A Brief overview of the Hemp vs Marijuana industry

June 2021

Source document : June 2021

The industrial hemp plant and its uses

Industrial hemp was first domestically cultivated in Mesopotamia in 8000 BCE. China began cultivation in around 4000 BCE and, from about 1000 BCE to the 19th century, **it was the world's largest agricultural crop.** From the 16th to the 19th century, industrial hemp was universally used for ship sails and rope and was seen as crucial in supporting the global expansion of shipping, trade, colonization, and military activity during the period (Young 2005). By the 20th century, the development of steam-powered and petroleum-fuelled engines eroded the largest source of demand for industrial hemp (shipping) and the development of the cotton gin made cotton more commercially viable than industrial hemp as a fabric for clothing. Industrial hemp cultivation therefore began to decline.

In the inter- and post-war years, the outlawing of narcotic marijuana gained momentum internationally. Unfortunately, industrial hemp is the strait-laced, non-narcotic cousin of marijuana, but because the two plants look similar, industrial hemp was tarnished by association. This erroneous conflation of industrial hemp and marijuana led to the prohibition of industrial hemp cultivation in most countries from the 1950s onwards. Industrial hemp essentially disappeared globally as an agricultural crop in the second half of the 20th century. This disappearance has implications for the current commercial opportunities for the plant and its downstream products, as no research and development or technology development related to the crop or its processing has taken place in seven decades.

Industrial hemp and marijuana are genetically and chemically distinct forms of the Cannabis sativa plant. The plants are covered in tiny hairs called trichomes, which secrete a resin containing chemical compounds known as cannabinoids. Trichomes are found in the greatest density in the female flowers of the plants, followed by the leaves, stalks, and roots.

There are two kinds of cannabinoids found uniquely in the Cannabis sativa plant. Tetrahydrocannabinol (THC) is a psychoactive chemical and responsible for the narcotic 'high' experienced when consuming marijuana. CBD is a non-psychoactive cannabinoid, has no narcotic properties, and cannot produce any form of 'drug high'. The key differentiator between industrial hemp and marijuana (legally and chemically) is that industrial hemp has very low levels of THC. In countries that allow hemp cultivation, it is generally accepted that plants with less than 0.3 per cent THC do not have narcotic properties and can therefore be grown commercially. More specifically, in terms of legislation, Canada, the United States of America, South Africa, and most non-European Union (EU) countries in Europe define industrial hemp as any cultivar of Cannabis Sativa with a THC level below 0.3 per cent. In the EU, industrial hemp must have a THC level no higher than 0.2 per cent.

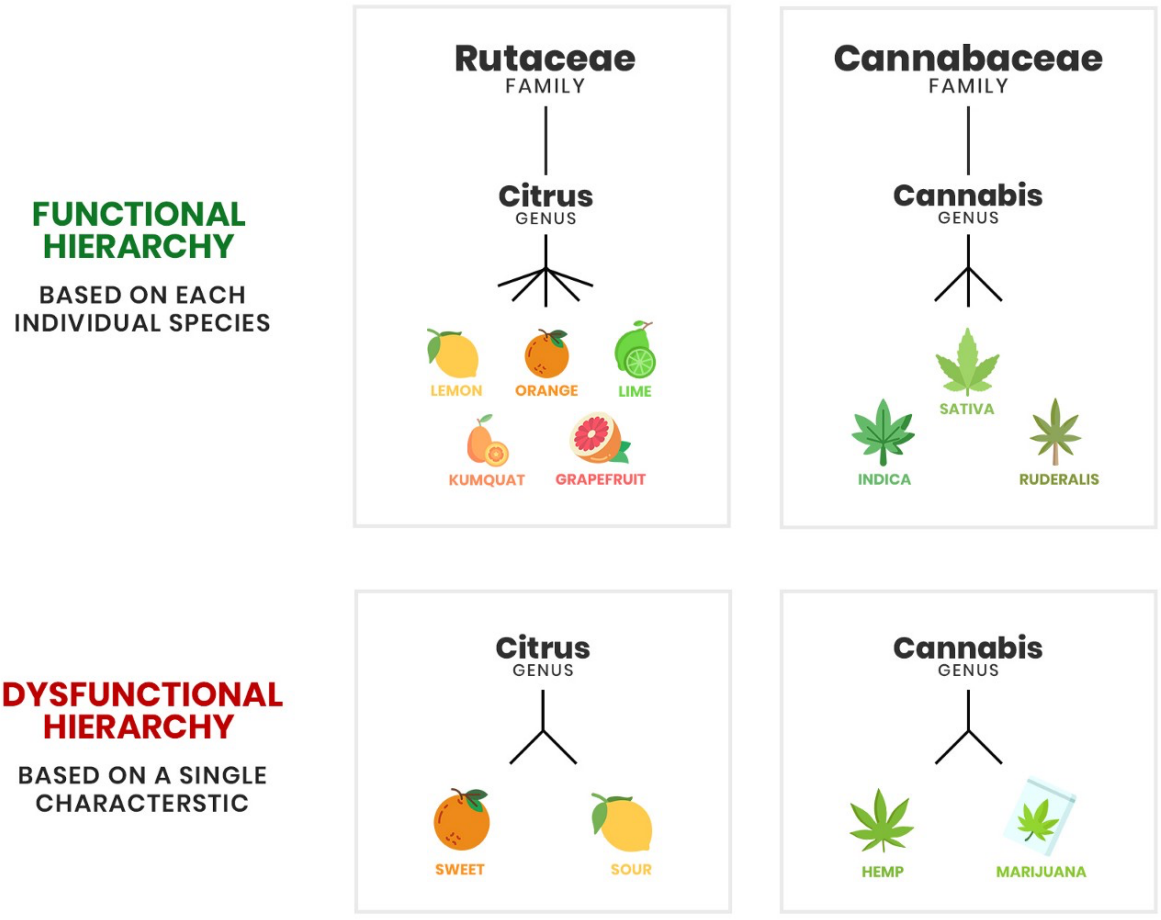
Section 10 concludes and finds that, although there is uncertainty as to the potential of the industrial hemp market, there is sufficient existing niche market demand to support the further investigation of industrial hemp as a regional value chain between Malawi and South Africa.

Demand drivers of the current increased interest in the crop. It identifies **three key drivers**: faith in industrial hemp as 'the **farmer's best friend'** in that the crop is **relatively low-input and low-management with multiple soil-enhancing capabilities; belief in industrial hemp as 'the environmentalist's best friend', both as a crop per se and for its use as a feedstock for the production of green alternatives to traditional products; and finally, demand for industrial hemp as a 'super food', as a source of therapeutic**

compounds that can be used as health supplements and inputs to cosmetics and personal care products, and CBD1 oil.

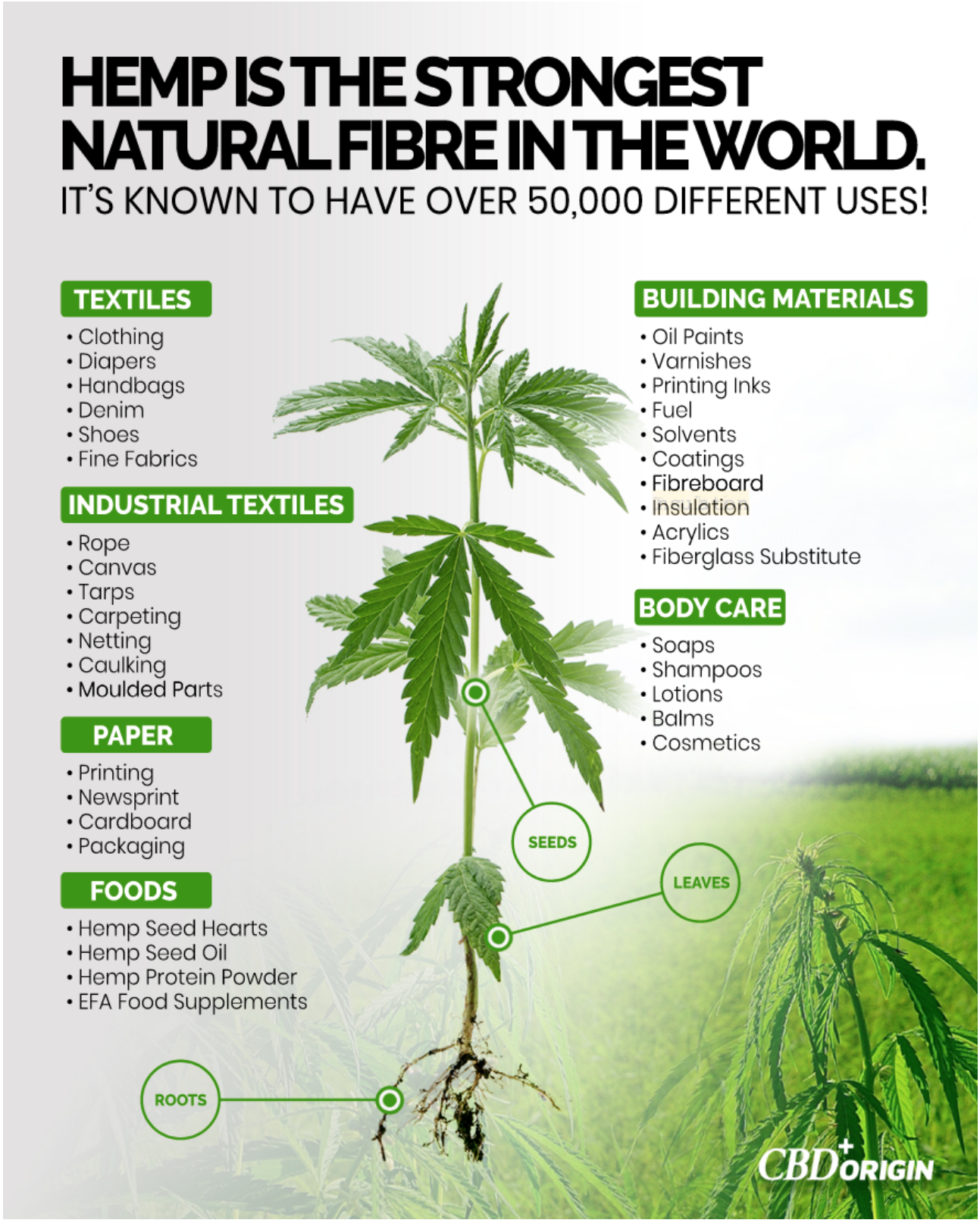
The industrial hemp plant is a fast-growing, annual herbaceous plant with a deep tap root. It can grow up to 5 m high, depending on the cultivar and growing conditions. The plant has a slender main stem and, when grown at commercial densities, the stems are almost unbranched. The stem comprises two parts: the bark or bast, which contains the long fibres used in textiles (about one- third of the stem), and the woody inner portion of the stem known as the hurd. The hurd has much shorter fibres than the bast and accounts for about two-thirds of the stem. At the end of the growing cycle, the plant forms seed heads, which contain seeds, seed oils, and the cannabinoid CBD. As will be seen in the cultivation section, different cultivars have different characteristics for hurd, bast, and seed properties; and different planting densities are adopted to encourage the desired characteristics (Table 1). Importantly, these different plant and cultivation traits suggest that differentiating between industrial hemp and marijuana is not as challenging as critics suggest and the crops would not look similar when cultivated for their specific end uses.

Hemp vs Marijuana in pictures



Categorizing Cannabis as either Hemp or Marijuana is akin to classifying all fruits in the citrus genus as either sweet or sour, without acknowledging the diverse characteristics of each fruit.

Hemp



Marijuana

Carbon Credits:

The Role of Industrial Hemp in Carbon Farming

The science behind hemp as a carbon sink
One hectare of industrial hemp can absorb 22 tonnes of CO2 per hectare.
It is possible to grow to 2 crops per year so absorption is doubled.
Hemp's rapid growth (grows to 4 metres in 100 days) makes it one of the fastest CO2-to-biomass conversion tools available, more efficient than agro-forestry.

Biomass is produced by the photosynthetic conversion of atmospheric carbon. The carbon uptake of hemp can be accurately validated annually by calculations derived from dry weight yield. This yield is checked at the weigh-bridge for commercial reasons prior to processing.

Highly accurate figures for total biomass yield and carbon uptake can then be made, giving a level of certainty not available through any other natural carbon absorption process.

Table 4: Criteria for selection of offset standards

Criteria	Questions to be answered for each standard	Comments
Environmental integrity	Are emission reductions real? Are emission reductions permanent? Can the emission reduction be verified?	The CDM, VCS and GS all comply with this criterion as the principle of emission reduction calculation is very well established. Projects can reduce emissions in any of the Kyoto gasses Proving permanence is a difficult point for some types of projects, such as land-based and forestry projects. Emission reductions achieved by standard CDM projects are permanent, but not those achieved by afforestation/reforestation CDM projects. The VCS addresses the permanence issue in a realistic way through risk assessments and provisions for the risks, like buffer accounts. This issue is addressed in the verification requirements of each standard. Some of these requirements can, however, present a disproportionate burden.