Western Cape Government

FOR YOU

Agriculture

Cannabis Framework and Implementation Plan (CanPlan) for the Agricultural Sector

Development of the Western Cape Cannabis Framework and Implementation Plan (CanPlan) for the agricultural sector

Final report

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Executive Summary

The Cannabis and hemp value chain has **significant potential** to contribute to the economic, social and environmental objectives of the Western Cape. However, the value chain is also characterised by **high uncertainty**. Regulatory, market and production uncertainties exist both within South Africa and internationally, most of which are outside of the direct control of provincial role players. This will impact on both the types and scale of opportunities accessible to the Western Cape economy, and the extent to which the industry can contribute to objectives such as job and livelihood creation, export growth, inclusion and transformation, food security, housing and health. It is therefore essential to support the Cannabis and hemp value chain in a way that is highly adaptive and responsive to changes.

The Western Cape has a significant **asset base and activity to build on**. Within the Cannabis and hemp value chain, small-scale growing, processing and cultural knowledge of healing applications go back many hundreds of years, integrated into Khoi, San and Rastafari traditions. More recently, activity has grown across a diversity of value chains in both the regulated and grey space (medicinal, natural and traditional health, food, beverages, construction using hemp fibre, recreation and tourism etc.). There are also a range of assets and advantages that could strengthen the competitiveness of the value chain, including research, biotech and testing capability, IT and logistics, brand building, agriculture and agri-processing infrastructure, experience competing in highly regulated industries (e.g. alcohol), relatively aware local consumer markets, as well as competitive end use industries that Cannabis and hemp inputs feed into (such as agri-processing exports, property development, and marine manufacturing). However, there are also **numerous provincial constraints**, notably that Western Cape **growing conditions** are not optimal for current Cannabis and hemp varieties without modification, in particular in terms of rainfall and light level, which makes growing less competitive.

The following **recommended initiatives** would lay the foundation for an adaptive approach, and link into the Cannabis Master plan pillars.

WCDOA lead	**Other lead institutions**
1. Industry stakeholder coordination and problem-solving mechanisms 2. Information sharing and decision support (crop selection, product focus, suitable locations for growing and primary processing) 3. Extension, production, and processing support services to mainstream legacy and informal producers and agri-processors 4. Collaborative research/ trials on suitable varieties 5. Research and promotion of Cannabis/hemp as rotation crop as part of improved environmental/ regenerative practices 6. Evaluate measures to protect and promote unique WC hemp and cannabis characteristics	1. Overall inclusive industry value chain representation 2. Education and training, awareness raising with public, schools, decision-makers, medical professionals 3. Western Cape brand development, certification/standards compliance 4. Effective, evidence-based advocacy and red tape reduction 5. Cannabis and hemp investment support and facilitation 6. Networking and innovation with end-use industries in Western Cape 7. Cannabis tourism support 8. Provincial and local public procurement market activation (health, human settlements, education etc.) 9. Assessment and activation of role of Cannabis and hemp in environmental remediation, including on depleted farmland

Technical Summary

The table below summarises the typical production requirements for Cannabis and hemp.

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

Growing conditions in the Western Cape are not optimal for existing cultivars of either hemp or Cannabis without a modified environment. In the case of hemp, irrigation would be required in most locations, and supplementary light could be needed to extend growth. The Southern Cape is the only area in the Western Cape somewhat suited to dryland hemp production, although there is still a rainfall shortfall In the case of Cannabis, greenhouse or indoor production would be required. These sub-optimal growing conditions would mean higher input costs. This is likely to impact the competitiveness of primary production relative to other growing locations in both Southern Africa (e.g. Pondoland, KZN, Lesotho, Malawi, Zimbabwe, and Mozambique) and globally (e.g. Colombia, Thailand). This may change if new varieties are developed that are better suited to Western Cape growing conditions.

Economics and pricing within the value chain are also changing rapidly. For example:

- **Medicinal Cannabis pricing** internationally and locally has been dropping significantly as the industry formalises, and significant production comes on stream. Lower cost production locations such as Colombia and Lesotho are entering export markets.
- **Hemp fibre** has a very low **value to weight ratio**, and so the economics of aggregation of fibre and intermediate fibre for processing is highly affected by fuel and logistics costs. In some cases, local end use industries are not considering a premium for hemp over other less sustainable materials (e.g. textiles and clothing). In other cases, higher prices can be secured because of the technology or expertise required (e.g. automotive components).

Cannabis producers focus only on the flower output, and the viability of their economics is dependent on that single output. In the case of hemp there are a range of potential outputs. There is a misconception that hemp producers can focus on all outputs of the plant simultaneously (fibre, seed, biomass etc). It is possible to have an initial leaf crop (or thinning out leaves on the main crop) to yield an initial leaf harvest for fodder or fresh food. After that there will need be a focus on either fibre or seed outputs, as the plant husbandry approach will be different – spacing, thinning, time to harvest etc. Different specialist fibre or seed varieties could also be planted. Hemp typically has a biomass water content of about 20%, and 20 to 40% of the biomass of the hemp is fibre.

In order to compete effectively, the Western Cape would therefore need to leverage other advantages around the production environment, and/or focus on other aspects of the value chain with a stronger competitive advantage. Provincial strengths and positioning could relate to:

- Health, healing and wellness based on traditional and cultural knowledge, natural products and innovation
- Knowledge, information and technology
- Brand building and marketing
- Logistics, retail and distribution infrastructure, systems and expertise
- Processing linked into competitive and high growth end use industries such as food, beverages, biotech, marine manufacturing and boatbuilding, construction and property

Many of these positioning areas also link to wider provincial strategies and priorities which could be mutually reinforcing e.g. Western Cape SmartAgri, Investment, and Growth for Jobs plans and strategies. As some opportunities currently fall within the "grey" regulatory space, possibilities could unfold over time as regulation is updated.

Given this high level of uncertainty, it is recommended that the strategic approach is adaptive, starts with foundational initiatives, and can shift based on triggers of changes to the national and global regulatory and market context.

WCDOA areas of influence within this theory of change, that could provide a foundation for growth, inclusion and transformation include:

Recommended initiatives	Potential role players/ champion	Timeframe
1. Establish industry stakeholder coordination and problem-solving mechanisms (industry-province forum, possibly also commodity group)	WC DOA strategy Hortgro, Cannabis Community Council	Short-term
2. Information sharing and decision support (crop selection, product focus, GIS analysis of suitable locations for growing and primary processing)	WC DOA alternative crops, GIS unit/Cape Farmer Mapper	Short-term
3. Extension services and production support for mainstreaming of legacy and informal producers and agri-processors	WC DOA extension services, Elsenburg SABS Private certification bodies,	Short-term
4. Collaborative research/ trials on suitable varieties	WC DOA alternative crops Elsenburg, ARC	Short- and medium-term
5. Research and promotion of Cannabis/hemp as rotation crop as part of improved environmental/ regenerative practices	WCDOA, Elsenburg, WC DE&DP	Short- and medium-term
6. Evaluate measures to protect and promote unique WC hemp and cannabis characteristics (indigenous and traditional knowledge, trademarks, collective marks, GI)	WCDOA Wesgro Donor partners	Short- and medium-term

Initiatives where other provincial role players could lead in providing a foundation for change include:

Recommended initiatives	Potential role players/ champion	Short-term or medium term
1. Education and training, awareness raising with public, schools, decision-makers, medical professionals	Industry structures, THP WC, TNPA, Happy by Nature, Sustainability Institute WC Dept of Education and Social Services, local municipalities, Green Cape	Short-term
2. Western Cape brand development	DEDAT Wesgro Private brand development partners	Short-term
3. Effective, evidence-based advocacy and red tape reduction	DEDAT red tape unit, Office of the Premier Wesgro legal	Short-term
4. Cannabis and hemp investment support and facilitation	Wesgro	Short-term
5. Networking and innovation with end-use industries in Western Cape	DEDAT, sector bodies (Blue Cape, SAPOA WC, Cape Clothing and Textiles Cluster, Construction industry)	Short-to medium term
6. Cannabis tourism support	DEDAT Tourism Wesgro	Short-to medium term
7. Assessment and activation of role of Cannabis and hemp in environmental remediation, including on depleted farmland	WC E&DP, WCDOA, conservation partners, Cape Nature	Short to medium term
8. Provincial and local public procurement market activation (health, human settlements, education etc.)	DEDAT WC Depts of Health, Human Settlement, Education Local municipalities	Medium-term

1 Introduction and purpose

This report captures the final findings and recommendations of the Western Cape Cannabis Framework and Implementation Plan (CanPlan) for the agricultural sector. It is intended to inform the decision making and strategic planning of the Western Cape Department of Agriculture and other role players.

The findings are based on research and analysis, the guidance of the Project Steering Committee, as well as the extensive input from role players through one-on-one engagements and multiple working sessions.

2 Status quo assessment

This chapter highlights key issues in the status quo that impact on the possibilities of the Cannabis and hemp value chain for the Western Cape. Further detail is available in the literature review report.

2.1 *Policy, legislative and regulatory context*

The policy, legislative and regulatory context is changing rapidly both in South Africa and internationally, as attitudes and associated policies shift towards medical and recreational Cannabis, as well as industrial hemp.

One of the key characteristics of the legislative and regulatory landscape is its transversal nature. Regulation of the Cannabis species falls across the Departments of Health and Agriculture depending on the THC levels of the plant (which vary across strains/variety of the plant may change during the growing cycle. Landrace species that have traditionally been grown as dagga rather than industrial hemp have relatively low THC levels. Historical drug regulation means that policing, justice, crime prevention, drugs and drug trafficking legislation have also been involved to date; many stakeholders are advocating towards regulation of Cannabis moving towards treating it as a "normal" plant crop.

In addition, given the diversity of end uses, regulation spans across the fields of medical and pharmaceutical, alternative and natural health and traditional healing, indigenous knowledge, traditional rights and cultural uses, cosmetics, food and beverages, environmental services and carbon trading, and industrial standards for end use industries in construction, automotive, textiles, marine engineering and boatbuilding.

The table below provides an assessment of activities, products and services that - based on available information to date - are permitted under current South African regulation, or are considered grey, illicit, or are not enabled by regulation.

Activities, products and services permitted under current legislation and regulation	Enabled by:
Medical Cannabis	Medicines and Related Substances Act, Cannabis licence process
Hemp growing for fibre and seed	Plant Improvement Act, hemp permit
Cannabis seed import	Medicines and Related Substances Act, Cannabis licence process
CBD medicine/health products below 20mg daily dose/600mg sales pack	Medicines and Related Substances Act, Cannabis licence process; SAHPRA Registration of Medicines: Complementary Medicines – Guidance on Specific Substances: Cannabidiol (CBD); SAHPRA regulatory notice "Exemption Of Certain Cannabidiol Products From The Operation Of The Medicines Act"
Small-scale growing and consumption for private use	Constitutional Court ruling
Traditional and cultural use of Cannabis, traditional healer use	Plant Breeders Rights Act, Indigenous Knowledge Systems Act; Traditional and Khoi-San Leadership Act
Processing of intermediate hemp fibre and textiles	Plant Improvement Act, hemp permit
Foods containing hemp seed or oil	Agricultural Products Standards Act
Export of products	Medicines and Related Substances Act, Cannabis licence process; Plant Improvement Act, hemp permit; Marketing of Agricultural Products Act Agricultural Products Standards Act
Medical Cannabis tourism	Medicines and Related Substances Act, Cannabis licence process, Section 21 approval
Cannabis/hemp agritourism	Medicines and Related Substances Act, Cannabis licence process; Plant Improvement Act, hemp permit
Ancillary services e.g. analysis and testing, research, logistics, brand building	Medicines and Related Substances Act, Cannabis licence process
Financing by venture capital/international investors	

"Grey area" opportunities	Constrained by:
Local Cannabis and hemp seed registration and supply	Agricultural Pests Act
Legitimised local landrace Cannabis and hemp	Medicines and Related Substances Act, Cannabis licence process
Pharmaceutical and health products with CBD daily dose over 20mg	Medicines and Related Substances Act, Cannabis licence process; SAHPRA Registration of Medicines: Complementary Medicines – Guidance on Specific Substances: Cannabidiol (CBD)
CBD-containing food, beverages, cosmetics, personal care	Foodstuffs, Cosmetics and Disinfectants Act, schedules Agricultural Products Standards Act Drugs and Drug Trafficking Act
Imported THC/CBD containing products, not certified	Drugs and Drug Trafficking Act

Animal feed and pet food from hemp / Cannabis	[Pending Feeds and Pet Food bill]; Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act,
Phytochemical processing under hemp license e.g. CBD	SAHPRA notice interpreting Plant Improvement Act, hemp permit
Products with higher THC levels	Medicines and Related Substances Act, Cannabis licence process
Recreational Cannabis (commercialised), including grower and consumer clubs	Drugs and Drug Trafficking Act, Prevention of Organised Crime Act, Criminal Procedure Act, UN Declaration …
Hemp fibre sector applications standards e.g. building/construction, marine	Construction: National Building Regulations and National Building Regulations and Building Standards Act. SANS10400 Boatbuilding: ISO, South African Bureau of Standards (SABS) for the Boat Building Industry via Technical Committee 188, SAMSA; MERCHANT SHIPPING (NATIONAL SMALL VESSEL SAFETY) REGULATIONS, 2007, MATRIX OF COMPULSORY VESSEL REGULATIONS AND POLICY LINKED, TO ISO/SANS (NON-COMPULSORY) DESIGN STANDARDS
Recreational Cannabis tourism	[Pending Private use Bill] Drugs and Drug Trafficking Act, Prevention of Organised Crime Act, Criminal Procedure Act, UN Single Convention on Narcotic Drugs; Convention on Psychotropic Substances United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances
Local bank financing / investment in a Cannabis business	Drugs and Drug Trafficking Act, Prevention of Organised Crime Act
Involvement of people in the industry with historical legal/criminal cases against them for previous activity in the industry	Drugs and Drug Trafficking Act, Prevention of Organised Crime Act, Criminal Procedure Act

Many Western Cape role players are already actively involved at the national level in advocating for regulatory change. Some changes are expected to take place in the short term e.g. the Private Use Bill, adjustment of schedules of the Foodstuffs, Cosmetics and Disinfectants Act, standards updating by the SABS Technical Committee on Hemp and Cannabis Industry. These changes could open up opportunities into the "permitted" space for the Western Cape, namely recreational Cannatourism, as well as food and beverages containing CBD.

Through these various advocacy efforts and engagements at a national level, a range of other regulatory issues have been noted that are impacting on the ease of operation, inclusion, and growth prospects for the value chain. Some key issues include:

- Hemp permit – uncertain timeframes for processing, process of securing clearance from police, 50-hectare limit, need for exemptions to more easily include legacy producers (e.g. exemption zones)
- Cannabis license – requirement to invest and develop facilities at high cost before being able to secure the license (e.g. no conditional approval subject to

meeting requirements), local GMP requirements not currently internationally accepted e.g. EU GMP

- 0.2% THC threshold between hemp and cannabis difficult to administer and test (changes during life cycle of the plant), and legacy growers fall in an unrecognised middle ground
- Continued scheduling of CBD (exemption approach being followed rather than removing the scheduling altogether)
- Streamlining required of the process for medical doctor and patient to prescribe and access medicinal cannabis

The international regulatory context is also uncertain, with changes taking place in relation to THC level limits, responsible adult use, requirements for imports etc.

2.2 *Growing requirements and fit with Western Cape conditions*

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. For medical Cannabis exports, it is typically grown 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 harvesting[1]. 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 2: 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

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. Short day length area can stimulate the plants to go into the reproductive stage prematurely, which can result in lower fibre yields.

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

The Southern Cape is the only area in the Western Cape somewhat suited to dryland hemp production, although there is still a rainfall shortfall. A recent informal dryland production pilot on the Garden Route did not succeed due to rainfall shortages, as it had been a dryer than usual year. Further research and trials are expected by the ARC, which may support identification of cultivars that are a better fit for lower water and temperature requirements. Trials elsewhere in the region (Lesotho, Malawi, Zimbabwe) might also be of interest e.g. in terms of drought tolerance.

The need to modify growing conditions will impact the competitiveness of production relative to other locations. The water scarcity pressures in the province, and competition with other irrigated crops, may mitigate against irrigated production, although in some cases there could be scope to leverage existing infrastructure, and substitute hemp for higher water demand crops e.g. lucerne. 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.

As lower mean day temperature and the frequency of overcast conditions can be limiting factors, further research is needed. Lessons could potentially be learned from hops farmers in the Waboomskraal and George area (who used additional spotlights in field), as hops and Cannabis are closely related.

2.3 *Current production and value chain activity in the Western Cape*

An analysis of the **Cannabis production licenses** based on the list available on the SAHPRA website as at October 2022[2], 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.

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 estimated that there are many thousands of small-scale growers[3]. In the Western Cape, traditional communities do nevertheless grow for

[2] https://www.sahpra.org.za/Cannabis-cultivation-licences/
[3] https://www.bbc.com/news/world-africa-62524501

own-use and subsistence in all areas of the Province, with the West Coast, towns 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

Some of these operations are currently experiencing challenges with commercial viability. 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

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 extracts[4], 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 universities[5].

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.

Afrimat[6] 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** (typically with imported CBD extract, 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. 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, and there have been various seizures at the port; challenges are currently in the courts relating to SAHPRA's jurisdiction.

The **home grower market is supported by a range of auxiliary services**. 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.

[5] https://geslabs.com/
[6] https://www.afrimathemp.co.za/hempcrete-and-blocks/

Limitless Reality. **Legal services** companies are also developing specialisation in Cannabis law. There is also an architectural firm specialising in hemp architecture.

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. **CPUT's Applied Microbial and Health Biotechnology Institute** is conducting basic research using a laboratory-based model to assess the modulation of high glucose-induced oxidative stress by various Cannabis sativa plant extracts in liver cells, and has the capacity to provide scientific substantiation of health claims of Cannabis and hemp.

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), as well as the Overberg Training and Development Initiative and U Can Grow.

Cannabis tourism and the promotion of Cannabis-friendly establishments tap into a new and growing market. Some establishments are already offering cannatourism services e.g. Cannabis-themed city tours and 420 friendly camp sites and B&B's. There are also some clubs and dispensaries that are popular with tourists.

Various **investment plans** have been 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)
- Hemp Solutions is seeking funds to invest in fibre decortication, cottonising and hemp seed processing.
- 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, skincare[7].

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 needs acceleration through a targeted approach from government, institutions and the industry.

[7]7 https://www.iol.co.za/lifestyle/food-drink/drink/brewing-company-distell-expands-into-Cannabis-products-e6146d41-cc9b-459c-a05f-debbe1a6c046

Existing facilities in other industries have the potential to support the Cannabis and hemp industry. For example, **irrigation infrastructure** could be utilised. 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. **Pack houses and shed**s could be used for basic processing. 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.

2.4 *Summary status quo assessment*

Positive, mixed and negative factors:

+ Long history and traditions around Cannabis, in particular traditional healers
+ Significant informal and grassroots activity and trade– growing, processing, distribution, trade, services, clubs etc.
+ Base of license and permit holders in the WC
+ Various established value chains in the WC – e.g. food, beverage, construction
+ High level of interest and innovation in Cannabis and hemp
+ Technology available
+ Some coordination of research e.g. within industry
+ Current and planned investments in various types of processing
+ Base of Cannabis and hemp training and education in the province
+ Strong tourism in W Cape (including medical, health and nature-based tourism)
+ Energy assets e.g. solar potential
+ Sophisticated and aware local consumer base, environmentally conscious
+ Provincial government strengths – reputation for service delivery, being responsive and pro-active relative to other SA provinces, clean audit, agri value chain expertise

± Environmental imperatives (risk and opportunity)
± Rapidly evolving regulatory landscape locally and internationally
± Rapidly changing markets (risk and opportunity)
± Existing (or lack of) seed IP and registered cultivars (ARC)

− W. Cape growing conditions not optimal for production without modification (incl. irrigation, light, temp) although parts of Southern Cape more suitable
− Fragmented and unclear regulation
− Fragmented industry, no representative industry body
− Lack of coordination of – and access to - all research efforts, including academic, public sector, state research (e.g. CSIR)
− Gaps in value chain facilities/processing capability
− Exclusion of much of legacy activity from permitted space
− Water scarcity and climate change
− People generally not well educated about Cannabis
− Gaps in youth-focused and female-driven institutions
− Inadequate small farmer and entrepreneur support

– Wine industry dynamic (competition for land, water and support resources, environmental practices can damage other agricultural activity)

Assets by type:

PEOPLE AND CULTURE

- Long tradition and culture with Cannabis plant, other plant medicines/natural products
- Traditional knowledge – production, formulation, healing
- Love and passion for Cannabis plant amongst many people
- Relatively aware and conscious market, sophisticated local consumer base, aware of wellness, healing, health
- Existing commercial and strategy skills around Cannabis and hemp
- Global association of Africa, SA, to some degree WC, with Cannabis
- Diverse expertise that is relevant – Cannabis production, wider agri production and agri-processing for export, knowledge how to compete in regulated industries (e.g. alcohol), financing, brand building and marketing, IT. Logistics, biotech

FACILITIES, INFRASTRUCTURE

- Existing areas of irrigation and water
- Relevant existing agri-processing capacity e.g. extracts
- Competitive value chains and end use processing capability and market linkages e.g. food, beverages, textiles, boatbuilding
- Labs, analysis and testing facilities
- Natural products coops, consolidation, logistics systems
- Wider tourism infrastructure and facilities (agri and wine tourism, food tourism, leisure and lifestyle tourism, heritage and culture
- Well-maintained road infrastructure

SUPPORT / INSTITUTIONAL CAPACITY

- Research capacity and academic institutions e.g. universities, Dept of Agri and ARC crop testing, R&D in public and private
- Education and training support base
- Agri extension and farmer support capacity
- Trade and investment promotion capacity
- Enterprise support
- Relatively well-functioning municipal support
- Information sharing systems e.g. Hemp hub, Cape Farm Mapper, planned alternative crop assessment decision support system
- Relevant industry cooperation and support e.g. agriculture, horticulture, natural products, traditional healers and medical practitioners, WC Cannabis coop, Cannabis traders, hemp hub

For more detail see PESTOLE and risk analysis in Appendix A.

3 Role player map

A diversity of role players is involved in the Cannabis and hemp value chains and the associated regulatory and support environment. As an emerging industry with a long history in the traditional, cultural, informal and "grey" market, and newer activities in the commercial and formal sector, role player dynamics are complex and have been fragmented.

For the purposes of role player mapping, the following categories have been used:

- Certification and testing
- Distributor/exporter
- Education and training provider
- Finance provider
- Government (including policy makers, regulators and implementation support providers)
- Industry association
- Non-profit / Community based organisation
- Producer /business
- Research

The diagram on the following page provides a map of role players (Western Cape focused but including national regulators) organised by roles in the value chain.

Many of the role players in the province are also active at the national level, including driving advocacy and lobbying for regulatory and policy change.

Inputs, genetics
- Seed companies

Private / non-profit education & training
- Cheeba Cannabis Academy
- Overberg Training and Development Initiative
- Happy by Nature/ Sustainability Institute
- U Can Grow

R&D, Innovation, product development
- Clinical trial organisations e.g. Cannabis Research Institute

Analysis, testing, certification
- Qure Analytics
- GES Labs
- Afriplex
- VinLab

Primary producers
- Informal & legacy producers
- WC cannabis license holders
- Cannabis Industry Development Cooperative WC
- Cannabis Trade Association
- WC hemp permit holders
- Hortgro
- AgriWC
- African Farmers Association

Processors
- Large and smaller processors of food, cosmetic, personal care, hempcrete
- Afristar Foundation
- Magic Group
- Cannabis Community Council
- Fields of Green for All

Marketing, brand building

Private finance, investment
- FNB
- RMB
- Investec
- Silverleaf
- Alt Exchange
- Private equity firms

Logistics, distribution, value chain dev retail, trade, branding
- Limitless Reality
- Hemporium

End user associations and communities
- AFMA
- Cape Clothing & Textiles Cluster
- Blue Cape
- FEDHASA, SATSA
- Traditional Healers Organisation WC
- Traditional & Natural Health Alliance
- Rastafari community

Public research
- Universities – UWC, CPUT, UCT, SUN, NMMU George Campus
- ARC
- CSIR

Public education & training
- Elsenburg College

Policy makers
- Office of the Premier
- Provincial line depts – Agri, DEDAT, E&DP, Health
- Office of the President
- National line depts – dtic, Health, Agric

Information sharing & promotion
- Green Cape
- Wesgro
- National Agricultural Marketing Council

Red tape reduction

DFIs
- IDC
- SEFA
- NYDA

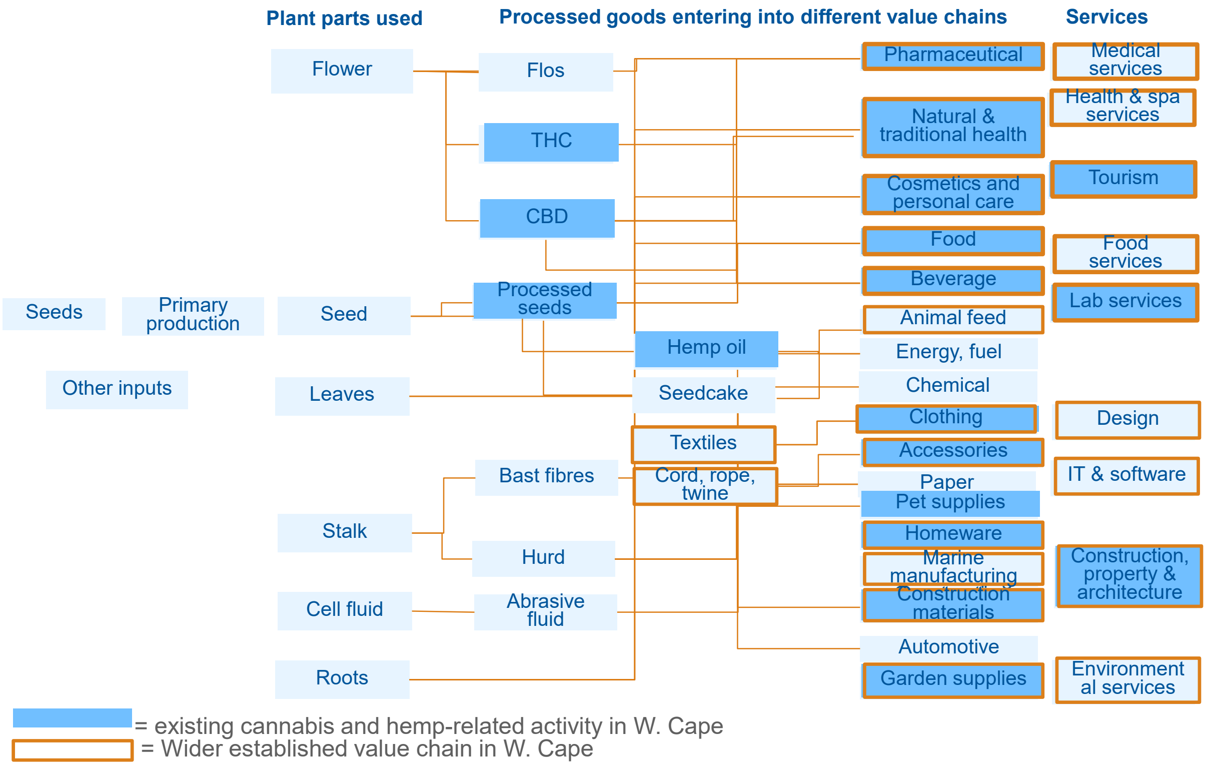
Regulators
- SAHPRA
- National Plant Protection Authority of SA (NDA)
- Dept of Health Food Control Unit

Implementers/support/ development services
- TNPA
- SAPS, Local police
- Provincial line depts – Agri, DEDAT, E&DP, Health
- Cape Nature
- District & local municipalities
- SEZs
- Wesgro
- CT Tourism

4 Value chain, competitor and market analysis

4.1 *Value chain analysis*

The diagram below provides a summary of the value chain in terms of how various outputs of the Cannabis and hemp plant feed into different processed goods and end use industries.



The wider established value chains are likely to create opportunities for differentiation and competitiveness for the Cannabis and hemp value chain in the Western Cape.

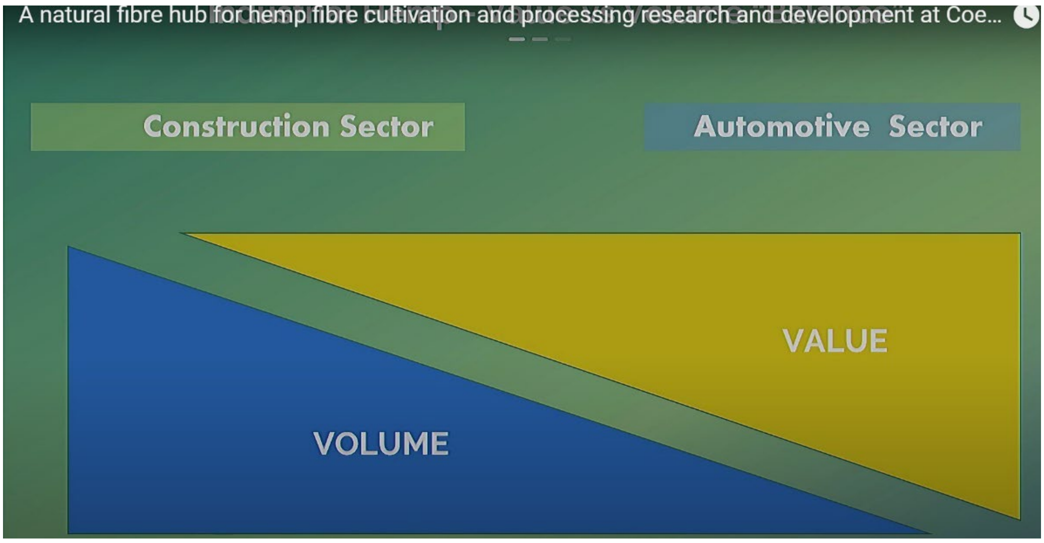
It is also useful to think of the value chain in terms of the various yields of the plant, and the pricing of these outputs. Biomass water content is about 20%. A summary of information gathered to date from research and interviews is shown in the table below.

Table 3: Available information on yields and pricing

	% of biomass	Yield / ha? (tonnes)	Price per kg /l (2016)	Price per kg (2022)
Hemp				
Fresh leaves		~ 20	R3.50	
Stalk Hurd fibre Bast fibre	20 to 40%	~5 to 11 (dried)	 R9/kg R6/kg	R2.50 to R30
Seed				
Unprocessed seed		~1.5		R22/kg
Hulled seed			R115/kg	
Seedcake			R50/kg	
Oil			R100/l	R10/l for biofuel
Cannabis				
Dried Cannabis flower		~ 2	-	R3000 SA Europe Euro 2 / gram EU GMP certified (~R37 477,28)

See also the interactive cost and returns model in Excel format available separately.

In the case of hemp fibre processing, some outputs are high volume, lower value (such as basic construction materials, while others are higher value (e.g. automotive components), as shown in the extract from a recent presentation at the CSIR conference by the Natural Fibres Hub (CSIR/Coega). The Natural Fibre Hub has argued that the current low volumes of available fibre make the high value automotive segment more suitable in the short-term for their activity, and they therefore have a strong focus on non-woven technologies alongside decortication and cottonising.



4.2 *Competitor and market analysis*

The Cannabis and hemp competitor and market landscape is changing rapidly and is highly uncertain. Some of the key trends are set out below.

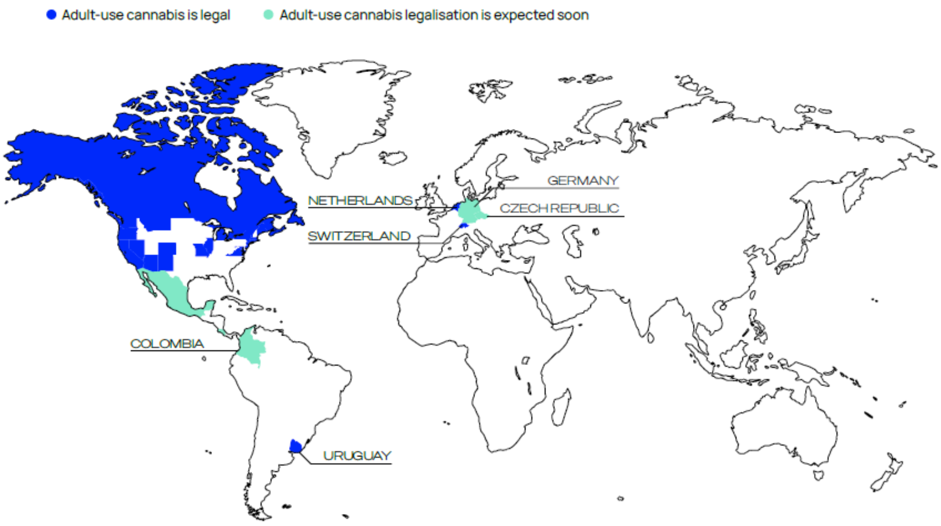
Global regulatory shifts are towards acceptance of Cannabis and hemp

- The general direction of regulation is towards more openness to Cannabis and hemp production, processing and trade
- Cannabis regulatory changes started with medical Cannabis, but are also expanding into responsible adult use (e.g. Canada, Uruguay, and soon Germany), see maps below
- However, the pace of change is unpredictable, and has been slower than some industry had been expecting

Figure 1: Maps of countries where medical and responsible adult use is legal

Medical

Adult use



Source: Prohibition Partners, Global Cannabis Report, 3rd edition, December 2022

Production patterns are changing rapidly, with shifts to lower cost locations for both Cannabis and hemp:

- As regulation shifts and legal trade becomes more possible, production investments are taking place in lower cost locations
    - For example, significant investments have been made in Lesotho in medical Cannabis for export (they are estimated to have attracted 70% to 90% of the FDI into Cannabis in Africa to date), in partnership with a German distributor; the MG Health EU GMP facility is already exporting to Europe.
    - Colombia has also expanded production to supply both the regional market and Europe, conditions are highly suited to outdoor Cannabis growing at very low cost,
- 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 expected that this mechanism could be removed in time.

As a result, pricing is highly volatile and there are cases of overproduction, collapse and consolidation:

- Whilst numerous companies are investing on the assumption of these regulatory changes taking place, the **actual import market growth has been slower than expected** for many markets. The **installed capacity for medical Cannabis, along with confirmed investments, already far exceeds the current formal market**.
- Medical Cannabis pricing is on a downward trajectory because of the oversupply trend and shift to lower cost locations.
- There are resulting **consolidations and disinvestments** e.g. Canopy Growth (largest Cannabis company in the world by balance sheet for a long time) invested CanadianS$28m in Lesotho, but has since withdrawn to focus on home market/regional markets of Canada and US
- After the Farm Bill made hemp growing legal in the US, many small farmers invested and started producing. Production boomed initially, prices dropped, and many farmers had their fingers burned.

Environmental imperatives are driving hemp use:

- Hemp requires **less water than many other natural fibres**, and can be grown with no herbicides or pesticides, which makes it an excellent candidate as a **substitute textile**
- **Carbon capture benefits**: With its rapid growth, hemp has a very high carbon capture measure. Hempcrete is carbon negative, drawing carbon out of the atmosphere

- Various **innovations** are widening the environmental potential e.g. hemp plastics and composites, hemp wood substitute.
- Hemp also has potential for **soil improvement and environmental remediation** (e.g. on mine sites and polluted land)

5 Opportunity and gap assessment

As growing conditions in the Western Cape are not optimal, it is likely that the majority of opportunities in the Cannabis and hemp value chains for the Western Cape will relate to other competitive strengths. However, as indicated elsewhere in the draft report, the opportunity landscape is highly dynamic as many potential areas of opportunity for the Western Cape are currently in the grey regulatory space. Potential opportunity areas are summarised in the table below:

Currently permitted	**Not currently enabled by local regulation**
• Medical Cannabis for export • Seed propagation • Hemp intermediate fibre (bast and hurd, cottonised fibre, non-wovens) • Traditional medicine and natural health and wellness products and services (whole plant, THC, CBD) • Brand building (African Cannabis and hemp brands) • Cannabis and hemp retail, distribution and logistics • Medical Cannatourism and agri-tourism • Specialist IT, technology, packaging and labelling • Hemp clothing and accessories • Food products (local and for the region) • Lab analysis and testing • Hemp for environmental remediation	• CBD-containing food and beverages (alcoholic and non-alcoholic) • Fodder, animal feed, pet food • Recreational Cannabis tourism • Hemp construction materials and housing, boatbuilding components (gaps in industry standards)

In addition to the regulatory gaps, there are also significant gaps in facilities, infrastructure and support, including:

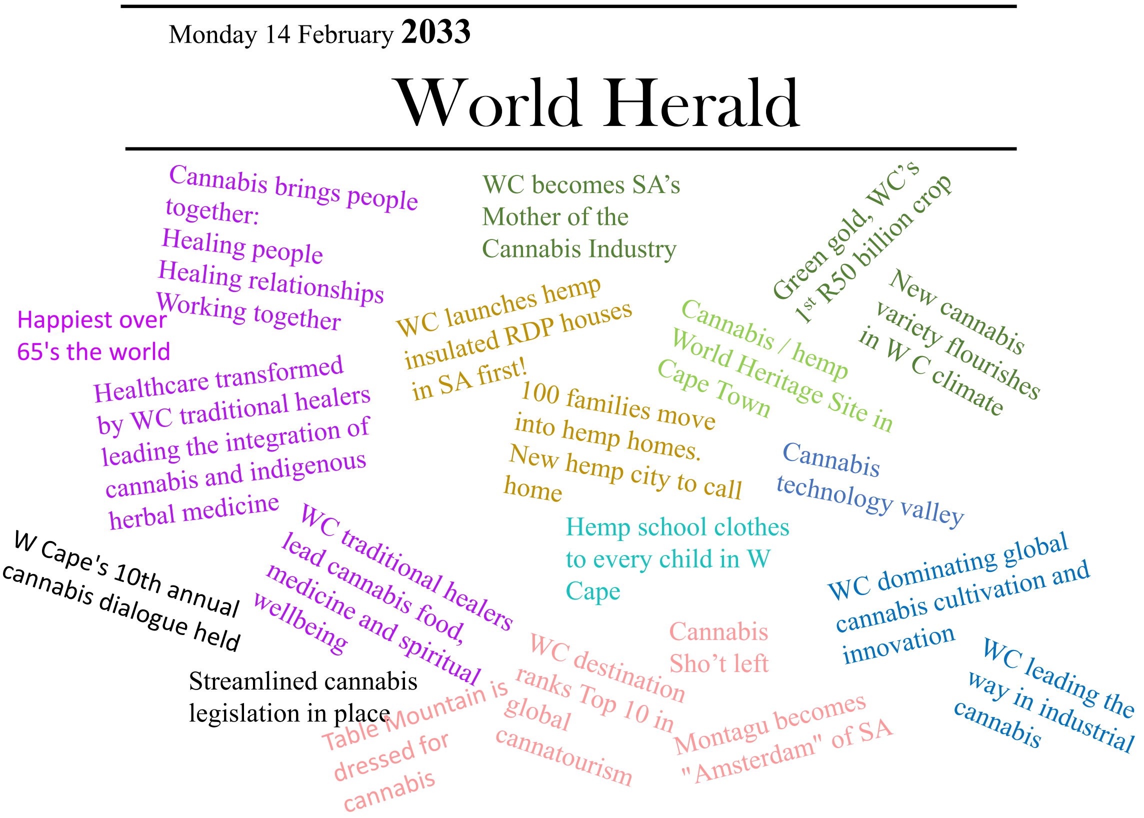
- Information and knowledge amongst the public, practitioners, industries and decision-makers about Cannabis and hemp
- Shared hemp processing facilities (certified)
- Small producer and processor support (financing, aggregation, product formulation)
- Supply chain integration (in particular for hemp fibre value chain, which would need to be in cooperation with other provinces)

Each of these opportunities has a range of considerations for the Western Cape to which may impact competitiveness and scale of the opportunity (*see Appendix B*)

6 Theory of change and assessment of potential initiatives

6.1 *Vision and positioning*

The participants in the working sessions on 24 January and 1 February 2023 contributed ideas on ideal "headlines for the future" if the Western Cape Cannabis and hemp industry was thriving by 2033, see results in the image below:



These "headlines" provide some inspiration of possibilities for the Western Cape hemp and Cannabis vision. Key themes in the vision and positioning based on both this exercise and the previous research and stakeholder input include:

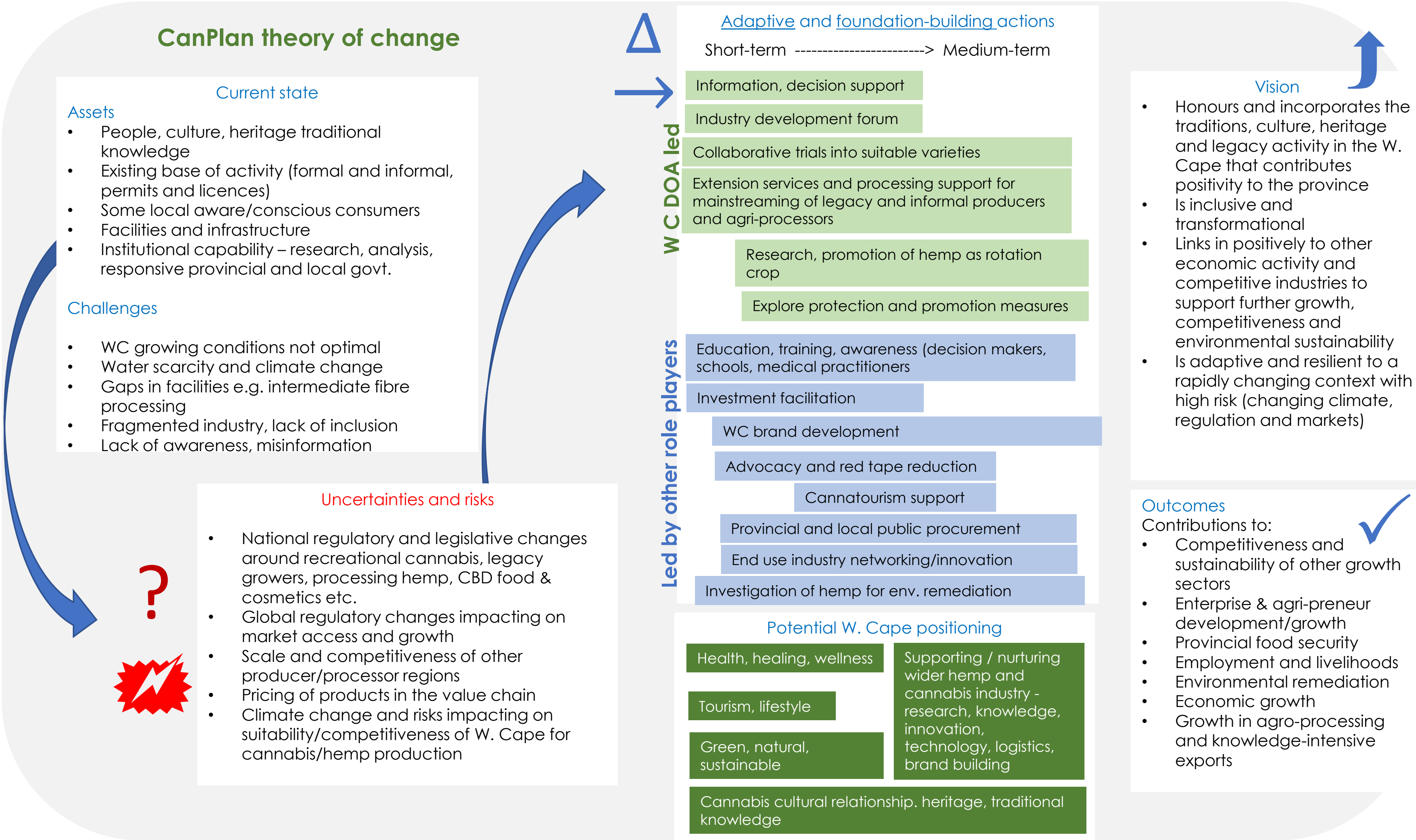
- Health, healing, wellness
- Building on, celebrating and honouring Western Cape Cannabis cultural relationship, traditional healing knowledge and heritage
- Contributing to social issues – housing, food security, schools, social cohesion
- Green and natural, contributing to environmental sustainability
- Linked to knowledge, innovation, technology, branding
- Inclusive and transformational, incorporates positive legacy and informal activity
- An approach that has the characteristics of the plant – adaptive, resilient to change, hardy, contextual, nurturing, feminine
- Supports competitiveness and environmental sustainability of high growth industries
- Lifestyle, recreation, tourism

6.2 *Potential outcomes*

The Cannabis and hemp value chains have the potential to contribute to the following positive outcomes for the Western Cape (subject to opening up of the regulatory space, and addressing value chain integration issues).

- Employment and livelihoods
- Competitiveness and sustainability of other growth sectors
- Economic growth, inclusion and transformation
- Enterprise & agri-preneur development/growth
- Growth in agro-processing and knowledge-intensive exports
- Food security and affordability
- Improved health outcomes
- Social cohesion and harmony
- More sustainable housing and reduced fire risk
- Environmental remediation

The diagram below presents a summary theory of change.



7 Framework including recommendations on priority initiatives

Criteria for selection of initiatives for inclusion in the CanPlan were:

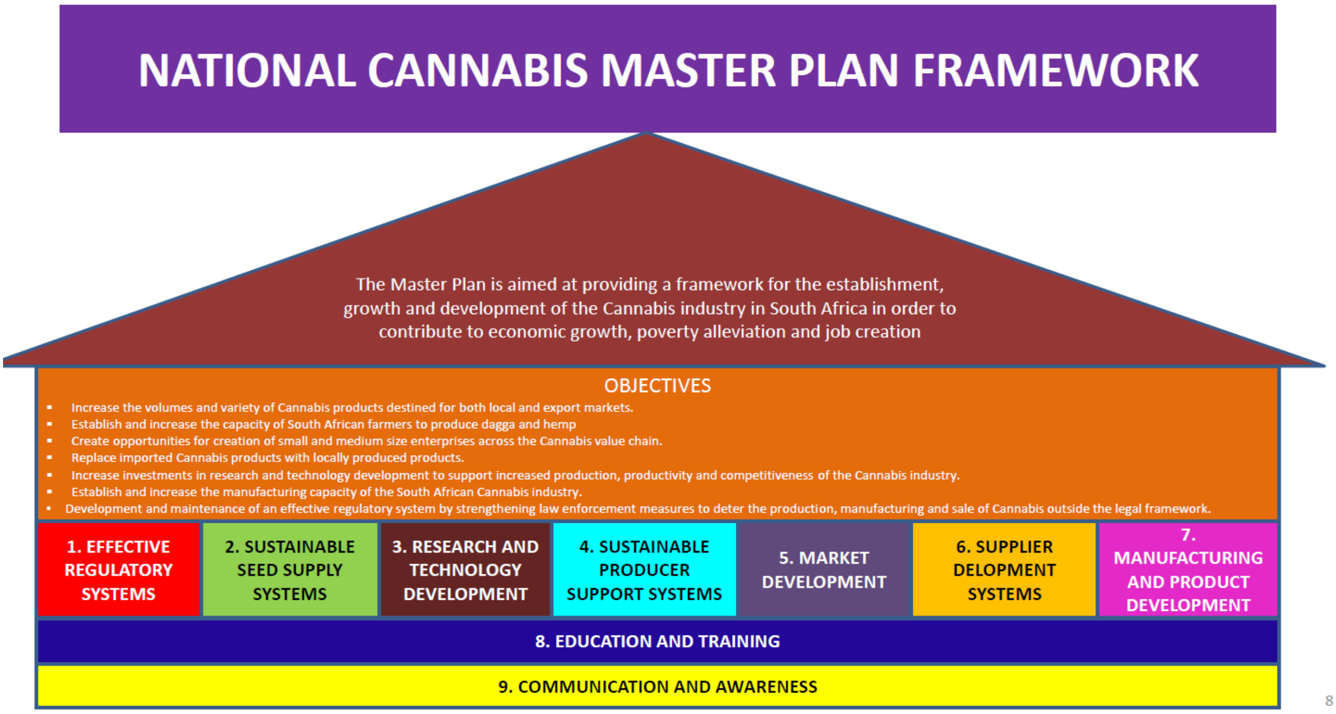
- Fit with Western Cape organisation roles and mandates (across public, private and non-profit organisations)
- Have high likelihood of positives impact on social, economic and environmental objectives (jobs and livelihoods, inclusion and transformation, climate mitigation)
- Realistic within available resources (direct or partner resources)

The recommended priority initiatives are summarised in the table below. Many initiatives link into the pillars of the current version of the national Cannabis Master Plan.

Recommended initiatives	**Potential role players/ champion**	**Short-term or medium term**
WCDOA led:		
1. Industry stakeholder coordination and problem-solving mechanisms	WC DOA strategy Hortgro, Cannabis Community Council DE&DP	Short-term
2. Information sharing and decision support (crop selection, product focus, suitable locations for growing and primary processing)	WC DOA alternative crops, GIS unit/Cape Farmer Mapper	Short-term
3. Collaborative research/ trials on suitable varieties	WC DOA alternative crops Elsenburg, ARC	Short and medium term
4. Extension and production support services for mainstreaming of legacy and informal producers and agri-processors	WC DOA extension services, Elsenburg, DEDAT SABS, private certification	Short and medium term
5. Promotion of Cannabis/hemp as rotation crop as part of improved environmental/ regenerative practices	WCDOA, Elsenburg, WC DE&DP	Short-term
6. Evaluate measures to protect and promote unique WC hemp and cannabis characteristics	WCDOA Wesgro	Medium-term

Recommended initiatives	Potential role players/ champion	Short-term or medium term
Initiatives with other lead organisations:		
7. Education and training, awareness raising with public, schools, decision-makers, medical professionals	Industry structures, THP WC, TNPA, Happy by Nature, Sustainability Institute WC Dept of Education and Social Services, local municipalities, Green Cape	Short-term
8. Western Cape brand development	DEDAT Wesgro	Short-term
9. Effective, evidence-based advocacy and red tape reduction	DEDAT red tape unit, Office of the Premier Wesgro legal	Short-term
10. Cannabis and hemp investment support and facilitation	Wesgro	Short-term
11. Networking and innovation with end-use industries in Western Cape	DEDAT, sector bodies (Blue Cape, SAPOA WC, Construction industry)	Short-term?
12. Cannabis tourism support	DEDAT Tourism Wesgro	Medium-term
13. Provincial and local public procurement market activation (health, human settlements, education etc.)	DEDAT WC Depts of Health, Human Settlement, Education Local municipalities	Medium-term
14. Assessment and activation of role of Cannabis and hemp in environmental remediation, including on depleted farmland	WC E&DP, WCDOA conservation partners, Cape Nature	Short to medium term

Reminder of current Cannabis Master Plan Pillars:



8 Appendix A: PESTOLE and risk analysis

8.1 *PESTOLE analysis*

Political:

- A Cannabis Master Plan has been developed by government, but progress on the finalization, acceptance and implementation have been stalled. The plan is viewed by various role players as incoherent and not inclusive enough. Jurisdiction over the implementation of the plan stretches across multiple government departments with a history of operating within silos
- National political and leadership instability could affect national policy
- Substance abuse is a big factor in the Western Cape, with alcohol being the biggest problem. Focus on this by the Western Cape Cabinet are considered
- Western Cape is politically stable
- Lack of clear Cannabis policies by the political parties hampers progress and collaboration within provincial and national government departments
- Divergent views on Cannabis exist – some supporting full legalization, some showing concern over substance abuse in general and others fully prohibitionist.
- South Africa is a signatory of the UN Single Convention of Narcotic Drugs and government are honouring this agreement, while many signatories are circumventing or ignoring it (e.g., Canada, Uruguay, soon Germany)
- Strong pressures exist to address unemployment and economic conditions in the country – this sets unrealistic expectations from new industries
- Tensions often exist between economic, social, cultural and environmental imperatives

Economic

- High unemployment in SA and W Cape
- Inflationary pressures both in South Africa and globally, impacting on consumer spending and disposable income, food security etc.
- Global period of economic uncertainty and disruption of supply chains etc.
- Political instability and market conditions causing instability in the Rand making it difficult to determine local pricing equivalents and affecting input costs of imported material.
- The Cannabis and Hemp industry can provide a valuable contribution the economic ills of the country
- Varying economics exist across the value chain:
    - Medicinal Cannabis is farmed intensively with high yields and industrial hemp extensively with lower yield.
    - Variable pricing for exist for carbon sequestering products like biochar. It is possible that hemp biochar will command a premium in the market.

  - The informal market (still illegal in most formats) is currently more lucrative than most aspects of the legal Cannabis industry.
  - Retail pricing of recreational Cannabis is based on local supply and demand factors, with big differences across clubs and different regions.
- Prices of all forms of Cannabis is dropping rapidly internationally and locally, with a halving happening every 3 years.
- Risks exist of global overproduction leading to a glut in Cannabis and related products that could collapse markets.
- Changing global production patterns could provide opportunities for local producers as there is a renewed focus on Africa and the global south. This could also put further downward pressure on pricing as Cannabis and hemp is grown in areas with lower production costs and favorable currencies.

Sociological

- South Africa has a long history of Cannabis cultivation and consumption for recreational, medicinal, and spiritual uses.
- The Western Cape is rich in traditional and indigenous knowledge on the healing properties, integrative healing practices, wellness, and spiritual wellbeing that full spectrum (whole plant) Cannabis can provide.
- Changing mindsets and awareness exist around the environment, wellness and health that mostly support greater use of natural products and more environmentally friendly products and services
- Social structures in the Western Cape are complex and leads to inequalities which brings pressures such as substance abuse, gangsterism and general apathy and dissatisfaction from the youth.
- Many societies in the Western Cape and country are reliant on the income provided by illegal Cannabis. These communities could be left destitute by their inability to integrate into the legal industry due to barriers of entry.

Technological

- Innovation has led to various technologies being available in the Western Cape. These include:
  - Genetic development and clonal propagation
  - Cannabis specific analytical laboratories catering for the compliance and safety needs of the industry.
  - Medicinal Cannabis production – innovative and intelligent lighting, climate control, nutrient scheduling, irrigation and holistic facility design is needed for consistent compliant production of medicinal Cannabis.
  - Decortication and fibre processing – Internationally huge strides have been made here, but no local processing is happening yet. A producer of hemp construction material in the Western Cape are in the final phases of

building a decorticator. No milling of natural fibre is happening in the country currently.
    - Technologies relating to medical devices and a variety of delivery methods, including inhalers, transdermal patches and nanotechnology increasing the bioavailability of active ingredients exist in the Western Cape.
    - Internationally developed track and trace software and IOT devices are available and being implemented locally. Little local development is taking place here and Afro-centric solutions are required.
    - Packaging and labelling technology
    - Existing technology from other industries can be adapted and applied to Cannabis and hemp. These include cell disruption, dewatering, shredding and recycling.
- Scaling, open access and the financial input required is a barrier to advances in technology in Cannabis. Development is mostly happening in silos.
- The Western Cape has an established chemical manufacturing industry that can be tapped into for research and development of hemp by-products and beneficiation of the waste stream.
- A well-developed food technology sector exists
- Agricultural equipment manufacturing and adaptation is available in most farming areas, with innovative improvements being made to existing imported machinery in many cases.

Organisational

- Numerous initiatives to organise the industry (Cannabis Community Council, Cannabis Industry Development Co-Operative Western Cape, Friends of Hemp, Cannabis Trade Association Africa, Cannabis Industry Development Association of South Africa)
- Established networks within both the informal and formal parts of the industry
- Fragmented and under-resourced industry associations
- Silos between line departments and line regulators
- Coordination gaps between provincial and national government
- Institutional capacity within the Western Cape government
- Different levels of capacity between municipalities to support an emerging/formalising industry

Legal

- Medicinal Cannabis licensing through SAHPRA since 2017
- Clear guidelines and enabling conditions for the export and import of Cannabis, supply by licensed growers into the local market and the infusion of food and beverages is still lacking.

- Constitutional court ruling in September 2018 permitted private production and consumption of Cannabis. Parliament been given 2 years to rectify the Drugs and Drug Trafficking Act but is already 2 and a half years beyond this.
- Arrests and harassment of Cannabis users and growers are continuing because all forms of Cannabis is still illegal under the Drugs and Drug Trafficking act, even after amendments to the act and scheduling have been made in December 2022.
- The legitimacy of Cannabis Private and Social Clubs are being challenged by government in the court.
- Hemp permits issued by DALRRD under the Plant Improvement Act since 2022.
- Notice prohibiting phytochemical extraction (including CBD) under hemp permit
- No guidelines exist for the commercialization of hemp derived food, medicine, cosmetics or pet products, restrictions on inclusion of CBD in food and cosmetics in terms of Foodstuffs, Cosmetics and Disinfectants Act
- Lack of national standards exist for industrial hemp products e.g., construction, marine manufacturing, and some exclusions e.g. construction insulation
- Draft Cannabis for Private Purposes Bill has gone through various alterations and is now before the parliamentary committee. Allowance made for commercialization and the inclusion of traditional and religious communities.

Environmental

- Water scarcity in the Western Cape
- Climate change which may impact on further water scarcity, changing temperatures (although may also improve suitability of temperatures for Cannabis and hemp production in the Western Cape)
- Sub-optimal growing conditions for Cannabis and hemp in the Western Cape
- Soil remediation and improvement needs that could be supported by hemp production
- Threats to biodiversity – habitat loss, alien invasives, encroachment, expansion of agriculture, overharvesting of indigenous plants, pesticides, insecticides
- Hemp and Cannabis derived natural medicine can provide an alternative to wild harvesting of plants with similar therapeutic benefits.
- Hemp can provide large amounts of biomass to be used in carbon sequestering
- Indoor cultivation of Cannabis is detrimental to the environment with huge energy needs, a large waste stream and the abundant use of sterilising agents and pesticides.
- Hemp has a soil rejuvenating effect, with farmers being able to grow years of successive crops on the same land.
- Hemp can play a big role in current crop rotation systems, especially in regenerative agriculture.

8.2 *Risk assessment for different aspects of the value chain*

	Risk level	Comments on nature of risk	Potential mitigations
Genetics	High	Time required to develop and stabilise new genetics, shifting consumer patterns, legislation changes and competition.	Focus on African genetics and the incorporation thereof into hemp and Cannabis breeding programs will explore a niche that can become mainstream.
Inputs	Medium	Technology risk, market and competition risk Oversaturation	Suppliers must stay on top of technological advances and remain competitive in pricing. Focus should be on customer service.
Primary production/ cultivation	Very high	Investment and finance risk technology risk Climate and water risks Electricity supply issues Genetics risks Biohazard risks (mould, contamination) Regulatory risk Market, pricing, timing and competition risks	Education, training and agronomic research needed to equip farmers. Existing support structures like farmers associations should be utilised. Alternative markets for rejected products should be developed. Resilience through redundancy build into water and electricity supply Remediation technology for contaminated products. Insurance
Research, product formulation	Low/ medium	Long term investment required, time frame could lead to parallel development of similar technologies. Stability testing for products is expensive and time consuming and a product could ultimately fail.	Government or institutional grants. Enabling investment into the sector.
Extraction and processing	High	Regulatory risks Market, pricing and competition risks Investment risk Technology risk Supply chain and timing/sequencing risks (all stages of processing / supply chain links secured, "chicken and egg" situation, contracting risk)	Minimise investment into new and unproven technology. Optimise investment into local development of processing technologies. A commodity body needed to coordinate planting, harvesting, processing and marketing of hemp.
Import and export	Medium	Market, pricing and competition risks Currency fluctuations	Cannabis specific insurance products are available.

	Risk level	Comments on nature of risk	Potential mitigations
		Regulatory risks Supply chain risks Compliance related rejection of products	Legal counsel, and staying informed of regulatory issues Regular testing of produce throughout the season to ensure compliance.
Labs, analysis, testing	Medium	Technology risk Regulatory risk Certification or licencing failure	Thorough equipment research Legal council Following good laboratory practice Efficient laboratory management software
Brand-building and marketing	Medium	Market, pricing and competition risks Supply chain risks Regulatory risks Social Media bans	Due diligence Legal council Adherence to labelling and packaging regulations Utilise a range of marketing platforms and methods
Retail	High	Market and consumer risk (information, knowledge/awareness) competition Regulatory risk	Due diligence and market research Market awareness Cooperation between establishments. Awareness of regulatory changes and interpretation by law enforcement agencies.
Support services	Medium	Market risk	Ability to adapt Focus on customer service Innovation and efficiency

9 Appendix B: Assessment of considerations for each opportunity

Potential opportunity area	**Considerations**
Seed propagation	• Lack of locally available certified seed • Challenges in importing seed • Western Cape, especially the Klein Karoo, has a well establish seed producer system.
Medical Cannabis for export	• High risk of investing R10 to R50m prior to confirmation of licence, EU GMP certification etc. • Most existing licence holders are struggling to compete internationally, and some were selling product at reduced prices on the local market. This has resulted in prices dropping and challenges for legacy producers. Likely to be challenges in ongoing price competitiveness e.g. with the cost of energy, security and compliance. • Regional investments such as MG Health (Lesotho) are ahead in terms of European market access • Internationally a glut in production is expected due to all the uncoordinated investments currently taking place and slow development of formal market uptake.
Medical Cannabis for domestic market (traditional healer, natural health, doctors, pharmacy and veterinary) Associated natural health and wellness products and services (whole plant)	• Wide network of traditional healers and natural health practitioners in the Western Cape (over 5,000), many with an established interest in Cannabis medicinal and wellbeing applications • Scope for substitution of Cannabis for indigenous medicinal plants that are experience pressure from over-harvesting. Indigenous knowledge around this exists. • Potential for small producers and healer practitioners to grow in areas of innovation, product formulation and market access. This would require support with training, standards and certification and compliant production facilities. • Scope for expanded services like health spas, wellness clinics, corporate retreats as well as clinics and palliative care centres offering access to therapeutic Cannabis.
Medical canna-tourism and agri-tourism, voluntourism	• Significant scope to link into health and lifestyle tourism • Agri-tourism potential with farm visits and facility tours a popular attraction. • The Western Cape is an ideal voluntourism destination, with the potential of hemp related community projects to be added to the offering.
Education, training and edutourism	• Capacity exists to expand Cannabis related training offerings through a variety of institutions • WC is a choice destination for travelling students and quality offerings in Cannabis education could attract a new market. • Scope exists to equip extension officers and introduce Cannabis training into government institutions.
Research	• Agronomic as well as medical Cannabis specific research facilities in the province are already conducting Cannabis and Hemp research. • Western Cape has a good clinical trial and genomic research base.

Potential opportunity area	Considerations
	• Scope exists to do commercial viability trials, cultivar evaluation and agricultural product testing
Brand building (African Cannabis and hemp brands)	• Strong brand building expertise and track record in the Western Cape across multiple sectors (food, beverages, tech and entertainment, retail etc), some with reach across the continent and internationally • Potential to build African Cannabis and hemp brands using this expertise
Food products (local and for the region)	• The province has a well-developed food and beverage sector with advanced locally developed processing technology at hand. • Potentially scope to expand beyond current niche health foods to products providing affordable protein and food security support locally and, in the region, • Would depend on price competitiveness vs. other locations in the region e.g. Malawi and Mozambique
Cannabis and hemp retail, distribution and logistics	• Base of Cannabis and hemp retail activity in the province to build on • Wider capability in specialist distribution logistics could be leveraged
Specialist IT, technology, packaging and labelling	• IT and technology capacity could be leveraged e.g. specialist tracking and tracing software and systems • Internet of Things and WEB3 technology already being utilised by Western Cape companies in agricultural applications. • Capacity in food, beverage and health related packaging and labelling that could be extended to Cannabis products
Hemp clothing and accessories	• Base of activity in the province to build on and increase local and regional content (not necessarily all from the Western Cape, likely to require coordination with other provinces and in the region) • Challenges that many mainstream clothing retailers do not seem to want to be involved in facilitating the supply chain from intermediate fibre to finished product, or to pay a premium for a more sustainable and local product. There is however plenty of interest from retailers to include hemp in their product ranges.
Lab analysis and testing	• Base of capability and investments in the province that can form a foundation for further expansion. • Cannabis specific laboratories are already operating, with existing laboratories adding Cannabis analytics to their services. • Investment required to be able to complete a diversity of Cannabis specific required tests.
Hemp for environmental remediation	• Soil improvement, detoxification, remediation and rotational and cover crop potential. • Caution regarding planting hemp in conservation and land stewardship areas due to invasive potential.
Hemp intermediate fibre (bast and hurd, cottonised fibre, non-wovens)	• Challenges of pricing, value volume ratio, transport cost relative to product value, and need for aggregation, could create challenges of viability of large-scale processing in the Western Cape (likely that greater production for fibre will be taking place in Eastern Cape and KZN). Potentially focus on more artisanal and farm-site production for niche applications

Potential opportunity area	**Considerations**
	• Currently challenge of securing investment in the required shared aggregation facility (some attempts at securing investment in a private facility on an offtake model from small growers but viability has not yet been demonstrated)
CBD-containing food and beverages (alcoholic and non-alcoholic)	• Wide range of products already available in the Western Cape Market, technically in a grey legal area. A mix of imported final products and products made with imported isolates are offered. • Some inputs could be localised once regulation is resolved, subject to price competitiveness with landed imports • Scope for facilities providing certified inputs into food and beverage sector.
Fodder, animal feed, pet food, animal bedding	• Hemp has potential as a highly nutritious animal feed. • Hemp fibre is well established as a preferred source of horse and pet bedding. • Various companies are already investing in the niche pet food industry.
Recreational Cannabis tourism	• Some existing recreational tourism already happening informally, with Cannabis Private Clubs around Cape Town already a popular tourist destination. • Potential to leverage and tap into the existing tourism strengths in the Western Cape – lifestyle, food, nature, adventure and wine tourism etc.
Hemp construction materials and housing	• Existing activity in the Western Cape in terms of hempcrete, hemp fibre panels and hemp-based construction systems have promise, but have been struggling with financial viability to date • Possible scope around commercial and retail buildings to decarbonise and improve sustainability e.g. retrofitting for insulation and carbon offset • Currently hemp is not a low-cost building material compared to alternatives, and therefore attractive applications within the low-cost housing market (reduced fire risk, improved insulation etc). may be constrained unless cost can be reduced, or alternative business models developed
Boatbuilding components	• Globally innovation in the space of sustainable boats, including hemp yachts • Western Cape has a well-established marine manufacturing industry, including luxury catamarans and workboats, which are likely to experience pressure around decarbonising and improving environmental sustainability

10 Appendix C: Implementation plan

Further detail on recommended WCDOA-led initiatives is provided in the table below. Detail on initiatives with other lead organisations would need to be developed in collaboration with those organisations.

Initiative	Initiation timeframe	Key role players	Further detail on actions required

1. Establish industry stakeholder coordination and problem-solving mechanisms	Short-term	WC DOA, Dept of Office of the Premier (Growth for Jobs), DE&DP, DEDAT	• Initiate quarterly forum and ongoing problem solving between provincial government and organised hemp and cannabis industry and community (including DOA, Office of the Premier E&DP, DEDAT, Health, Education, Social Development, Human Settlement, Safety and Security, Wesgro, Green Cape)
			• Forum to focus on:
			  o Multi-way information sharing
			  o Joint advocacy and problem solving to unblock barriers and red tape
			• Explore a commodity group for primary producers, particularly focusing on small growers.
			• Note: Ideally, industry should also work to strengthen representation, inclusion, and sustainability of existing structures across the value chain through a consultative industry and stakeholder process (to decide, aims and objectives, membership, constitution), possibly accompanied by a portal or app.
			• Investigate viability of linking into natural products forum where common issues and role players (E&DP, DEDAT coordinating the natural products forum)
			• Links particularly to WCDOA Programmes 1(Senior Management and Communication aspects), 3 (Agricultural Producer Support and Development)
			• Purpose/aims and objectives recommended to include:

Initiative	Initiation timeframe	Key role players	Further detail on actions required
			o Create a safe space for all parts of the industry to participate and speak openly (including informal / grey space) o Multi-way information sharing o information /coordination research capability and current research projects across industry, academic, public o Joint advocacy to unblock barriers and red tape • Complementary informal information sharing and coordination mechanisms e.g. through Hemp Hub WhatsApp Group *See stakeholder list and map for relevant organisations to draw from*
2. Information sharing and decision support	Short-term	WC DOA alternative crops DE&DP Hemp hub	• Economic analysis and modelling of different outputs, returns, with scope to vary pricing (building on spreadsheet developed as part of this project) • Integration into alternative crops and Cape Farm Mapper decision support system • Sharing of list of useful resources that are regularly updated (see also industry organisation information sharing points) • Provide key cannabis and hemp information on website – regulatory, value chain and market (ideally contracted out to ensure regular updating) • Links particularly to WCDOA Programmes /Initiatives: GIS services and Cape Farm Mapper, Alternative Crops, 1(Communication), Programme 6 (Agricultural Economic Services), Programme 7 (Agricultural Education and Training)
3. Extension, production and processing support services to mainstream legacy and informal	Short-term	WC DOA Elsenburg Private and non-profit colleges e.g. Cheeba	• Integration of hemp and Cannabis production into agricultural extension services (including training of extension officers) • Integrate into agriculture and agro-processing training • Product development and production formulation support linked to Agri Hub • Quality control training and certification and standards support (linking into SABS hemp and cannabis Technical Committee)

Initiative	Initiation timeframe	Key role players	Further detail on actions required
producers and agri-processors			• Inclusion of Cannabis and hemp into farmer support packages • Support for red tape reduction Links particularly to WCDOA Programmes /Initiatives: Programme 3: Producer Support and Development; Programme 6 (Agricultural Economic Services, in particular Agro-Processing Support), Programme 7 (Agricultural Education and Training)
4. Collaborative research/ trials on suitable varieties	Short and medium-term	WC DOA alternative crops Elsenburg, ARC	• Identify landraces / strains for further testing that meet local requirements • Collaborate with ARC in cases of publicly-owned land for trials • Identify collaborative sites for trials e.g. that already have irrigation, where informal growers are already active, licence/permit holder sites • International collaborations with varieties from similar latitudes / climate conditions e.g. with Polish researchers Links particularly to WCDOA Programmes: Programme 5: Research and Technology Development Services, alternative crops.
5. Research and promotion of Cannabis/hemp as rotation crop as part of improved environmental/ regenerative practices	Short and medium-term	WCDOA, Elsenburg, WC DE&DP AgriWC	• Research and preparation of materials on benefits of rotation cropping, soil improvement and environmental remediation, economics • Collaboration to share materials and training with agricultural associations • Links particularly to WCDOA Programmes: 1(Communication), 2 (Land Care), 3 (Agricultural Producer Support and Development), 5 (Research and Technology Development)
6. Evaluate measures to protect and promote unique	Short and medium-term	WCDOA Wesgro	Investigate and assess the options to protect and promote, and secure value for unique characteristics of W Cape cannabis and hemp (people and knowledge, place, process, landraces) and to promote consumer confidence e.g. certification mark, collective trademark, merchandise mark,

Initiative	Initiation timeframe	Key role players	Further detail on actions required
WC hemp and cannabis characteristics			Traditional Knowledge – ITK, geographical indication. Assess suitability, fit, existence of preconditions e.g. whether Agricultural Product Standards Act applies, existence of appropriate custodian that is suitably representative and well-equipped to champion and administer. Based on decision, explore best support and funding mechanism, including with international partners if appropriate. Links particularly to WCDOA Programme 6: Agricultural Economic Services (also strategy and planning)

11 Appendix D: Selected summary country case studies

The brief overviews below of the experiences of selected countries in the region, as well as Jamaica, can provide useful insights and lessons for the Western Cape. They can also provide a sense of potential competitive dynamics in the region.

11.1 *Lesotho*[8]

- One of the first countries in southern Africa to legalise the cultivation and use of medical cannabis.
- Estimated that 70% of all marijuana in South Africa is grown in Lesotho
- Conditions considered excellent – ample and high-quality water, high altitude (>2000m), clean air lower humidity to reduce mould risk, labour, regulation
    - 2021 production cost estimated at ~ USD$0.93 /gram
- Has attracted 70 to 90% of foreign investment into Cannabis value chain in Africa to date, early regulatory shift. Cultivation and processing.
- Initial licensing from 2017 with no limit and limited oversight, initially only to Basotho
    - USD$35 000 payable in arrears after a year
    - Was estimated of around 140 licenses issues, 97% were not being used
    - Within 2 years led to boom and bust, acquisition of some producers by international firms
- New government in 2020 made licencing stricter, more expensive and more in line with international certification requirements
    - License fee now USD$350 000
    - Five successful growing farms as at 2021
- Challenges of exporting via SA (export certification requirements)
- Recent pattern of consolidation and disinvestments e.g. Canopy Growth (largest cannabis company in the world by balance sheet for a long time) invested CanadianS$28m in 2018, has withdrawn to focus on home market/regional markets of Canada and US (part of a wider trend)

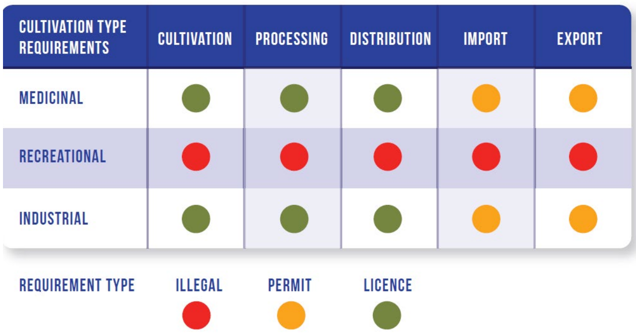
MG Health

- First EU GMP certified facility in Africa (secured in March 2021)
- Successfully exporting flos to Germany, also Australia and Israel,
    - Have a German partner that is also involved in import and distribution (Drapalin)
- Vertically integrated – internal genetics, cultivation, processing, export, single site
- 5,000 sqm greenhouse, fitted with internal climate, temperature, humidity and lighting controls, houses plants which are dried and trimmed to produce 250kg of medical-grade cannabis flower per month.
- Plans to increase this output to 100 tons p.a. using a cultivation area of 160,000 sqm
- Location chosen based on water access / drought resilience (following 2015 drought) close to Katse dam
- Use independent testing facility in Maseru (LuCan Laboratories)
- Also involved in extract production

[8] Sources: https://cannavigia.com/cannabis-country-report-lesotho-how-to-get-a-license-how-to-export-products-abroad ; https://mghealth.com/; https://www.forbesafrica.com/life/2022/04/05/breaking-new-ground-the-medical-cannabis-sector-in-lesotho/ ; https://cannavigia.com/cannabis-country-report-lesotho-how-to-get-a-license-how-to-export-products-abroad

11.2 *Malawi*[9]

- Established longstanding positive reputation in international markets of "Malawi Gold" strain
- **Estimated in 1990s that 385,000 acres were under production**
- February **2020 Cannabis Act legalising the cultivation and processing of low THC industrial hemp**.
    - Industrial hemp defined as including extracts from low THC flower
- Medicinal cannabis later added, **THC level not prescribed**
- Industrial Crops Association is supporting information sharing and organisation
- **Cannabis Regulatory Authority** has been established
- Licensing process includes demonstration of market offtake



Source: https://sacgow.com/wp-content/uploads/2022/01/An-Investors-Guide-to-Cannabis-in-Malawi.pdf

- Invegrow was the first company to secure a license to trial in 2015, after research and lobbying since 2013
    - **ISO22000 factory and laboratory**
    - Producing flower, seed, cosmetics, food, cosmetics, multi-input biomass briquettes, hurd and fibre (in-house consumption)

[9] Sources: https://allafrica.com/stories/202110200412.html
https://www.ica-malawi.org/resources ; https://www.invegrow.com/ ; https://sacgow.com/wp-content/uploads/2022/01/An-Investors-Guide-to-Cannabis-in-Malawi.pdf
https://www.econstor.eu/bitstream/10419/229247/1/wp2020-023.pdf

11.3 *Zimbabwe*[10]

- Farming cannabis for medical use in Zimbabwe was **legalised in 2019**
    - 57 licences were issued
- Zimbabwean tobacco growers have experienced a decline in their market, and are trying to diversity into industrial hemp, **aiming for a quarter of their income comes from cannabis or hemp by 2025**
    - **145,000 tobacco growers registered** with the Zimbabwe Tobacco Board, already have systems in place for contract production, processing, and distribution
    - Tobacco Research Board (TRB) is evolving its mandate to include alternative crops, and doing research on varieties more suited to Zimbabwe conditions
- Industrial hemp legislation has been amended in 2023 to **remove industrial hemp from the country's list of dangerous drugs, level set changed from 0.3% to 1.0% THC**
- **First industrial hemp exports to Europe in 2022**, 30 tonnes to Switzerland
- Farmers face a number of challenges:
    - Regulatory burden
    - Setup costs – requirements for greenhouse production for medicinal cannabis exports

[10] Sources: https://iafrica.com/zimbabwes-tobacco-industry-looks-to-cannabis-as-a-major-revenue-source/; https://hemptoday.net/zimbabwe-strikes-hemp-from-drugs-list-sets-thc-limit-at-1-0/#:~:text=The%20Zimbabwean%20government%20initially%20planned,received%20cultivation%20and%20processing%20licenses. ; https://internationalcbc.com/zimbabwe-tobacco-farmers-get-more-incentive-to-switch-to-hemp/ ; https://www.newsday.co.zw/agriculture/article/200007075/zim-sets-cannabis-thc-limit-at-1

11.4 *Jamaica*[11]

- Before 2015, it was illegal to use or possess marijuana in Jamaica, despite long history of production (known locally as ganja or herb), and cultural and religious use
- 2015 - Amendment to Dangerous Drugs Act, decriminalized the possession of cannabis for personal use (small volumes) and enabled Rastafarian use for religious purposes
- **Cannabis Licensing Authority (CLA)** can license Jamaican companies for medicinal, scientific, or research purposes, agency falls under the Ministry of Industry, Commerce, Agriculture, and Fisheries
    - As at September 2022, 106 licences issued, 30 applications at the licence granted stage; 333 applications at the conditional approval stage.
    - **Various guidelines and policies developed in addition to licensing e.g. *Policy on Educational Ganja Tours***
- Licenced herb houses are permitted to sell ganja for medical and therapeutic purposes, include online sale provisions initiated during Covid
- 2020 started **pilot efforts** to bring illicit growers into the legal industry through the ***Alternative Development Programme*** and started consultations with key stakeholders on the **Cultivator's (transitional) Special Permit Policy**
    - Also **provision in the law for expungement of previous of cannabis related offences subject to a fine**
- Various industry associations exist e.g. Jamaica Licensed Cannabis Association; Ganja Growers and Producers Association of Jamaica (GGPAJ), and have been **advocating for more effective and inclusive regulation, and that alternative development efforts are inadequate**
- Unofficial ganja tourism has existed for many years (but technically prohibited) now Jamaica has started **formally promoting medical and wellbeing cannatourism**
    - Herb houses/ dispensaries in tourism locations
    - Farm visits
    - Permitted to use an international script

[11] Sources: https://www.benzinga.com/markets/cannabis/22/09/28762506/2f4b-weed-in-jamaica-cannabis-legal-status-guide ; https://www.healtheuropa.com/jamaica-helps-illegal-cultivators-into-legal-cannabis-industry/97033/; https://www.cla.org.jm/ https://www.jamaicaobserver.com/news/expert-says-new-laws-stifling-legal-ganja-industry/ ; https://www.pressreader.com/jamaica/daily-observer-jamaica/20210708/281535113985380 ; https://jamaicatourbase.com/travel-tips/guide-to-cannabis-and-canna-tourism; https://www.lonelyplanet.com/articles/smoking-weed-legally-jamaica

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