

Business and Policy Perspectives

COP27: Coal Post Mine Futures

November 7, 2022



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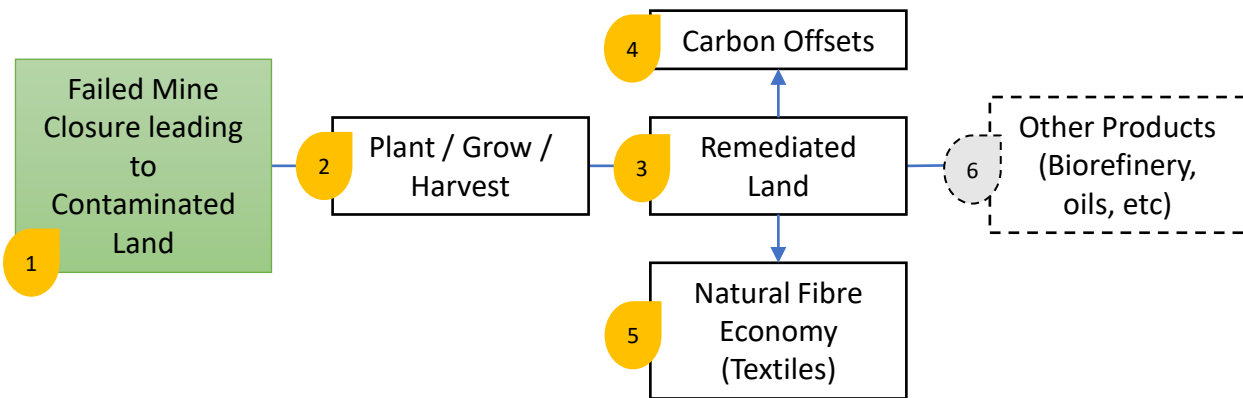


- **The Status Quo**
- **A bit about Cannabis**
- **Textile Decarbonisation**
- **Carbon Credits**
- **Challenges**



The Current Status Quo is Unsustainable...

The South African mining sector can benefit from new agricultural practices centred around hemp cultivation. Growing hemp offers an avenue to address the informal mining sector participate in the Just Transition and facilitate a low carbon economy.

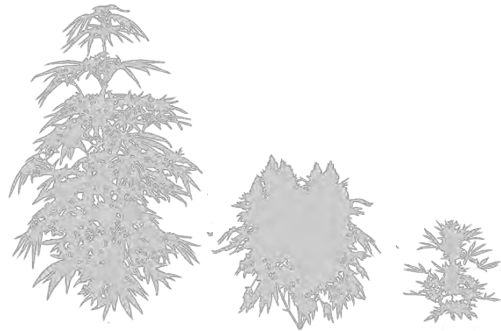


A great deal of research has already been established across various points in the value-chain. **We would like to harness this knowledge using hemp as a conduit for economic change.** Applying an integrated solution, based on evidence, directed towards commercialisation and community inclusion.

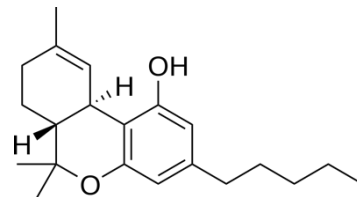


Demystifying Cannabis

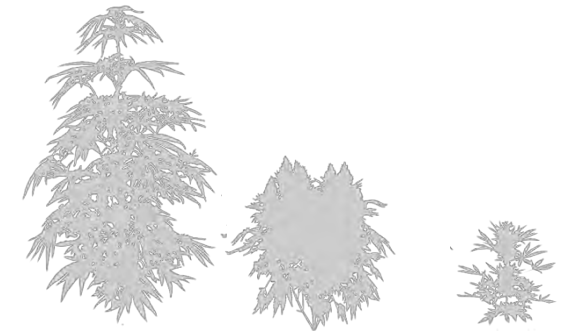
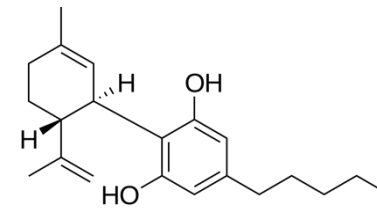
Cannabis sativa comes from the Cannabaceae family and is prized for its wide industrial application and +100 chemical compounds, called cannabinoids (e.g. THC and CBD), for which there are natural receptors in human, animal, and plant anatomy. Cannabis is an agricultural commodity.



THC



CBD



“ D A G G A ”

Concentrations of THC **ABOVE 0.3%**

Can have both THC and CBD

Often optimized for THC content (15%+)

**M E D I C I N A L & A D U L T
U S E**

Personal & Commercial



- 140 different cannabinoid compounds
- Terpenes, lipids, flavonoids also present
- 2 most *common*: THC & CBD
- 2 most *isolated*: THC & CBD
- Regulations & definitions follow these two compounds



“ H E M P ”

Concentrations of THC **BELOW 0.3%**

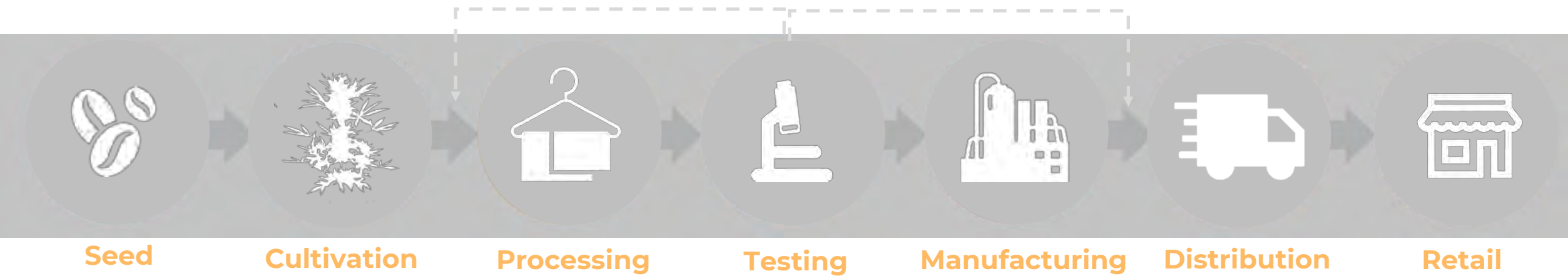
Almost none to zero THC

Optimized for CBD content (10-15%+)

WIDELY AVAILABLE GLOBALLY

Present in FDA approved medicines

Cannabis Value Chain



Towards Resilient Futures

Can fibre-rich plants serve the joint role of remediation of degraded mine land and fuelling of a multi-product value chain?



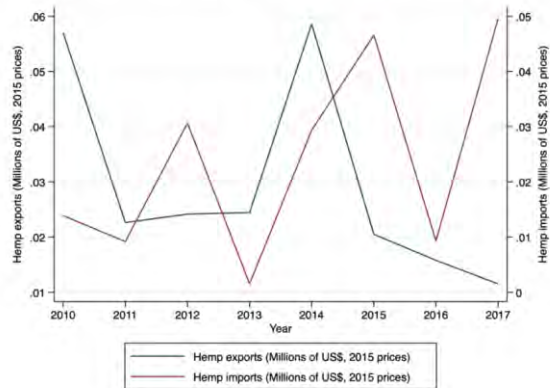
We place a focus on Hemp’s industrial capacity as a fibrous crop, lending itself to various types of Textile manufacturing

Natural Fibre Economy (Textiles)

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Hemp would typically be processed into non-woven/woven textiles. However, using the same process and different parts of the plant, hemp Hurds can be used to make carbon neutral hempcrete. This is particularly relevant as South Africa has implemented several building regulations and codes on energy efficiency and usage in buildings for new buildings and major refurbishments of old buildings (Sustainable Energy Africa, 2017).

Figure 3: Exports and imports of hemp by South Africa in 2015 USD (2010 - 2017)



One of the contradictions of the South African textiles sector is the low use of locally produced natural fibres, with some fibres, such as BCI cotton, being imported from Zimbabwe (for instance). This is contradictory to South Africa having a reputation for producing world leading cotton lint and mohair (50% of global production) (Better Cotton, 2022; Cotton SA, 2017; Louw, n.d.; Mohair South Africa, n.d.). **However, most of this is exported, and is very likely to find its way back into South Africa as imported fabric or clothing** (Cotton SA, 2017; Key informant interviews, 2022).



The South African retail sector may be the key to leveraging a shift in the use of locally produced fibres, especially given its commitment through the launch in 2019 of the South African R-CTFL Master Plan, which includes ambitions to reignite local production and manufacturing to 65% of total retail sales by 2030 (an additional 85 million units of clothing, leather goods and footwear) (the dtic, 2020a). **The intention is to thereby stimulate an increase in employment to almost 320 000** (Crotty, 2022; the dtic, 2020a; PMG, 2020; Research and Markets, 2021b).

Carbon Credits and Climate Change

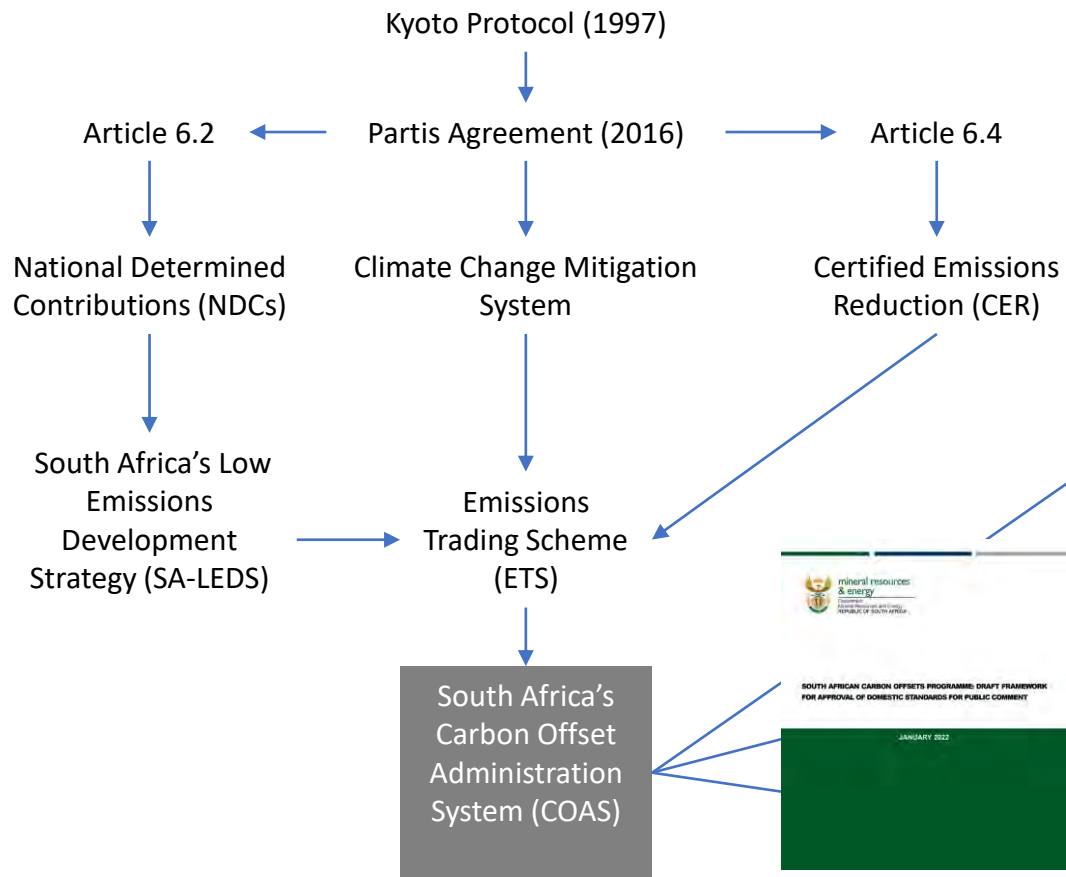


FIGURE 1: THE ROLE OF THE COAS SYSTEM²

“... ensure that local carbon offsets projects generate sustainable development benefits and employment opportunities in South Africa by mobilising investments in energy efficiency and renewable energy, rural development projects, and initiatives aimed at restoring landscapes, reducing land degradation and biodiversity protection.”

A domestic standard will help create jobs, develop capacity within local institutions, reduce reliance on international standards, cater for small-scale and micro community projects and unlock mitigation potential in the AFOLU sector, which are not well covered by international standards, starting in 2023.

“Scope is also given for domestic South African standards/ methodologies approved by the Minister responsible for Energy or delegated authority to be utilised in subsequent phases of the carbon tax.”





Key Challenges



Article

Understanding the Opportunities, Barriers, and Enablers for the Commercialization and Transfer of Technologies for Mine Waste Valorization: A Case Study of Coal Processing Wastes in South Africa

Helene-Marie Stander ^{1,2,*}  and Jennifer L. Broadhurst ¹ 

Results indicated that financial considerations and demonstration of technical feasibility will be vital in determining the success of technology transfer, as will a changing perception of waste and its value within the sector. Original equipment manufacturers (OEMs) and boutique waste processors were identified as potential commercial partners for further development and commercial implementation of university-developed waste valorization technologies within the mining sector

Key Challenges

JOURNAL OF PLANT NUTRITION
<https://doi.org/10.1080/01904167.2021.1881553>



Check for updates

Nitrogen fertilizer ameliorate the remedial capacity of industrial hemp (*Cannabis sativa* L.) grown in lead contaminated soil

Gang Deng^{a*}, Mei Yang^{a*}, Muhammad Hamzah Saleem^b, Muzammal Rehman^{a,b}, Shah Fahad^c, Yang Yang^a, Mohamed Soliman Elshikh^d, Jawaher Alkahtani^d, Sardar Ali^e, and Shah Masaud Khan^f

Industrial Crops & Products 161 (2021) 113220



Accumulation and sub cellular distribution of lead (Pb) in industrial hemp grown in Pb contaminated soil

Yanping Xu^{a,b}, Gang Deng^c, Hongyan Guo^b, Ming Yang^b, Qinghui Yang^{a,*}

Article

Morpho-Physiological and Metal Accumulation Responses of Hemp Plants (*Cannabis Sativa* L.) Grown on Soil from an Agro-Industrial Contaminated Area

Fabrizio Pietrini^b, Laura Passatore, Valerio Patti, Fedra Francocci, Alessandro Giovannozzi and Massimo Zacchini^{*@}

Research Article

Phytoremediation Potential of Hemp (*Cannabis sativa* L.): Identification and Characterization of Heavy Metals Responsive Genes

Chemosphere 229 (2019) 22–31



Novel remediation of per- and polyfluoroalkyl substances (PFASs) from contaminated groundwater using *Cannabis Sativa* L. (hemp) protein powder

Brett D. Turner^a, Scott W. Sloan, Glenn R. Currell

Centre of Excellence for Geotechnical Science and Engineering, Civil Surveying and Environmental Engineering, The University of Newcastle, University Drive, Callaghan, N.S.W., 2308, Australia

Environmental Chemistry Letters (2019) 17:393–408
<https://doi.org/10.1007/s10311-018-0812-x>

REVIEW

Hemp-based adsorbents for sequestration of metals: a review

Nadia Morin-Crini¹ · Sonia Loiacono¹ · Vincent Placet² · Giangiacomo Torri³ · Corina Bradu⁴ · Mirjana Kostic⁵ · Cesare Cosentino³ · Gilles Chanet⁶ · Bernard Martel⁷ · Eric Lichtfouse⁸ · Grégorio Crini¹

Heavy metal tolerance and accumulation of Cd, Cr and Ni by *Cannabis sativa* L.

Sandra Citterio^{1,3}, Angela Santagostino¹, Pietro Fumagalli¹, Nadia Prato¹, Paolo Ranalli² & Sergio Sgorbati¹

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Thank you



THANK YOU



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