly imported hemp hurd, and they had used some inputs from the hemp pilot projects with a small-scale decorticator. They are currently supplying the construction of the "Hemp Hotel" in Cape Town. There is also some pilot production of hemp fibreboard panels.

There are various **hemp foods** being processed and packaged based on imported raw materials and hemp seeds e.g. Health Connection, Soaring Free, Real Food Co. Animal and pet foods with hemp-based ingredients are also being produced in the province.

Various companies are also already producing a range of products in the province with **hemp oil ingredients and CBD** (some with low CBD levels)– ranging across oils, skincare and personal care, food, waters, honeys, sweets, alcoholic and non-alcoholic beverages, teas. The previous round of hemp permits issued by SAHPRA were administered through the Cannabis Development Council of SA. This made the process inclusive, with good representation from traditional communities and hemp enthusiasts alike. Many growers assumed wider definitions of hemp and lack of enforcement has created a framework for the marketing of non-compliant products. These products include cosmetics, personal hygiene, natural medicine, food and pet health. Products are supplied through online stores, farmers markets, boutique shops and private clubs.

SARS postal code import data gives some sense of existing related imports, although as shown in the market and competitor section, the HS codes do not cover all relevant trade and it is not always possible to isolate hemp or cannabis specific trade.

⁵ <https://geslabs.com/>

⁶ <https://www.afrimathemp.co.za/hempcrete-and-blocks/>

HS Code	Description	2022 value (ZAR)	2022 volume (kg)	2021 value (ZAR)	2021 volume (kg)
12079900	Oil seeds	15 379 573	284 052	13 595 162	305 090
13019000	Lac; natural gums, resins, gum-resins, balsams and other natural oleoresins	6 746 409	26 749	6 787 116	28 819
121190	Plants, parts of plants, incl. seeds and fruits, used primarily in perfumery, in pharmacy or for insecticidal, fungicidal or similar purposes	11 589 229	294 019	14 087 925	231 357
53082000	Hemp yarn	31 215	103	2 109	90
53029000	True hemp ""Cannabis sativa L."" , raw or	3 165	3	672 058	45 539
Total		33 718 376	604 824	42 824 838	803 897

Source: Project team analysis of SARS Trade data

3.4 What related services are already taking place in the W Cape?

In addition to the locally processed goods, a vast range of cannabis and hemp value chain products are retailed in the Western Cape, many of which are imported and fall within a regulatory grey space. Various challenges are currently in the courts to challenge the jurisdiction of SAHPRA on this.

The home grower market is supported by a range of auxiliary services and there are now Cannabis grow shops in most towns. Most commercial garden centres also support the industry, often with dedicated Cannabis sections. Online retail is also emerging.

There are also a range of other cannabis value chain services, including **lab services** and **analytics** such as Qure, Eco Green, and Vinlab, with various existing labs adding cannabis related lab services to their portfolio. There are also companies focusing on **biotechnology development, consultancy and value chain development** e.g. Limitless Reality. **Legal services** companies are also developing specialisation in cannabis law. There is also an architectural firm specialising in hemp architecture (Wolf & Wolf Architects).

In terms of R&D, top academic institutions are showing an interest in hemp. International genetic focused companies have expanded into South Africa, with one example Puregene represented in the Western Cape. Currently PhD research into fibre and flower quality are being done through University of Stellenbosch. The hemp research farm in Simondium cooperating with academic and research institutions to establish a platform for collaborative research. Projects include fibre and animal feed research through University of Stellenbosch as well as adaptability trials for the ARC.

A range of **education and training** services are already available in the Western Cape, such as Cheeba Academy (dedicated cannabis academy) and Medical Cannabis courses for health professionals (Sustainability Institute and Happy by Nature).

Cannabis tourism and the promotion of Cannabis-friendly establishments tap into a new and growing market. Some establishments already offer services. Cannabis themed city tours and 420 friendly camp sites and B&B's an example of existing businesses. There are also some clubs and dispensaries that are popular with tourists e.g. Cannibisters in Sea Point.

3.5 What investment plans are there already in the Western Cape?

Various investment plans have been publicly announced for facilities within the Western Cape, including the following:

- Expansion of Afrimat decorticator plant and hempcrete production facility
- Real food Co plans for hemp seed and oil production, with an investment proposal to sell the factory to the workforce.
- Hemp panel production plans, with scope to focus on the affordable housing market (championed by Wolf & Wolf Architects)
- Seed Oil South Africa – potential processor
- Distell and Invenfin have both invested in ReThink as part of their product innovation strategy, focusing on teas, shots, skincare⁷.

However, questions remain about the commercial viability of some of these investments. Most previous hemp research in South Africa has been focused on agronomy and genetic suitability, although there has been some research on natural fibres and composites e.g. for fibre board and automotive components. This research and product development would need acceleration through a targeted approach from government, institutions and the industry.

Existing facilities in the fodder and grain industry also have potential to be adapted and utilised for some aspects of the value chain, including animal feed and hemp grain. Similarly, other existing manufacturing facilities and equipment could potentially be adapted for hemp inputs e.g. sail-making, furniture and homeware, fibre glass and marine component manufacturing.

3.6 Who is involved, and how inclusive is it currently?

With the move to DALRRD and the subsequent media exposure, more commercial farmers have shown interest and successfully applied for hemp permits. Most have specific end goals in mind and are willing to do the research that is required. Some farmers have a short-term commercial interest, but the novelty and uncertainty around hemp calls for conservatism. Some aspiring farmers see a hemp permit as a stepping stone towards a medical Cannabis licence.

The reality of hemp vs cannabis as a potential income generating crop is putting traditional communities off from applying for permits. There is a lot of confusion and misinformation on the ground.

Consultants and aspiring seed suppliers are expanding into the main agricultural sector and are influencing thinking into mechanisation and the adaptation of existing equipment and methods to accommodate hemp.

There is interest from home growing enthusiasts around the planting of hemp, but care should be taken due to pollination issues and the potential instability and unsuitability of available genetics.

⁷⁷ <https://www.iol.co.za/lifestyle/food-drink/drink/brewing-company-distell-expands-into-cannabis-products-e6146d41-cc9b-459c-a05f-debbe1a6c046>

In terms of commercial-scale processing facilities, the capital investment required, and the high risks have been a constraint to broad-based participation.

3.7 How is the Western Cape activity linked to activity in other provinces?

Western Cape activity has various links to activity in other provinces, which provides a sense of the future potential integration and differentiation. Examples include:

- Hempcrete produced in the W. Cape is using hemp from other provinces. Hemp blocks will be sold nationally and internationally
- R&D: Comparative plantings of SA and other landraces with commercial hemp strains have not been done in the past. A permitted research project on the industrial traits of SA and Asian land race strains have been initiated in Simondium
- The well-established health product and cosmetics industry have opened their doors for the development of white labels products for inspired primary producers
- A hemp tea concept product has been developed to provide a market for dried leaves for growers across the country
- Hemporium supplies imported bulk fabrics and hemp-based products to cottage industries across the country
- The Western Cape is leading the country in hemp architecture
- The existing indigenous medicine trade is linking growers and healers across the country, with much interest in CBD and the other therapeutic uses of hemp

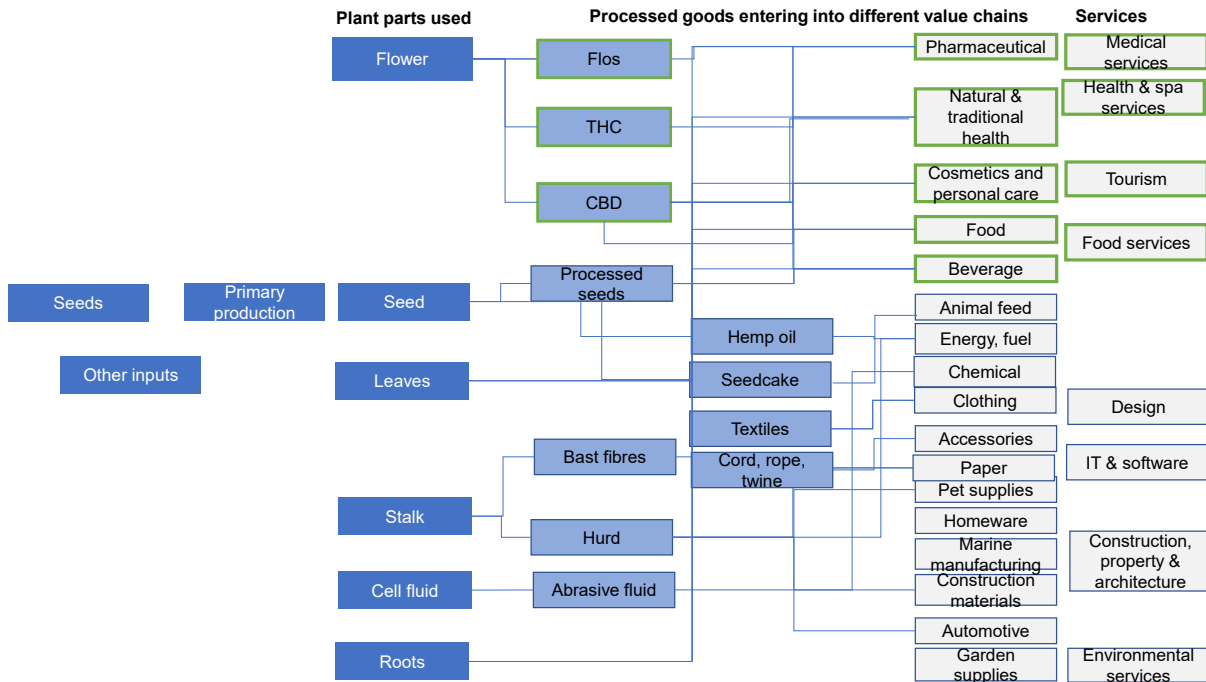
Potential implications, hypotheses and remaining questions:

The activity levels that are emerging spontaneously in the province provide an indication of interest and capability. They also demonstrate how the wider capabilities in the economy can be leveraged around cannabis and hemp (see also the value chain section). The trends also however demonstrate that – without active support - the formal and commercial part of the industry is not likely to be very inclusive or transformative.

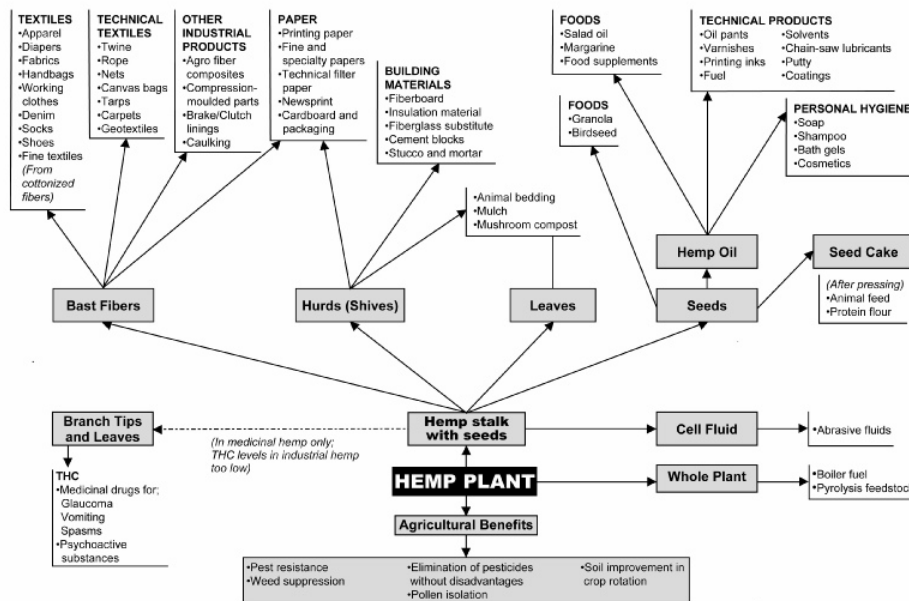
Further engagement and research are required to understand which of the planned investments are likely to come to fruition and be both viable and competitive in the long term, and how the development of the industry can realistically be made more inclusive and transformational.

4 What are the findings on key value chains for cannabis and hemp?

This section provides an overview of findings from available literature on key cannabis and hemp value chains. There is a high diversity of value chains that cannabis and hemp link into; The diagram below provides an overview of the various value chains based on literature reviewed to date, and how they relate to the different plant parts (boxes outlined in green are relevant to cannabis).



Much of this diversity is attributable to industrial hemp which is estimated to have 10 000 to 25 000 product applications, as summarised in the figure below⁸.



Source: Cornell Cooperative Extension of Tompkins County. From seed to market. <http://ccetompkins.org/nas> as quoted in TIPS (2020) Industrial Development Projects Industrial Hemp

⁸ European Hemp Industry Association the Future of Hemp; <https://esd.ny.gov/industrial-hemp>

4.1 Medical, pharmaceutical and health

Medical applications of cannabis are primarily derived from the flower. Hemp industrial medical applications are also derived from the seed. Traditionally the root and leaves have also been used for medical purposes, and some compounds can be extracted from the roots. Cannabis medical applications are constantly evolving, but scientifically recognised uses currently include: pain management; anti-cancer; nausea, loss of appetite, weight loss and wasting (including related to AIDS); tics, treatment-resistant glaucoma⁹. Hemp and CBD applications include stress and anxiety, sleep, anti-epilepsy; inflammation and lowering cravings or addiction management¹⁰.

The flower can be processed to various degrees:

- Cannabis flos: dried flowers in whole or granulated form, that have been grown for standardisation and lack of contaminants, and tested for consistency of active ingredients (THC, CBD, other terpenes)
 - This method is preferred by some consumers as the results can have quicker action, and there is some mixed evidence to date about the synergistic health effects or *entourage effect* of the combined effect on the human system and particular health issues rather than individual extracts¹¹
 - Optimal results are achieved through a specialist medical vaporisation device rather than smoking
- Extracts, distillations and oils
 - Processing of these extracts requires sophisticated equipment and technology for consistent and reliable extraction, distillation, vacuum distillation
 - It can be based on CO₂ or alcohol extraction
 - However, the actual primary production can be less standardised than for flos production, as standardisation can be achieved during the processing stage
- Dosage formats for extracts and oils such as tablets or capsules

Industrial processing for medical use - in particular for export - therefore requires extensive and onerous systems and processes for analysing, testing, tracking/tracing and reporting, as well as international certification such as Good Manufacturing Practice (see also the market and competition section). EU GMP is particularly onerous and expensive. Tracing goes back to each group of plants. Any contamination e.g. mould or water impurities may require destroying a whole batch of production and decontaminating the whole facility MG Health in Lesotho is reported to be the first cannabis producer in Africa to secure this certification in 2021¹².

In different countries the **supply chain** is organised differently. Sometimes it is linked to a central government agency, sometimes through doctors and sometimes

⁹ <https://www.cannabisbureau.nl/patienteninformatie/werkzaamheid>

¹⁰ <https://www.health.harvard.edu/blog/cannabidiol-cbd-what-we-know-and-what-we-dont-2018082414476>

¹¹ <https://www.sciencedaily.com/releases/2021/07/2107210714110455.htm>;

<https://faseb.onlinelibrary.wiley.com/doi/abs/10.1096/fasebj.2020.34.s1.04622>

¹² <https://www.iol.co.za/business-report/companies/mg-health-becomes-first-african-cannabis-firm-to-get-the-eu-good-manufacturing-practices-certification-0e54465a-d346-414e-846f-4150f84bc474>

through specialist dispensaries based on a script. It is expected that in time the supply chain will link into traditional pharmaceutical distribution networks.

There are examples of contract production e.g. in the United States hemp industry some research showed a mix of **contracted production** (around 10%, mostly annual contracts rather than long-term contracts), marketing contracts, spot purchases and vertical integration, with common practices by processors including a "toll scheme" where processors charge a processing fee or sharing a portion of the final product¹³

In terms of the **structure of production and investment**, in the past there were a lot of start-up producers, but increasingly mainstream companies are involved where medical cannabis has been legalised, and there has been a wave of investment by venture capital and mainstream producers in related sectors (such pharmaceutical and tobacco), which is resulting in various mergers and acquisitions.¹⁴

There are **ancillary industries emerging**, e.g. around medical devices for more effective drug delivery such as medical vaporisers, technology provision and packaging¹⁵.

4.2 Cosmetics and personal care

Hemp oil has been used in soaps for centuries, but now hemp and CBD oil related innovations, as well as products that use hemp hydrosols that are a by-product of distillation, are proliferating in this value chain. Hemp ingredients are increasingly being used in various cosmetics and personal care items, including¹⁶:

- Skin treatments, including creams, lotions, gels, oils, and serums, including anti-aging and post-menopause focused products, scar and stretch mark treatment
- Sunblocks and sun damage treatments
- Lip balms and lipsticks
- Soaps, handwashes and shower gels
- Shampoos and conditioners
- Hair growth and scalp treatment oils
- Massage oils and baby oils
- Scrubs (making used of the seedcake or seed by-products)

These applications are being developed and produced by both specialist companies and mainstream players that are tapping into trends around natural products, wellness and more eco-friendly production.

4.3 Food and beverages (human and animal)

Food value chains link to both CBD oil and hemp seed. Hemp seed can be processed into:

- Hulled hemp seed or hearts
- Hemp meal and hemp seed powder
- Hemp protein powder
- Hemp oils (cold pressed)

¹³ M.L. Bignon, University of Missouri-Columbia (2020) Contract Practices and Contract Design in the U.S Hemp Industry

¹⁴ Prohibition Partners research

¹⁵ For example, see <https://bedrocan.com/not-all-vaporizers-are-the-same/>

¹⁶ See <https://www.natrue.org/how-are-hemp-and-other-cannabis-sativa-l-extracts-used-in-cosmetics/>

- Seedcake (primary animal feed)
- Hemp milk alternative

Hemp and CBD extracts can also be added to other food and beverages, such as:

- Vegan and vegetarian protein blends and smoothie mixes
- Beverages include CBD-infused water, iced teas, juices, beers etc.
- Baked goods
- Animal and pet food preparations
- Honey

In the case of cannabis¹⁷, "edibles" range from gummies, sweets and chocolates to baked goods, with the cannabis making up a very small percentage of the total ingredients (the maximum level is typically regulated in each country).

Internationally, edibles are produced by both specialist cannabis manufacturers and generalist food producers that have a cannabis range.

Processing technologies required are the same as those required for each of the specific food and beverage industries, but with the added requirements for standardisation and traceability of the levels of THC, CBD, certificates of independent inspection of dosage levels etc.

4.4 Hemp bast and hurd fibre related value chains

Different types of useful fibres can be extracted from different parts of the hemp stalk, as shown in the figure below.



Source: Hemp New Zealand <https://hempnz.co.nz/learn/hemp-fibre-hurd/>

Hemp's long **bast** fibres are a strong alternative to other natural fibres given it requires fewer chemical inputs and water than crops such as cotton, and it has high durability. Many uses date back thousands of years. Contemporary uses of the fibres range from cord and rope, to home textiles, sails and canvas, clothing and accessories such as shoes and bags, and more recently pet accessories.



¹⁷ See Prohibition Partners (2020) *Disrupting Food*, public executive summary available via <https://prohibitionpartners.com/reports/>

Images: Hemporium

The **hurd or shiv** has applications across a range of value chains, including: construction materials (insulation, hempcrete, fire retardant, fibre board); carpeting; chemicals (bioplastics¹⁸, paints and sealants); homeware and furniture; animal bedding and compost. It is considered a more environmentally sustainable option than most other fibres, and in particular compared to conventional building methods, e.g. 108 kg of carbon dioxide (CO₂) per cubic metre of hempcrete can be captured as for the life span of the building¹⁹. It also has other advantages such as thermal and sound insulation, mould resistance, and fire retardance.



Khayelitsha Yiza EKhaya Hemp House



Cape Town hemp building estimated to be tallest hemp building in the world.

The processing first requires retting (microbial action that helps separate out the fibres, which can be done in field or in holding tanks with water; in most places in the world retting in rivers or ponds has been outlawed due to pollution of water bodies).²⁰ The next stage includes use of decorticator machinery or scutching processes, which can range from large and fully automated to micro-processing and manual input. Other processing steps include grading/categorisation and hackling/combing and carding, as well as potentially dyeing. In some cases equipment can also be used for processing other natural fibres derived from stalks such as kenaf, flax or sisal.



Source: WikiMedia Commons



Hurdmaster Hemp Micro-Decorticator
(Source: hurdmaster.com)

¹⁸ <https://horimasabp.com/english/industrial-hemp/>

¹⁹ <https://www.engineeringnews.co.za/article/hempcrete-advantageous-for-construction-2020-07-17>

²⁰ <https://highgradehempseed.com/blog/retting-and-hemp-fiber-extraction-process/>

Paper can use a mix of bast and hurd fibres; research into biopulping methods is taking place, to avoid the environmental impacts of conventional chemical processes²¹.

Hemp fibres can also be used in combination with other natural fibres and in composites e.g. automotive panels.



Source: Redspiderfish/Flickr

4.5 Energy, biofuels and lubricants

Hemp can be used as a biofuel. Biodiesel can be produced from the hemp seed whereas ethanol/methanol comes from the fermented stalk. Hemp oil can also be used as a food grade industrial lubricant.

However, the economics of this value chain are not always justified given the financial return e.g. prices for hemp seed and hemp oil are far higher than for biodiesel.

4.6 Environmental services

Hemp is being used around the world to provide various environmental services, including:

- Carbon capture – hemp's rapid growth level means that it is estimated to capture more carbon than trees and most other crops, and with less water use or harmful inputs (with estimates ranging from 8 to 22 tonnes of carbon dioxide per hectare each year, compared to 2 to 6 tonnes for forest) ²²
- Soil remediation and improvement, including phytoremediation (removal of toxins and contaminants from the soil)
- Air quality improvement
- Riverbank and water course stabilisation
- Outcompeting invasive alien plants to enable biodiversity restoration in subsequent years

Cannabis in contrast has a high carbon footprint because of the inputs (greenhouse production, water inputs etc).

²¹²¹ https://www.researchgate.net/figure/Hemp-paper-lifecycle-a-The-hemp-plant-can-be-cultivated-on-either-side-of-the-equator_fig1_349286742

²² Hemp-30 Phase I Final Report, 2020, University of York, available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1089680/Phase_1_report_-_University_of_York_-_HEMP-30_catalysing_a_step_change_in_the_production.pdf ; <https://hempindustrydaily.com/hemp-twice-as-effective-at-capturing-carbon-than-trees-uk-researcher-says/>

4.7 Tourism (agri-tourism, medical tourism, recreational and lifestyle tourism)

Some regions in the world have had success in establishing themselves as destinations for cannabis tourism in various forms. (Note: In the South African context this could be subject to the expected regulatory amendments around private and recreational use, although medical tourism could be possible under the current regulatory regime.)

Amsterdam is probably the most world-famous location which has attracted tourists to the “coffee house” culture for decades. However, recently the mayor has been pushing for changes to clean up Amsterdam’s image and improve the quality of life for local residents by reducing “drug tourism” which is seen by some residents and businesses as having undesirable impacts. The designated areas of Amsterdam had attracted more than a million visitors a month, often for weekend party trips by tourists from elsewhere in Europe thanks to cheap flights. More than half of these visitors indicated that a visit to one of the 166 coffee shops was part of their reason for visiting.²³

In the **US, cities/states** that have opened up cannabis use have become cannabis tourism destinations. For example Portland, Oregon (with dispensaries but use in public is prohibited) has developed a diverse cannabis tourism offering, including²⁴:

- specialist tours, including farm tours, visits to dispensaries and manufacturers of edibles, skincare etc.
- curated experiences, private clubs
- cannabis-friendly lodging ranging from backpackers to “bud-and-breakfasts” to luxury boutique hotels
- specialist spa experiences,
- cannabis themed party buses and tour buses
- themed festivals, film festivals, shows and events

Jamaica²⁵ which has a long tradition of religious and traditional use, now also has cannabis-related tourism. The legal framework technically only allows for medicinal rather than recreational use, but no prescription from a local doctor is required, and visitors to the country can self-declare their medical use. The main traveller group is seniors seeking pain relief alongside a relaxing holiday experience. Tourism offerings include retreat centres, cannabis farm tours, cultural experiences and specialist accommodation.

Thailand is in the early stages of cannabis tourism after legislative shifts pushed by communities in order to regularise traditional medicinal uses. Even though the regulatory changes were around medical cannabis only and not recreational use, the tourism industry seems to be using the opening to attract tourists to overcome a post-Covid slump²⁶. This is in stark contrast to the country’s previous hard-line stance, but there have been some tensions around the legislation.

²³ <https://www.iol.co.za/travel/world/europe/in-effort-to-clean-up-its-image-amsterdam-looks-to-restrict-tourists-from-coffee-shops-c9c46f94-02c7-5422-88eb-a2f4098aa426>

²⁴ <https://www.lonelyplanet.com/articles/cannabis-tourism-portland-oregon>

²⁵ <https://www.travelweekly.com/Caribbean-Travel/In-Jamaica-a-ganja-friendly-getaway>

²⁶ <https://www.theguardian.com/travel/2022/aug/11/thailand-aims-for-high-season-with-u-turn-on-cannabis-law>

4.8 Enabling services

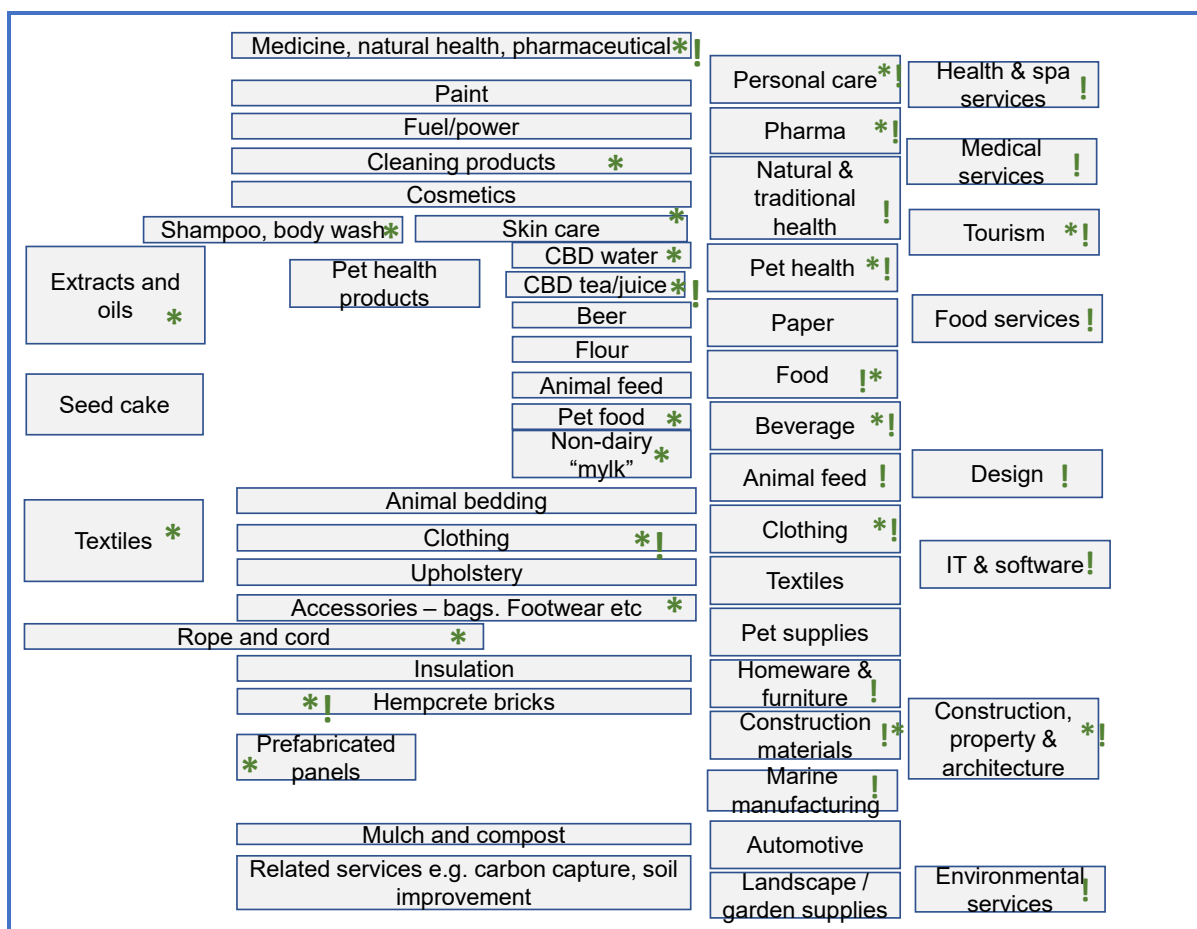
The cannabis and hemp value chains rely on a range of specialised enabling services (most of which are already mentioned in the National Cannabis Master Plan), including:

- Genetics development and testing
- Seeds and growing material propagation and supply
- Equipment development, supply and maintenance
- Analysis and testing
- Certification
- Product development
- Manufacturing development
- Financing
- Market research
- Marketing and consumer awareness raising, as well as overcoming stigma and misinformation
- Education and training
- Logistics and order fulfilment with traceability
- Support for regulatory compliance

Internationally these services are provided by a diversity of role players, including public, private, academic and non-profit entities.

Potential implications, hypotheses and remaining questions:

The diagram below provides an initial assessment of where there is existing activity or value chain capability in the Western Cape.



Key

* = existing hemp-related activity in W. Cape

! = Wider established value chain in W. Cape

Based on the above, below is an initial list where there is an overlap between cannabis and hemp value chains and existing value chain capabilities that could merit further exploration to understand opportunities and areas of competitiveness.

- Seed production and horticultural services and retail
 - The Klein Karoo is well established in agricultural seed production (in particular lucerne and onions seed) and can be utilised for rapid hemp seed multiplication.
 - Large seed suppliers and importers headquartered in the Cape include Bahrenbrug and Agricol.
- Fresh and part-produced agricultural exports
 - The 2022 Provincial Economic Review and Outlook highlights the outperformance of agricultural exports vs. all other sector exports over the past decade despite the drought years
- Food and animal feed
- Alcoholic beverages
 - Particular useful capability in regulated sector compliance and exports
- Education and training
- Construction materials, construction services, property and architecture

- Design, clothing and accessories
- Environmental services and green economy more widely
- Software development and data
- Medical devices e.g. drug delivery for vaporisation and dosing
- Indigenous and natural products supply chains (medicinal, health, tea, etc)
- established natural cosmetic and health product sector with supply chains from rural areas, essential oil extraction, distillation, related engineering, white label manufacturing and marketing; regular exports of essential oil and herbal extracts to Europe, with many producers running at capacity.
- Natural health and medical services and medical research e.g. clinical trials
- Tourism: Agri-tourism, medical, health and lifestyle tourism
- Marine manufacturing and other fibre glass related and carbon industries (sails, luxury leisure craft components, work boats, canopies and delivery van shells, trailers, solar geysers)
- Furniture and homeware
- Possibly also specialist packaging

5 What is the available information on markets and competitors?

The cannabis and hemp industries present particular market and competitor data challenges given the historically “grey market” and informal nature of some of the industry, specialist regulatory data that is not always publicly available, and the rapidly changing regulatory landscape causing sudden changes to market and competition patterns. The specialist market research reports available often rely on modelled data, and more detailed information or specialist research is prohibitively expensive.

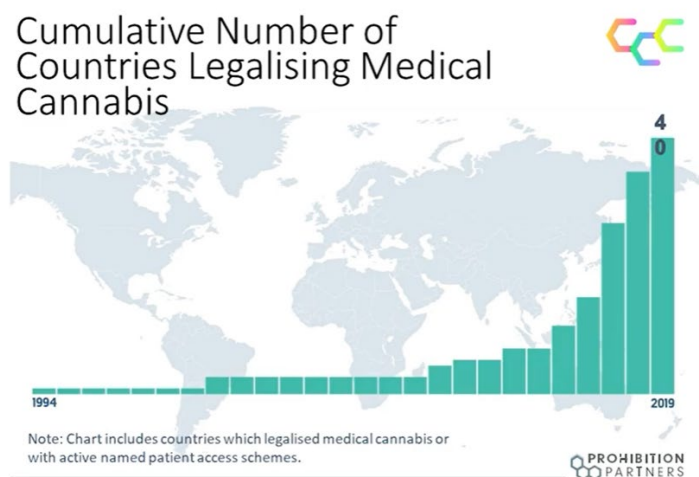
The section below provides the information that the project team has been able to gather during the literature review, which will be supplemented by expert and role player input during later stages of the project.

5.1 What are the main markets for medical cannabis and hemp?

5.1.1 Which geographical markets are major importers

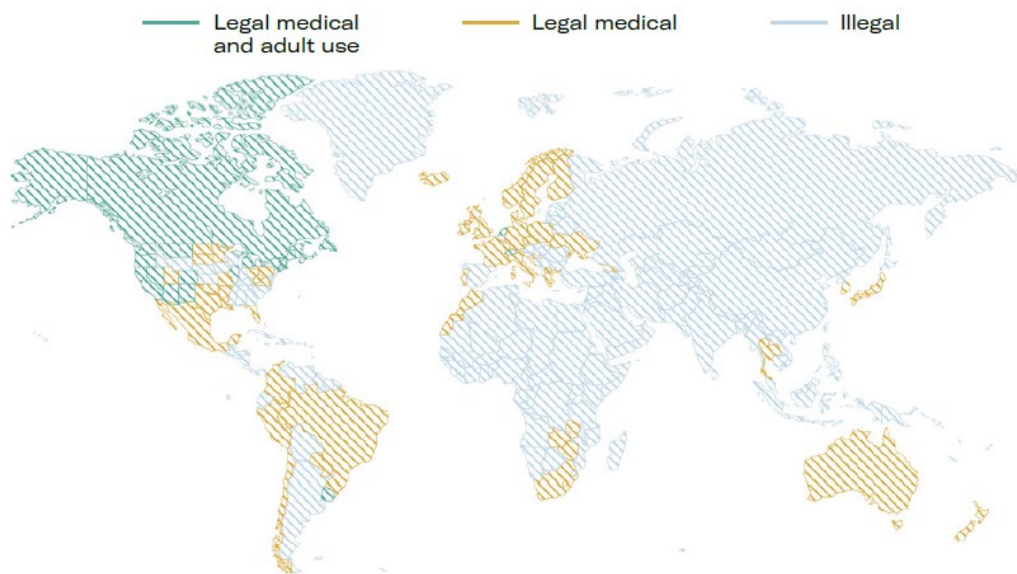
The relationship between consumption markets and import markets is made more complex for cannabis and hemp by the individual regulation and restrictions in each country. For example, the United States is considered the largest consumer market based on available data, but imports are still banned at federal level and cannabis cannot be moved across state lines, therefore it is not a cannabis import market. On the other hand, hemp can be imported.

Market possibilities for **medical cannabis** are rapidly changing as countries legalise medical cannabis, as shown in the trend in the Prohibition Partners presentation below.



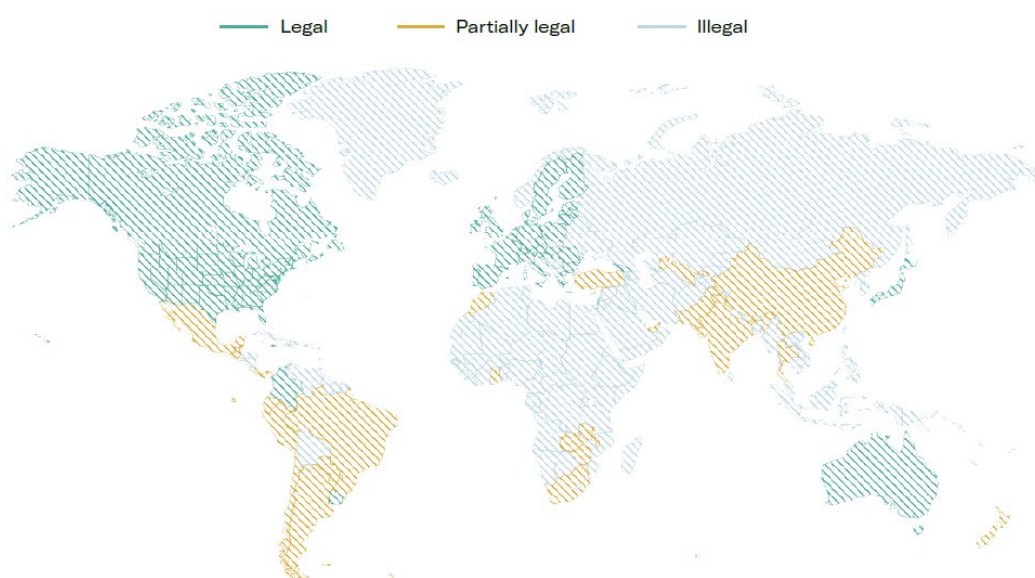
The Global Cannabis report extract below shows the state of legalisation of cannabis and CBD as at 2021.

Legality of medical and adult-use cannabis globally



Source: Prohibition Partners.
 *Legal status as of late 2021. Decriminalised use of cannabis is not considered legal here.

Global legality of CBD sales



Source: Prohibition Partners
 *Legal statuses as of late 2021

Source: Prohibition Partners (2021) Global Cannabis Report, Second Edition

However, **regulatory changes not always being followed by easy access or import growth into these markets.** Whilst numerous companies are investing on the basis of these regulatory changes, the actual market growth has been slower than expected for many markets. The **EU** overall is a key market for medical cannabis, but with quite high barriers to entry (EU GMP is required and new pharmaceutical products will need to be registered for marketing within the EU which can be very expensive). In addition, each EU country can have specific market entry channels and requirements. For example, **Germany**, which is currently the largest import

market for medical cannabis, requires product to be pesticide free and generally needs to be irradiated to reduce microbial levels. In some cases, exporters have found a work-around by completing final stage processing, irradiation and packaging within the EU, but it is not clear if this mechanism could be removed in time.

Transparency of **trade data** is also hampered by the lack of many global HS trade codes (HS4 or HS 6 level) that specify hemp or cannabis. The only codes are:

- HS5302: True hemp ""Cannabis sativa L."" , raw or processed, but not spun
 - HS530210 "True hemp ""Cannabis sativa L."" , raw or retted"
 - HS530290 "True hemp ""Cannabis sativa L."" , processed but not spun tow and waste of hemp
- 530820: Hemp yarn

Numerous countries do specify cannabis or hemp at their unique HS10 or tariff code level, but this is not comparable across countries. These typically fall within the following wider categories:

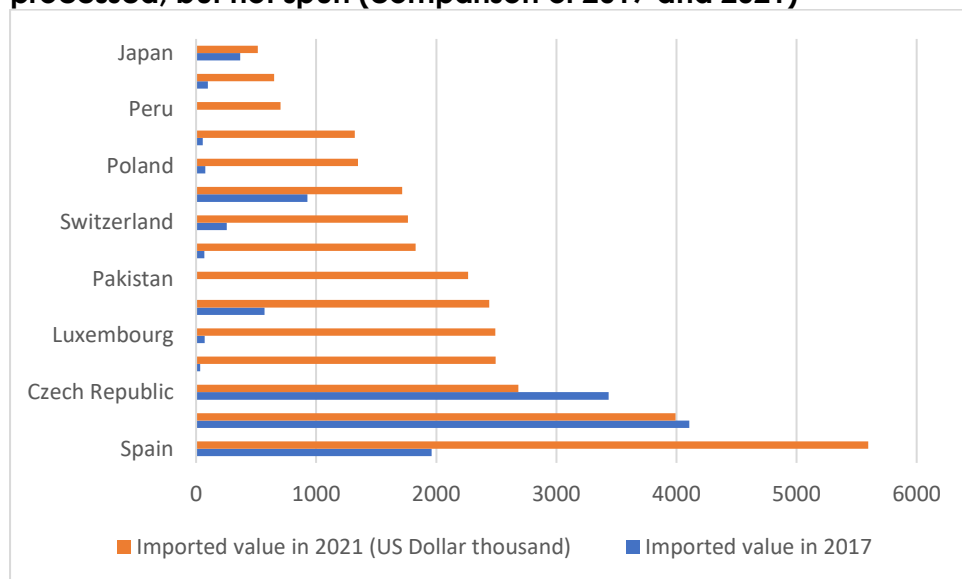
- HS120799: Oil seeds
- HS121190: Plants, parts of plants, incl. seeds and fruits, used primarily in perfumery, in pharmacy or for insecticidal, fungicidal or similar purposes, fresh, chilled, frozen or dried, whether or not cut, crushed or powdered
- HS130190: Lac; natural gums, resins, gum-resins, balsams and other natural oleoresins (excluding gum Arabic)

However, there is not always a relationship between countries that have specified a cannabis HS10 code and those that are major importers e.g. Germany is one of the largest importers of medicinal cannabis, but does not appear to have a cannabis-specific HS code.

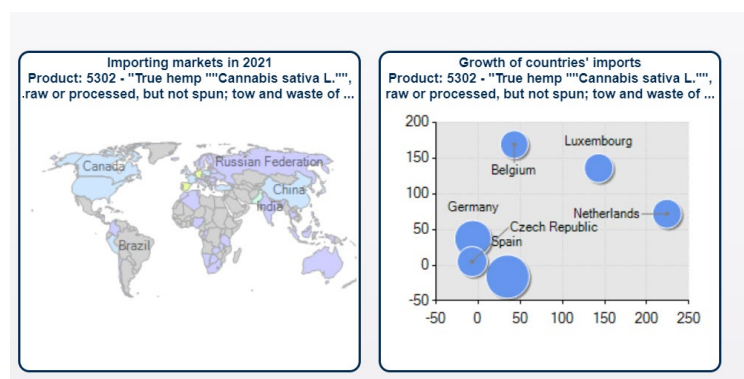
Import and market data is therefore often limited to proprietary reports prepared by specialist market research companies or industry publications that are making estimates based on other research such as number of registered patients for medical cannabis.

An example of key importers of the Hemp HS 5302 product grouping is provided in the table and figures below.

Figure 1: Imported value of HS5302 True hemp "Cannabis sativa L.", raw or processed, but not spun (comparison of 2017 and 2021)



Source: ITC TradeMap data



Source: ITC TradeMap

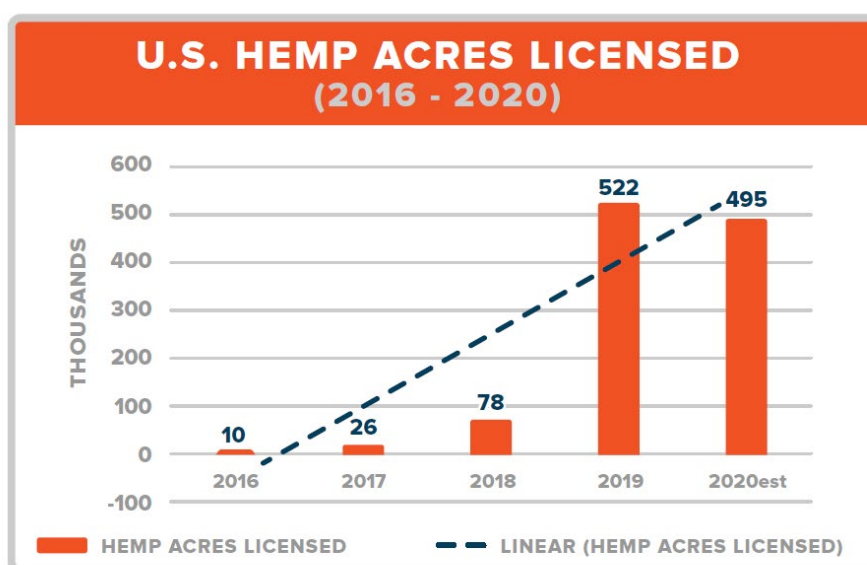
End-use markets for industrial hemp, as indicates in the value chain section, span thousands of product categories which also include many other inputs, each with different import dynamics; it is therefore not practical to examine each of these markets at this stage of the project. It is estimated that the **United States is the largest global market for industrial hemp**. A large proportion of this demand is met by internal production, with the USDA estimating industrial hemp production to the value of \$824 million in 2021 with an estimate 500 000 acres licensed and around 50 000 acres under production in 2021²⁷ There have been imports in the past, as shown by the table below, but the rise in local production is likely to diminish this market.

²⁷ USDA Hemp Report, 2021

Table 1: US Imports of industrial hemp (US\$ '000)

	2013	2014	2015	2016	2017
Seeds	26 942	29 326	54 191	51 018	42 897
Oils	2 264	3 446	4 836	6 142	7 603
Oil Cake	6279	8 159	16 281	8 620	11 494
Fibres	78	114	292	690	780
Yarn	482	909	1 497	1 867	2 739
Woven fabrics	1 057	900	1 020	744	1 819
Total	37 102	42 854	78 117	69 081	67 322

Source: Hemp Industries Association, <https://www.thehia.org>



Source: 2016 – 2018 Vote Hemp, 2019-2020 Whitney Economics

There is some **overlap between geographical markets for hemp and cannabis and the established export markets for the Western Cape**, as per the 2022 PERO report, see extract below.

Table 2.5 Top 10 export and import markets for the Western Cape, 2012 - 2021

Rank	Imports	Value 2021 (Rbn)	% 2021 Share	% 2021 Share	% point difference	Rank	Exports	Value 2021 (Rbn)	% 2021 Share	% 2021 Share	% point
1	China	51.3	11.0%	21.8%	10.8%	1	United States	17	5.2%	10.2%	5.0%
2	Oman	19.5	0.2%	8.3%	8.1%	2	Netherlands	14.4	6.8%	8.6%	1.9%
3	India	17.9	5.1%	7.6%	2.5%	3	United Kingdom	12.5	6.5%	7.5%	1.0%
4	Saudi Arabia	14.6	21.0%	6.2%	(14.8%)	4	Namibia	11.1	8.4%	6.7%	(1.7%)
5	UAE	13.1	2.6%	5.6%	3.0%	5	China	10.1	1.7%	6.1%	4.3%
6	Italy	11	2.2%	4.7%	2.5%	6	Botswana	8.9	8.0%	5.4%	(2.6%)
7	Germany	7.1	2.7%	3.0%	0.3%	7	Germany	5.2	3.8%	3.1%	(0.7%)
8	Netherlands	6.9	2.8%	2.9%	0.1%	8	India	5	1.1%	3.0%	1.9%
9	United States	6.6	2.3%	2.8%	0.5%	9	UAE	4.2	2.1%	2.5%	0.5%
10	United Kingdom	5.2	2.8%	2.2%	(0.6%)	10	Lesotho	3.7	2.2%	2.2%	0.0%

Source: Quantec, Own calculations

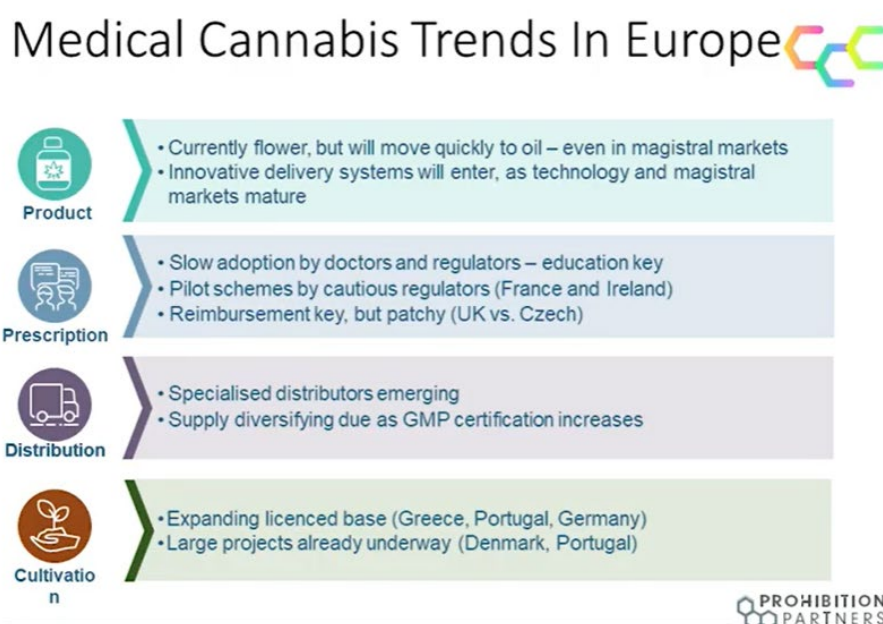
5.1.2 What information is publicly available on specific market categories?

Prohibition Partners, one of the leading global specialist cannabis market research companies, has estimated that sales of CBD, medical and adult-use cannabis together were valued at US\$37 billion, which could grow to US\$102 billion by 2026.²⁸

Medical cannabis is a segment that has a lot of expectations of growth. The global cannabidiol market size has been estimated at USD 5.18 billion in 2021 and is expected to expand at a compound annual growth rate (CAGR) of 16.8% from 2022 to 2030.

However, **current official import levels for medical cannabis remain quite small.** Some high consumption markets such as the US and Canada are not import markets. Germany is considered one of the largest import markets for cannabis in the world at present, but estimates are that imports of medical cannabis in 2021 were only 10 to 15 tonnes at an average wholesale price of €2/g, i.e. total imports of €20m to €30m²⁹. Production investments within Europe (Spain, Portugal, Norway) far outstrip this current import demand e.g. one facility in the South of Spain could supply the whole German market currently.

Some key trends in the European medical cannabis market are summarised in the presentation extract below:



²⁸ Prohibition Partners (2021) Global Cannabis Report, 2nd edition

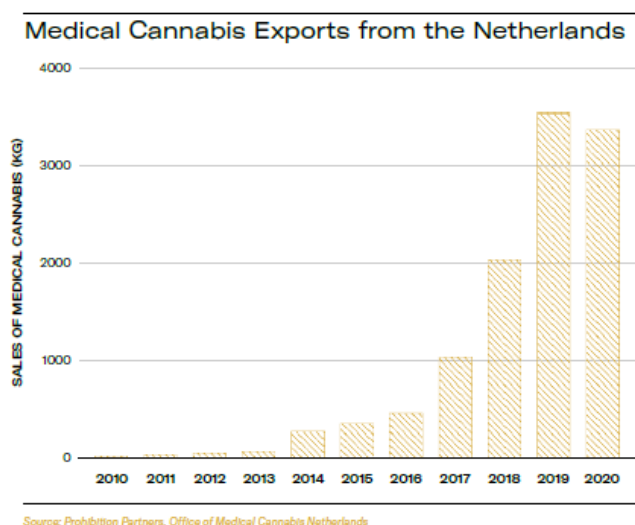
²⁹ International cannabis expert, personal communication

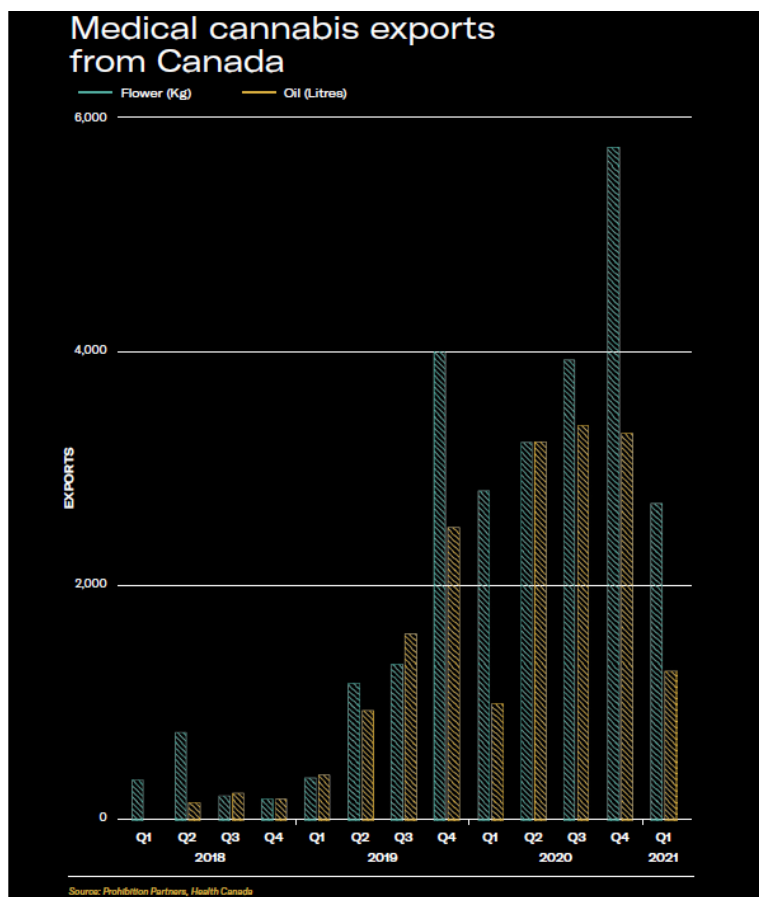
CBD remains a “grey market” in many geographies, with unclear regulation but high level of innovation and new product entries into the market, driven by health and wellness trends, and therefore market data is not that reliable.

5.2 Which are the major producer countries?

For medical cannabis, **Netherlands and Canada** are the most established formal producers. Many other countries have large-scale informal or illicit production, including across Asia, Africa and Latin America. In the case of hemp, traditional producers include France and China.

The oversupply in established producer countries such as the Netherland and Canada is playing through into rapidly growing exports, including to Europe, as shown in the graph below.





Source: Prohibition Partners (2021) Global Cannabis Report, Second Edition

Canada is developing strong certified production capacity and export capacity for medical cannabis – e.g. over 180 license holders and 6 GMP certified medical cannabis facilities by 2019³⁰.

The pattern of production is shifting rapidly with legalisation or deregulation of cannabis and hemp in many countries.

Many production projects under way for both cannabis and hemp in **Europe** that are coming on stream, which is expected to play through into Europe being more than self-sufficient. This is expected to create a glut of production, which could play through to lower prices and some producers struggling to sell. It seems that production peaked in 2019; after that many farmers stopped producing, shift from seeing as a mainstream crop to more of a niche crop³¹. Similarly, the UK is planning to expand hemp production from 800 to 80,000 hectares³².

Latin America is seen as a potential high growth production area for medical cannabis and hemp. **Colombia** is expected to be very low-cost producer of medical cannabis thanks to ideal climate and low labour costs³³. Many new licenses are being issued and significant investments have already been made – estimated

³⁰ Prohibition Partners analysis

³¹ <https://www.pewtrusts.org/en/research-and-analysis/blogs/stateline/2021/07/09/the-hemp-boom-is-over-what-now>; Prohibition Partners Presentation

³² <https://www.york.ac.uk/news-and-events/news/2021/research/boosting-uk-hemp-production/>

³³ Prohibition Partners analysis

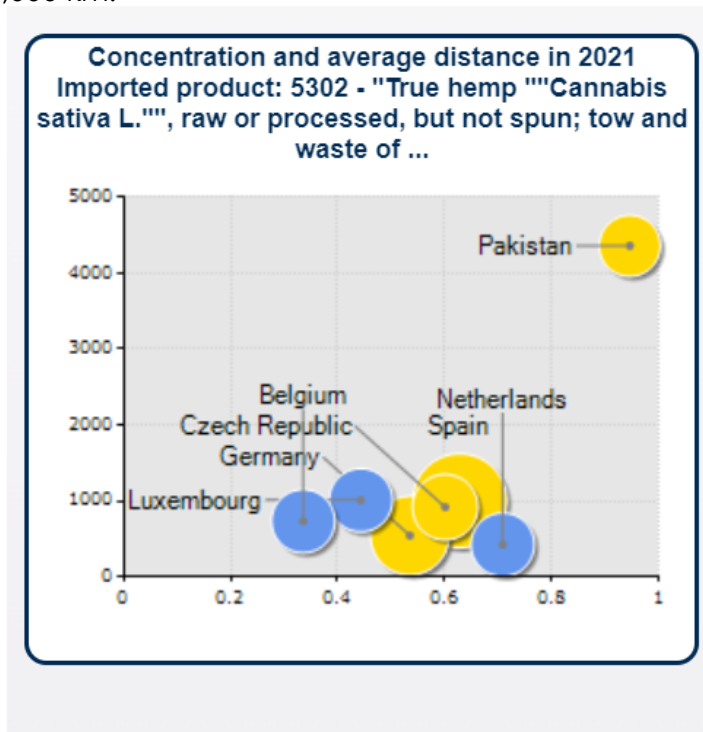
at over US\$400 million by 2020³⁴. **Chile** has over 400 years of history in growing hemp. It used to be across the whole country but is now more concentrated in the optimal growing areas. The production declined over time though, as the market for the hemp sacks and bags was substituted by lower quality but cheaper plastic alternatives, as well as the prohibition of wet retting for environmental reasons.

Closer to home, **Lesotho is gearing up to becoming a global player** with the MG Health Facility, which is EU GMP certified, and in the pilot phase is producing 250kg, exporting to Germany initially, with potential to scale up to 100 tonnes a year. MG Health argues conditions are ideal with sunlight hours, lower humidity and clean water³⁵.

5.3 What are the supply and competition patterns?

Historical trade restrictions and the highly regulated nature of cannabis and hemp have shaped the supply patterns. For example, it is still not possible to import cannabis into the US because of federal regulations, or to move cannabis across state lines, so supply is localised. 2018 changes to the Farm Bill opened up production for hemp. In the major markets of the EU, restrictions have also shaped supply, e.g. the Netherlands does not allow imports and all supply is through one state structure; in the case of Germany medical cannabis importers have to be specially licensed.

Traditionally, hemp trade has been more regional, as shown by the graph of distance of trading partners for HS5302 from ITC below, where most trade is within 1,000 km.



³⁴ <https://www.rivcapital.com/the-deep-end/blog-details/the-deep-end/2020/04/21/cannabis-entrepreneurs-bet-big-on-pot-as-a-global-commodity>

³⁵ <https://www.iol.co.za/business-report/companies/mg-health-becomes-first-african-cannabis-firm-to-get-the-eu-good-manufacturing-practices-certification-0e54465a-d346-414e-846f-4150f84bc474>

Increasingly the need for value chain collaborations between countries with strong hemp production and those with large-scale and competitive textile production infrastructure is being recognised (e.g. between Europe and India) to scale up industrial production.

As mentioned earlier, oversupply and gluts are expected to **drop prices**, which will also shape supply patterns as **higher cost producers will not be able to break even**. Industry experts predict a consolidation and shake-up in the industry, with “boom and bust” cycles, closures and bankruptcies. As regulation opens up, production might start to move from higher cost locations such as Canada and Europe to lower cost locations where climatic conditions are more suitable, the cost structure is lower, and investments are taking place (such as **Colombia** as described above). **Africa and SE Asia are also expected to become lower cost production locations**. In the case of Africa, expectations are that the significant scale of existing production which is estimated to be over 38,000 tonnes of cannabis per year (mostly illegal under current regulatory regimes) could be leveraged to become a future global player³⁶.

Potential implications, hypotheses and remaining questions:

There is high uncertainty around market developments which presents a risk for Western Cape producers.

There are also significant risks for Western Cape producers associated with the significant investments taking place around the world in both primary production and processing for both hemp and cannabis, which could result in oversupply, gluts, commodification, and reduced pricing.

Opportunities may however exist in the reorganisation of supply chains, shifts to lower cost production and processing locations and growing openness to imports.

³⁶ Prohibition Partners (2019), African Cannabis Report, public executive summary available at <https://prohibitionpartners.com/reports/>

6 What are key issues in the legislative and regulatory context?

Key legislation and regulation applicable in South Africa include the following:

- The Medicines and Related Substances Control Act and schedules
- Plant Improvement Act - hemp permitting regulations, schedules etc
- Plant Breeders Rights Act
- Drugs and Drug Trafficking Act
- International Drug Control Conventions and Treaties, including the Single Convention on Narcotic Drugs of 1961, Convention on Psychotropic Substances of 1971 and United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances of 1988
- Sectoral regulation and standards e.g. construction materials
- Cannabis for Private Purposes Bill I

Some of the key issues that have been identified in terms of this regulation are set out below:

Cannabis licensing

The licensing process can add time, cost and uncertainty to the investment and setup process. Growing of Cannabis is seen as pharmaceutical manufacturing by SAHPRA, and this causes additional costs in production. SAHPRA requires a fully built and compliant facility before a licence will be issued, with no preliminary process of approval for entrants seeking investment. There are also inconsistencies in the interpretation of guidelines by SAHPRA officials, as well as inconsistent lead times. A project often takes about 2 years from start to licencing, with minimum investment of R10 million required.

Some facilities did get licences for small prototype plants that cost less, but those are not on commercial level. SAHPRA compliance does not ensure market acceptance and further requirements often need to be met to qualify for European markets - Good Agricultural Practice and EU Good Manufacturing Practice - leading to additional admin and cost. Agricultural production is simplified under GACP, and the cost of compliance is manageable and expected by most commercial farmers. Production cost of medicinal cannabis is raised by regulation, but overall cost is still likely to be competitive with international norms. It is likely that for example EU GMP compliance costs would far exceed local licensing costs. Development of local certified analytical services is needed to bring the cost of testing down.

This level of regulation is expected in the industry globally, and the cost is not likely to be significantly higher in the Western Cape than in the rest of the world. Credibility in South Africa's certification systems is needed internationally. Stability testing services need to be developed urgently.

International obligations

Many countries have to date focused on regulating medical cannabis, following requirements around cultivation under state control in accordance with the UN Convention, as is the case with Germany³⁷.

However, some countries are now challenging what they consider the outdated treatment of cannabis within UN treaties, and are starting to deregulate across the full spectrum of both medicinal and regulatory use. Some may be banking on the recent changes to the UN treatment of medical cannabis being extended in time to responsible adult use more widely. Jurisdictions taking this approach include Canada, Spain and Uruguay. Canada has argued that their position falls within the overall principle of protecting the health and wellbeing of their citizens.³⁸ Germany is also currently exploring options for legalisation of recreational use, and the treaties do not provide for sanctions for non-compliance.³⁹

Hemp permitting

The system has been streamlined by DALRRD, but police clearance is still required which can be a long process. Once all documents are in place permits are issued within 1 month. Basic fencing requirements with limited guidelines on compliance testing is required by the farmer.

Small-scale and emerging farmers are advocating for reducing the cost and administrative burden. Similarly, recommendations have been made to the NCOP and Nedlac to deregulate hemp cultivation, and for grandfather clauses to enable existing traditional growers to be integrated into industry without onerous obligations.

CBD

Like many other countries around the world, the regulation of CBD (currently SAHPRA registering as a Schedule 4 substance) is not well-matched with the rapid innovation and product development taking place in the space, with numerous unregistered products emerging.

Sectoral standards and codes

There is scope for further integration of hemp industrial products into sectoral regulation. For example, National Building Regulations and SANS codes for hemp construction materials and building methods will need to keep pace with the rapid innovations in this sector. Afrimat for example has chosen to secure Agrément certification (international certification) for their hempcrete building systems.

Private use and recreational use

The constitutional court judgement has entrenched the right to grow and use Cannabis in privacy. Haze club case appeal will guide the process. The Cannabis for

³⁷ <https://www.theworldlawgroup.com/news/2020-global-cannabis-guide-germany>

³⁸ <https://www.canadianlawyermag.com/news/general/international-law-experts-say-legal-cannabis-defies-canadas-un-treaty-obligations/275627>

³⁹ <https://www.lexology.com/library/detail.aspx?q=81f5f668-1bfd-4390-b95e-be763fd9c057>

Private Purposes Bill addresses some of these issues, but stopped short of commercialisation. The current version of the bill faces constitutional scrutiny as well as pending review by the House of Traditional Leaders.

In the meantime, the Constitutional Court judgement has been interpreted and applied to a variety of business models, including private clubs, grow clubs, grow shops, head shops, dispensaries, Cannabis lounges and restaurants serving Cannabis infused cuisine to their members, even though technically they may be operating illegally. This has forced rapid expansion in the industry, with growers and consumers suddenly able to connect through these various platforms. It seems like this market has stabilised, with most new entrants finding it hard to compete.

Most of these initiatives are still aimed at an affluent audience and few safe and legal solutions exist for traditional communities to access Cannabis. The existing street corner and shebeen trade continues with no apparent change. Most Cannabis into this market is sourced from neighbouring countries, with the exception of a few months when the local harvests from backyard and small farmers are available. This market was previously also supplied out of the Eastern Cape, but Covid lockdowns changed the dynamic of the market and very little low-grade Cannabis from legacy growers find its way onto the streets of the Western Cape at the moment. The exception is Cannabis of a higher grade grown in the coastal areas of the former Transkei.

Potential implications, hypotheses and remaining questions:

Regulatory compliance for cannabis production and processing are not insurmountable obstacles for established commercial producers and processors, but do add cost and time, and present a barrier to entry for smaller and emerging players.

Continued shifts in international regulation of cannabis are to be expected, which could impact on future trade prospects and the space to develop industries related to recreational cannabis.

Further refinement of regulation could open up opportunities related to CBD and industrial hemp applications such as construction materials.

7 What do we know about challenges to competing and transformation?

The challenges identified in National Cannabis Master Plan remain relevant to development of the industry in the Western Cape, namely:

- Legislative restrictions
- No formal seed supply systems
- High entry barriers
- Negative public perceptions
- Lack of manufacturing capacity.
- Limited investments in research and technology development programmes for Cannabis
- Highly fragmented sector
- Proliferation of illegal products
- Market challenges
- Threat of takeover or dominance by big corporations and pharmacy groups with big money

Further detail on the regulatory issues is set out in Section 6.

Some other cost-competitiveness related issues have been identified through the research for cannabis production.

- **Set-up costs** include: land acquisition if not already owned/rented, greenhouses, irrigation, temperature and humidity control, lighting, monitoring and data analysis systems, security fencing and cameras, quality systems
- **Ongoing input costs and factors** include: power, water, nutrients, analysis and testing, security monitoring, labour and management, certification

Some of these costs are likely to be higher than competitors in other countries, notably **security and backup power**. The Neopharm investment in the Cape Winelands provides an example where costs were much higher than initially expected, in particular because of security costs (fencing, access control points, cameras). It ended up being a R70m investment for a 400sqm production and processing facility. Backup power also constitutes an additional cost. They were expecting 24 months where they would need to carry costs whilst proving capability, securing contracts and then breaking even. Hydrobiz estimated that new cannabis producers would require a minimum investment of R10m for setup and initial operations⁴⁰

Greenhouse costs could be competitive in the Western Cape given the established industry.

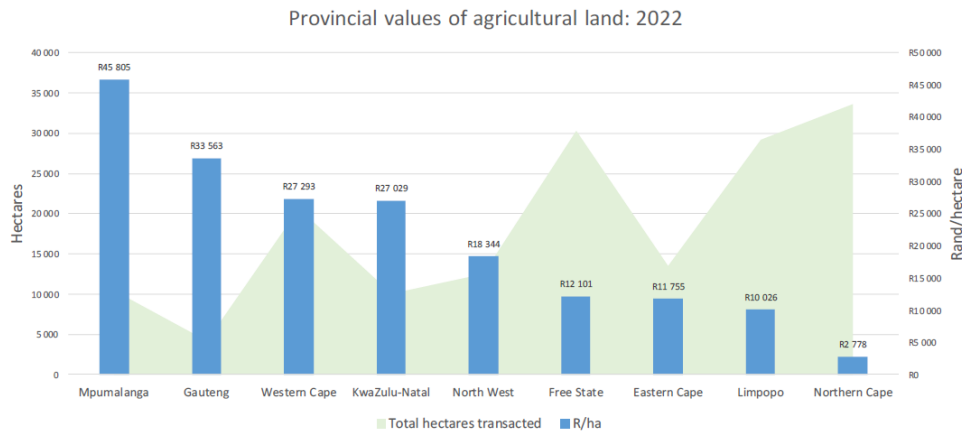
Water costs are less of an issue, but **water availability** is of concern. Labour costs could be lower in the Western Cape than northern global competitors, but not compared to Southern competitors such as Colombia. Capital financing costs in South Africa might also be higher than in Northern countries.

In terms of hemp, agricultural and processing facility **land costs** in the Western Cape on average are lower per hectare than Gauteng, comparable with KZN, but higher

⁴⁰ <https://www.farmersweekly.co.za/agri-business/agribusinesses/growing-medical-cannabis-a-capital-intensive-venture-with-big-returns/>

than some other provinces targeting cannabis and hemp production and processing such as the Eastern Cape and Northwest.

Provinces	Transactions	Gross value of transactions	Total hectares transacted	Average Farm Unit (ha)	R/ha
Mpumalanga	46	R476 429 624	10 401	226.1	R45 805
Gauteng	43	R141 258 126	4 209	97.9	R33 563
Western Cape	46	R563 391 340	20 643	448.8	R27 293
KwaZulu-Natal	35	R270 764 534	10 018	286.2	R27 029
North West	63	R229 193 208	12 495	198.3	R18 344
Free State	64	R365 993 100	30 245	472.6	R12 101
Eastern Cape	28	R158 861 016	13 514	482.6	R11 755
Limpopo	43	R292 766 375	29 202	679.1	R10 026
Northern Cape	13	R93 493 962	33 657	2 589.0	R2 778



Source: Western Cape Dept of Agriculture [Provincial agricultural land prices, January 2022](#)

8 What is publicly known about provincial governments' support plans?

Various provinces have publicly announced support plans and strategies in relation to the cannabis and hemp industries. Available information is summarised in the table below. Additional information may emerge through the stakeholder and expert engagements during the course of the project.

Province	Public announcements
Eastern Cape ⁴¹	<ul style="list-style-type: none"> • Early involvement in hemp pilot • Feb 2020 – approved setup of a cannabis college (process underway at Lusikisiki College) • Providing production inputs to 26 hemp permit holders in the province (2021) • Draft E Cape cannabis plan completed, but not yet publicly released • ECRDA commissioned a legal review and development of recommendations on a more enabling regulatory environment
Gauteng ⁴²	<ul style="list-style-type: none"> • Mobilising financial resources for producer and industry development (grants, loans, blended finance) • Investor attraction plan for seeds and inputs • Prioritisation as one of top 10 growth sectors • Cannabis Industrialisation Plan • Levers identified: Access to leases of state-owned or controlled land for cannabis production; tenancy in Special Economic Zones; financing partnerships and collaborative funding; structured intergovernmental collaboration to manage regulatory barriers • Request for partnership proposals for Cannabis industrialisation issued in April 2022
KwaZulu-Natal	<ul style="list-style-type: none"> • Early support through participation in hemp pilot production and Dube TradePort greenhouse tenant – House of Hemp • Provincial Cannabis Committee established in March 2022 with intention to finalise a provincial master plan for hemp including rural economic development and farmer support (other aspects such as medical cannabis excluded)
Northern Cape	<ul style="list-style-type: none"> • Private investment by JSE-listed Labat announced in 2021⁴³ but no clear provincial plan available in public domain
North-West ⁴⁴	<ul style="list-style-type: none"> • Establishment of Cannabis Development Council • Establishment of provincial task team
Western Cape	<ul style="list-style-type: none"> • <i>Hemp hub</i> facilitation by W C Department of Environmental Affairs and Development Facilitation (WhatsApp group and information sharing)

⁴¹ <https://www.dispatchlive.co.za/news/2021-04-29-eastern-cape-allocated-r45m-to-develop-cannabis-industry/>

⁴² <https://www.foodformzansi.co.za/the-cannabis-market-is-booming-and-gauteng-wants-in/>;
<https://www.gauteng.gov.za/Services/GetServices?serviceId=CPM-001856>;
<https://www.gauteng.gov.za/Departments/DepartmentPublicationDetails/0AFCADCC-1185-40D3-8A10-836C68C0DAA5?departmentId=CPM-001000>

⁴³ <https://businesstech.co.za/news/trending/492103/jse-listed-labat-acquires-r11-25-million-stake-in-northern-cape-medical-cannabis-producer/>

⁴⁴ <https://www.foodformzansi.co.za/high-expectations-north-west-joins-the-cannabis-race/>

Province	Public announcements
	<ul style="list-style-type: none"> • Cannabis industry investment publication by Wesgro • Note: Also municipal-level initiatives within the province e.g. Green Cape study underway for City of Cape Town, Drakenstein Municipality cultivation trials for hemp for fibre and hemp seed oil applications

Potential implications and remaining questions:

Provincial governments are already using of a range of levers which might provide inspiration and lessons for the Western Cape, including:

- Creation of councils and forums
- Information sharing
- Support for regulatory compliance
- Access to government owned or controlled land and SEZ tenancy
- Research and development
- Facilitation of access to grants
- Mobilising finance through partnerships
- Public procurement
- Legal work and advocacy
- Intergovernmental coordination
- Partnership agreements

Further research and consultation are required to understand the extent of effective implementation of these announced plans, as well as the lessons from implementation to date.

9 What support gaps might match W. Cape mandates and capabilities?

The table below provides an initial analysis of potential support gaps and where Western Cape role players might have relevant mandates and capacity, as well as initial thinking on what the focus of the support could potentially be. These initial thoughts will be refined during the rest of the project through further research, input through stakeholder and role player engagements, brainstorming with the Project Steering Committee, and assessment against agreed prioritisation criteria in line with an overall theory of change.

Support areas identified in National Cannabis Master Plan	Likely gap in support from national government?	Areas where W. Cape players have mandate/ capacity (both government and other role players)
Effective regulatory systems	Yes	<ul style="list-style-type: none"> • Potential advocacy and specialist legal input role to ensure national, provincial and municipal laws, by-laws and regulations support the development of the existing and future cannabis and hemp industries. Clear policy declarations from leadership can play an important role in guiding the process across departments. • Also scope for regulatory compliance support and red tape reduction (linked to existing red tape reduction unit)
Sustainable seed supply systems	Yes	<ul style="list-style-type: none"> • Including focus on landrace seed saving, IP protection and cultivar research to bring local genetics into the mainstream of the industry. • Capability within Elsenburg, ARC based in the W. Cape, universities, municipal initiatives and private research and seed supply companies.
Research, development and innovation	Yes	<ul style="list-style-type: none"> • Enabling collaborative research and development, respecting intellectual property whilst ensuring that the results benefit all the people of the province. • Many institutions formally hesitant to work with Cannabis now being enabled through hemp and medicinal Cannabis guidelines and regulations. Collaboration needs to be facilitated and encouraged. • Capability within Elsenburg, ARC based in the W. Cape, universities, municipal initiatives and private R&D, genetics and biotechnology companies
Producer support systems	Yes	<ul style="list-style-type: none"> • Relevant mandates and capacities exist in organisations such as Casidra. Potential for expansion of extension officer programme through inclusion of cannabis and hemp. Training support needed – private sector readiness is already established.

Support areas identified in National Cannabis Master Plan	Likely gap in support from national government?	Areas where W. Cape players have mandate/ capacity (both government and other role players)
		<ul style="list-style-type: none"> Likely to be need for support for international certification e.g. EU GMP, but this has high-cost implications. Also potential support as has been done in other provinces through levers such as access to publicly owned or controlled land for production and processing, provision of inputs and regularisation of pre-existing production, facilitation of grant access investment attraction, partnership agreements.
Market development	Yes	<ul style="list-style-type: none"> Relevant mandates and capacities in organisations such as Wesgro and sector bodies such as Green Cape. Potential scope for market development through public procurement.
Enterprise and supplier development	Yes	<ul style="list-style-type: none"> Some established capacity in the WC for enterprise and supplier support. Public – private initiatives could be established. Cooperatives systems could be encouraged through training and implementation support. Initiatives to support informal production to benefit more from the mainstreaming and commercialisation of industries. Scope to integrate into Special Economic Zone support initiatives. Scope for a “Kasinomics” approach to include the current informal market consumers and producers of cannabis and CBD products into the regulatory net. Focus could be on product safety and traceability, with support needed to develop appropriate technological interventions to enable and simplify compliance.
Manufacturing and product development	Yes	<ul style="list-style-type: none"> Wider innovation, R&D and design capabilities in the province in the private, university and non-profit sectors that could be tapped into. Investment would be needed in specialist product development in potentially competitive areas of the hemp value chain (with private sector involvement). Hemp processing plants are beyond the reach of most individual private sector players. Current white label manufacturers can be supported to develop market ready cannabis and hemp products to support the wider industry to grow.

Support areas identified in National Cannabis Master Plan	Likely gap in support from national government?	Areas where W. Cape players have mandate/ capacity (both government and other role players)
Education and training	Yes	<ul style="list-style-type: none"> Some existing specialist cannabis education and training capability already in the province and a strong wider education and training ecosystem that can be tapped into, including both public and private universities, colleges and short course providers.
Communication and awareness	Yes	<ul style="list-style-type: none"> Relevant mandates within the province related to health and wellness awareness. Also significant communication capacity within civil society, industry bodies and media organisations. Community roll out of programmes is established on localised level and can be leveraged and coordinated.
Industry organisation and coordination structures and mechanisms	Yes	<ul style="list-style-type: none"> Mandate within the National Cannabis Master Plan for provinces to establish coordination bodies. Scope to constitute a representative and transformation cannabis and hemp industry development council/ forum, with representation across government, industry, community, academia/research. Current lack of coordinated effort from the fragmented existing Cannabis Industry to form an inclusive and well-represented Industry body. Once this body established it will be easier for Government to engage with industry.

Potential implications, hypotheses and remaining questions:

There are likely to be a range of support gaps that link to provincial mandates and the capabilities of role players based in the Western Cape. Prioritisation will be required given both resource limitations and the lack of optimal growing conditions in the Western Cape presenting a constraint to massive scaling of the socio-economic impact.

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