



POLICY BRIEF

No. 110

JUNE 2023

KEY POINTS

- Industrial hemp has been used for millennia, but its versatility and its multiple agronomic and environmental properties were only reconsidered and, in many instances, rediscovered, about 30 years ago
- All parts of an industrial hemp plant can be used, and its exploitation could generate important economic and social benefits
- Industrial hemp can help mitigate the effects of climate change, as it captures significant amounts of carbon dioxide by storing carbon in both stems and roots during photosynthesis
- Due to the botanical characteristics of industrial hemp, a whole-plant approach, based on the exploitation and valorization of all parts of the plant, with possibly zero waste generated, can be achieved in most parts of the world; however, in most countries, the implementation of a whole-plant approach will require some legislative reform

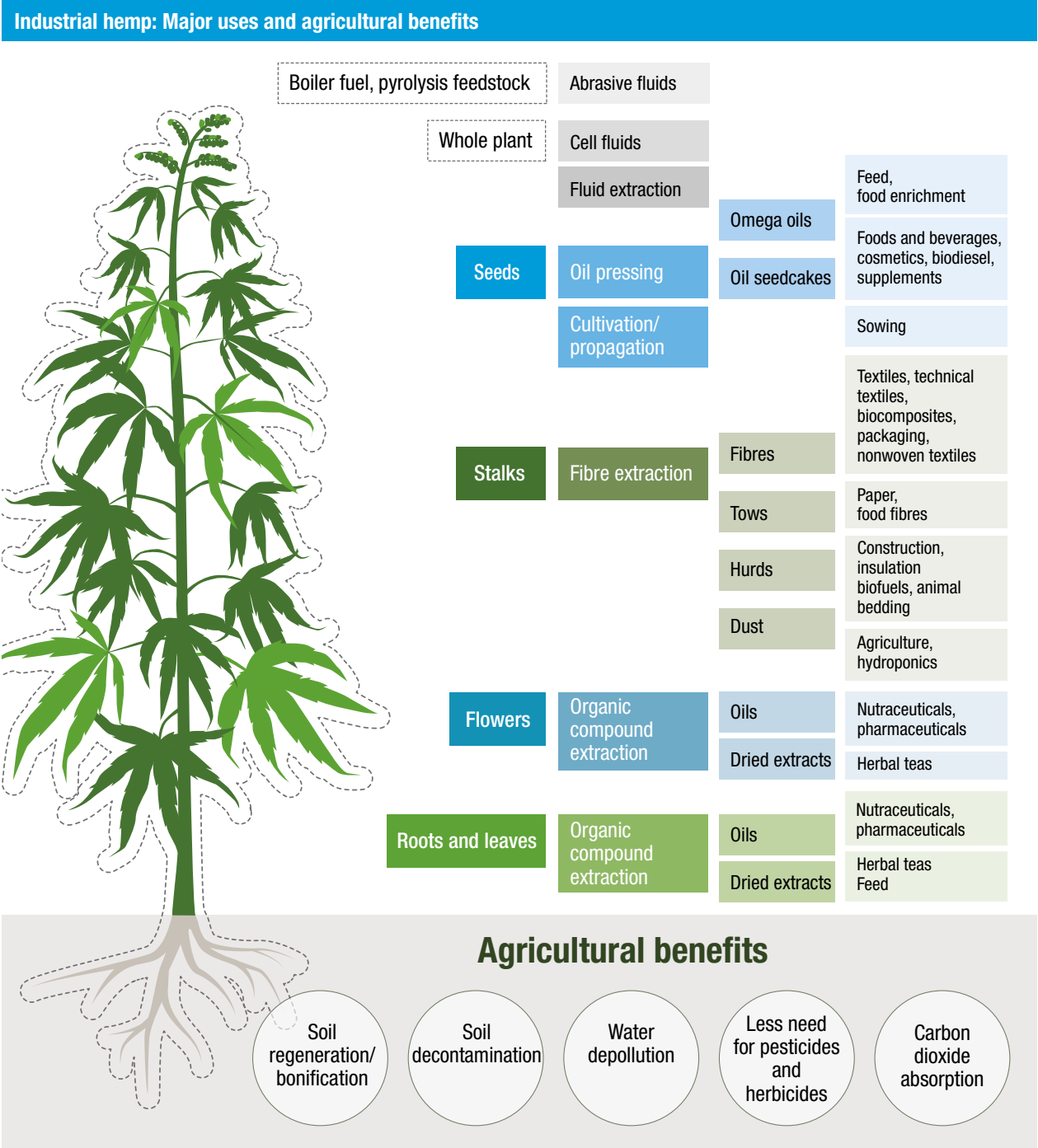
Industrial hemp: An old crop in a modern era

Climate change and its impacts on the daily lives of billions of people require innovative actions. One potential component of such initiatives could be to advocate for and foster an industrial hemp sector, for exploitation and valorization based on a “whole plant” approach that uses all parts of the plant. Such exploitation could be achieved in most regions of the world, and the whole plant approach would help promote the establishment of various production chains. As discussed in this policy brief, industrial hemp value chains have the potential to be carbon negative and ecologically sustainable and can therefore effectively supplement strategies for sustainable development and the transition to clean energy. Practical experiences worldwide highlight the need for Governments to establish a regulatory and institutional framework supporting the exploitation of all parts of the industrial hemp plant. In this regard, the categorization of industrial hemp as an agricultural commodity subject to regulatory oversight by an agricultural department, as in many member countries of the European Union, rather than a controlled substance, as in Malawi and the United Kingdom of Great Britain and Northern Ireland, is of paramount importance.¹

¹ For further information on and analysis of the topics discussed in this policy brief, see UNCTAD, 2022, *Commodities at a Glance: Special Issue on Industrial Hemp* (United Nations publication, Geneva), available at <https://unctad.org/publication/commodities-glance-special-issue-industrial-hemp>.

Introduction

Industrial hemp is a versatile, multipurpose crop usable in a wide array of biodiversity-based products that are of interest in various submarkets, such as agriculture, automotives, bioenergy, construction materials, food and beverages, furniture, paper, personal care, recycling and textiles (see figure).² The farming of industrial hemp is increasing. According to recent estimates, the global hemp market, by value, is projected to grow fourfold by 2030, to about \$17 billion.³ Industrial hemp offers possibilities in a myriad of areas, ranging from food security, sustainable housing and urban development to sustainable textile alternatives and carbon storage.



Source: UNCTAD, based on information available at <https://cordis.europa.eu/project/id/311849/reporting> and <https://fas.org/sgp/crs/misc/RL32725.pdf>.

² See <https://eiha.org/hemp-a-real-green-deal/>.

³ See <https://www.grandviewresearch.com/industry-analysis/industrial-hemp-market>.

However, the use of industrial hemp remains controversial as, although industrial hemp and cannabis are classified in the same genus and species, *Cannabis sativa* L., industrial hemp is often mistakenly associated with cannabis grown for its high content of the psychotropic compound tetrahydrocannabinol, while industrial hemp varieties have concentrations of tetrahydrocannabinol below legally authorized levels.⁴ Industrial hemp may be defined as a *Cannabis sativa* L. plant, or any part of the plant, “in which the concentration of tetrahydrocannabinol in the flowers and leaves of the inflorescence is not more than the regulated maximum level as established by authorities having jurisdiction”.⁵ This definition, if adopted, would be consistent with the three main international drug control conventions, namely, Single Convention on Narcotic Drugs, 1961, as amended by the 1972 Protocol; Convention on Psychotropic Substances, 1971; and United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances, 1988. In the Single Convention on Narcotic Drugs, 1961, a distinction is made between cannabis grown for the production of drugs, therefore falling within the scope of the convention, and that grown for industrial or horticultural purposes and therefore not falling within the scope of the convention.⁶ There is a need to resolve concerns with regard to industrial hemp and its characteristics in order to unlock its economic and environmental potential.

Potentials and challenges

Industrial hemp has agronomic properties that can generate considerable environmental benefits.⁷ Due to the regenerative properties of the plant, the cultivation of industrial hemp can boost other crop yields when it is included in crop rotation.⁸ Industrial hemp can be used in ecological reconstruction and land reclamation due to its ability to remove heavy metals from the ground.⁹ In addition, industrial hemp can help mitigate the effects of climate change, as it captures significant amounts of carbon dioxide by storing it in both stems and roots during photosynthesis. Industrial hemp may capture more carbon dioxide per hectare than other commercial crops or some forests.¹⁰ This implies that its cultivation can be further monetized by integrating it into carbon offset schemes or as part of nationally determined contributions to reducing greenhouse gas emissions. Finally, industrial hemp can contribute to food security. Hempseeds are rich in essential fatty acids (omega 3 and omega 6), proteins, carbohydrates (particularly insoluble fibres), vitamins and minerals.¹¹

Given such potential, several countries have undertaken regulatory reforms to promote the industrial hemp sector, such as Australia and New Zealand. Regulatory reforms have also been enacted in Africa, for example in Malawi, Uganda and South Africa; Asia, for example in Thailand; and Central and South America, for example in Colombia, Ecuador, Paraguay and Uruguay.

A regulatory framework allowing for the exploitation of all parts of the plant would facilitate the implementation of industrial strategies in order to optimize product diversification and increase the resilience of farmers and processors. Such strategies could adopt a whole-plant approach. The valorization of all parts of a plant enables the creation of production chains able to provide growth in rural areas, in manufacturing and in the food processing industry.¹² Diversity in final uses also implies flexibility in setting up a sectoral policy framework. An appropriate strategy would first consider the development of production processes that are easily transferable in order to, for example, reduce the risk of low returns due to oversupply. The development and production of hemp-based concrete and insulation materials may be the most viable areas of focus in countries with an emerging industrial hemp sector. In addition, such products could be integrated into sustainable urban development plans.¹³

⁴ See Small E, 2016, *Cannabis: A Complete Guide*, CRC Press, Boca Raton, United States of America; and <https://www.who.int/publications/m/item/ecdd-41-cannabis-recommendations>.

Note: The maximum authorized amount of tetrahydrocannabinol in plant tops varies across countries, from 0.2 per cent (for example in South Africa and the United States) and 1 per cent (for example in Mexico, Switzerland, Uruguay and Zimbabwe) of dry weight of the reproductive part of the female plant at flowering. The 1 per cent level is usually adopted, to allow for some flexibility, as content can be affected by prevailing environmental and climatic conditions even if planted varieties are those with low levels of tetrahydrocannabinol.

⁵ See <https://fiho.org/wp-content/uploads/2023/05/2023-04-25-Position-on-terminology-News-Release.pdf>.

⁶ United Nations, 1973, *Commentary on the Single Convention of Narcotic Drugs*, 1961 (United Nations publication, Sales No. E.73.XI.I, New York).

⁷ See Ahmed ATMF, Islam MZ, Mahmud MS, Sarker ME and Islam MR, 2022, Hemp as a potential raw material toward a sustainable world: A review, *Helyon*, 8(1).

⁸ Gorch G, Lloveras J, Serrano L and Cela S, 2017, Hemp yields and its rotation effects on wheat under rainfed Mediterranean conditions, *Agronomy Journal*, 109(4):1551–1560.

⁹ Wu Y, Trejo HX, Chen G and Li S, 2021, Phytoremediation of contaminants of emerging concern from soil with industrial hemp (*Cannabis sativa* L.): A review, *Environment, Development and Sustainability: A Multidisciplinary Approach to the Theory and Practice of Sustainable Development*, 23(10):14405–14435.

¹⁰ Pervaiz M and Sain MM, 2003, Carbon storage potential in natural fibre composites, *Resources, Conservation and Recycling*, 39(4):325–340.

¹¹ Farinon B, Molinari R, Costantini L and Merendino N, 2020, The seed of industrial hemp (*Cannabis sativa* L.): Nutritional quality and potential functionality for human health and nutrition, *Nutrients*, 12(7).

¹² With regard to food and food products in the European Union context, see <https://eiha.org/eiha-novel-food-consortium/>.

¹³ See Allin S, 2021, *Hemp Buildings: 50 International Case Studies*, Seedpress, Kenmare, Ireland; and <https://www.greenbuildingafrica.co.za/worlds-tallest-building-constructed-using-hempcrete-blocks-goes-up-in-cape-town/>.



Production and trade

Worldwide, of the total area dedicated to the cultivation of primary crops, the area dedicated to industrial hemp is 0.01–0.02 per cent, compared with, for example, 2.5 per cent for cotton cultivation. According to data in the statistics database of the Food and Agriculture Organization of the United Nations, about 40 countries have some level of production of industrial hemp. Historically, industrial hemp production and international trade were dominated by China and countries in Europe, such as France and the Kingdom of the Netherlands. However, Canada and the United States are becoming large producers, with increasing influence on international markets. Due to the narrow set of industrial hemp products included in international trade statistics, recorded trade flows do not fully reflect the true size of the global industrial hemp market; trade as reported in international data sets amounts to less than \$50 million per year, yet information from national and regional tariff schemes with broader product coverage suggests that a more representative figure would be at least 6–7 times higher.

Enabling policies

Countries wishing to promote an industrial hemp sector need to consider the reform of existing regulations, to facilitate the exploitation of all parts of the plant. The removal of legislative barriers to industrial hemp cultivation may increase production by farmers. For example, the common practice of having entities related to the control of narcotic drugs issue licences for growing industrial hemp should be reconsidered. A larger scale of production is necessary to reduce the long-term average production costs faced by farmers, as even primary processing operations, such as decortication or seed drying and cleaning, require machinery, the cost of which remains prohibitive for small-scale producers.¹⁴

Other policy initiatives can contribute to decreasing costs by creating external economies of scale. One example in this regard is facilitated access to funding, such as through direct subsidization or State guarantees to obtain private loans. Another example is the provision of assistance to farmers in identifying appropriate cultivation strategies, to enter a particular production chain. The creation of producers' cooperatives can also benefit the industry as a whole, as cooperatives are often associated with knowledge-sharing and stronger influence. Both features could help establish an institutional framework oriented towards a more equitable distribution of value addition along production chains.¹⁵

In general, trade flows of industrial hemp products face relatively low tariffs compared with those on other agricultural products. However, non-tariff measures are systematically imposed on imports and may also be imposed on exports, and some measures, such as those related to the concentration of cannabinoids, can have significant restrictive impacts on trade flows. The definition and adoption of quality standards can help ease access to international markets for producers in developing countries while also promoting the production of quality products, including for domestic markets. Further, the issuance of labels with regard to appellation of origin and geographical indicators could help promote the use of endemic industrial hemp varieties, especially those in developing countries, and align with sustainable rural development and environmental policies.¹⁶

At the international level, there is a clear need to improve information availability and accessibility. Public data on industrial hemp production are limited to standard products (that is, fibres and seeds) and country coverage remains incomplete. Product coverage in international trade statistics is narrow; only raw industrial hemp, industrial hemp fibres and yarn are included in international product classifications. Country-specific classifications can be used to define additional categories. The most inclusive products schedule implemented to date has been that of Canada; it may serve as a useful benchmark for the further development of international classifications.

¹⁴ For a discussion in the United Kingdom context, see <https://www.appgcbd.org/news/appg-plan-for-a-legal-and-regulated-uk-cannabis-sector-download-now>.

¹⁵ Carmody K, 2023, Hemp cultivation and processing potentials and challenges, presented at workshop on hemp in the Common Agricultural Policy reform, 28 February, available at <https://research4committees.blog/2023/03/01/digest-workshop-hemp-in-the-cap-reform/>.

¹⁶ Riboulet-Zemouli K, 2021, *Sustainable Cannabis Policy Toolkit*, Faaat Editions, Paris.

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