

Technology in medical cannabis production: Challenges and opportunities for development in Lesotho

M. Sabrina De Gobbi (International Labour Organization); Motselisi C. Mokhehi, Regina M. Tetsane, Maseabata Ramathebane, Mpheteli Malunga (National University of Lesotho)

Abstract

An ILO research project investigated on technology in medical cannabis production in Lesotho. The new industry seems promising in terms of exports. However, it can boost development only if linkages between foreign-owned and national enterprises are established and if the national education and training system includes courses and programmes on medical cannabis and pharmaceutical research.

Introduction

This policy brief is based on findings from a research project by the International Labour Organization which started in January 2020 and is coming to an end in early 2022. The project's final output is the publication of a book titled "Exploring decent work in the pharmaceutical industry: Job creation in medical cannabis production in Lesotho and Zimbabwe". It was implemented in partnership with the National University of Lesotho and the University of Zimbabwe.

Knowledge and innovation are playing an increasingly significant role in economic growth worldwide. Multinational enterprises and international partnerships play a significant role in technological progress and knowledge transfer, particularly in poor countries. However, public support is necessary for the diffusion of basic technologies and for advanced research activities (World Bank, 2007). Stiglitz (2017) highlights the important role of governments in promoting learning and innovation. State support is particularly relevant for tailoring technologies to local needs, for facilitating knowledge transfer and for "leapfrogging" earlier stages of technology.

A knowledge-based economy relies on knowledge-intensive and high value-added manufacturing, manufacturing-related services and exportable services (Yue, 2001). Oluwadare (2015) adds that knowledge economies depend on investment in new technology, high-technology industries and highly skilled labour. It is in the light of national manufacturing capacity that technology is considered in this brief.

The emerging world market for medical cannabis is projected to expand by a compound annual growth rate of over 20 per cent between 2021 and 2026. It was estimated to be worth US\$16.47 billion in 2021 and is expected to reach US\$46.18 billion in 2026 (Market Data Forecast, 2021).

The focus of this brief is the development of the medical cannabis industry in Lesotho, the first country which legalized medical cannabis production in Africa. Primary and secondary data are used to shed light on the extent to which knowledge is being transferred from foreign-owned companies to local employees and on the degree to which medical cannabis production can contribute to the development of a poor country.

Outline of empirical facts and issues

In Lesotho, the 2008 Drugs of Abuse Act allows cannabis to be legally cultivated for medicinal purposes. Further regulations have been developed to license and regulate the operation of medical cannabis companies, namely the Drugs of Abuse (Cannabis) Regulations, 2018, and their amendment of 2019. The use of medical cannabis in the country remains unregulated.

In 2018, Lesotho adopted a National Strategic Development Plan II (NSDP II) for 2019–23. The document states explicitly that an export-led growth model has been endorsed (Government of Lesotho, 2018). No mention is made of medical cannabis production, which was launched in Lesotho at the same time as the Plan was being formulated. Proper legislation on medical cannabis production was not adopted until 2018, and some issues still remained unresolved afterwards, such as how to create effective partnerships between national and foreign investors (Vickers, 2019).

The successfully developed textile sector in the country is a low-technology industry that cannot easily serve as a model for knowledge transfer. The area of pharmaceutical production (including medical cannabis), which is a high-technology industry, is completely ignored by the national education and training system. The NSDP II includes a Research and Innovation Strategy, but so far nothing has been heard about the implementation of such a strategy for the pharmaceutical sector or even just for medical cannabis production. Institutions of higher learning require a

licence to conduct research on medical cannabis, yet the National University of Lesotho (NUL) has none.

Licences were first granted in 2017. As of July 2021, there were at least eight registered and licensed businesses in the country (Mpaki, 2019). The managers of three of them were surveyed for this research, as well as 46 of their employees out of a total of 103.

The countries of origin of the investors of the three companies are Canada, United States, United Kingdom, South Africa and Lesotho. Most workers are men. Indeed, 56.5 per cent are male and 43.5 per cent are female. It is a rather young labour force, in which 58.7 per cent are aged 25–34 years and 19.6 per cent are 35 to 44 years old. Interestingly, almost all the employees surveyed were Lesotho nationals: locals accounted for 97.8 per cent of the sample group and South Africans for just 2.2 per cent. The labour force is also quite well educated: 57.1 per cent of the employees surveyed had tertiary education and 28.6 per cent had secondary school qualifications.

It is worth noting that, particularly in the cannabis industry, technology transfer and knowledge transfer refer not only to equipment, but rather to a much broader range of elements comprising whole systems and their constituent parts, including know-how, goods and services, equipment, and organizational and managerial procedures (Tébar Less and McMillan, 2005). Primary data collected from the three medical cannabis companies surveyed in Lesotho help in understanding whether and how technology transfer is taking place in the industry.

An overwhelming majority of the employees surveyed, namely 91.1 per cent of the total, reported that they learned how to perform new tasks by doing them. The managers interviewed confirmed that most workers were trained on the job. Internships are offered to some students from the NUL, Lerotholi Polytechnic and various South African universities. These interns are subsequently often recruited by the companies that trained them.

Similar shares of employees stated that they acquired new knowledge by considering best practices and lessons learned from past experiences (77.3 per cent) and by reading manuals and documentation (75.6 per cent). A manager mentioned that workers were encouraged to read literature on cannabis provided by the enterprise, which explained various concepts that they were expected to apply when going about their jobs. Interestingly, formal training is the method least used to impart knowledge.

Workers were also asked to express their views on the attitude of their managers/supervisors with respect to

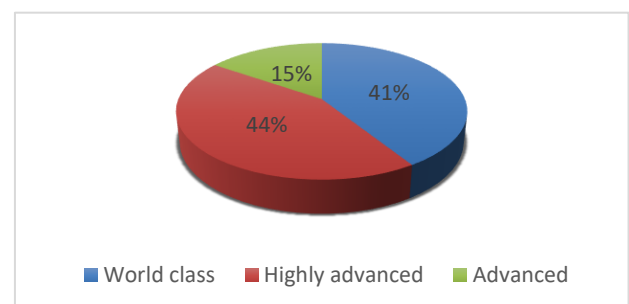
sharing knowledge. Over 85 per cent of employees concur that their managers/supervisors show them ways of developing their skills, clearly explain tasks and responsibilities, and help them to apply acquired knowledge and skills in their day-to-day activities. Furthermore, over 80 per cent of workers believe that their managers/supervisors have the ability to share and transfer knowledge and skills, and are making an effort to transfer what they know to their subordinates.

A local manager reported that knowledge transfer occurred mainly through reading and the provision of teaching for employees. He had recruited an expatriate expert from a medical cannabis firm to train his workers, but the knowledge transfer experiment had failed, as foreigners did not seem to be interested in training locals. His company had experienced difficulties in attracting foreign investors other than from South Africa, where the level of expertise in medical cannabis is not as high as that found in companies from North American or European countries. The two other companies surveyed are able to benefit from the expertise of expatriates who are on their staff.

More details were captured through interviews on various aspects of technology, which include cannabis testing, greenhouses, lighting in greenhouses, cannabis irrigation, and drying and tracking cannabis plants. It should be noted that some enterprises make use of more sophisticated technology than others. These tend to be larger firms with greater access to foreign investment from North America and Europe. One of them has obtained good manufacturing practices (GMP) certification, which is important for exporting. Thanks to that accreditation, Lesotho is among the 20 countries in the world to have GMP certification for medical cannabis production.

Employees were asked to rate the overall quality of their enterprises' production equipment. As can be seen in the following chart, the largest share of respondents, 44 per cent, consider that the machinery used is highly advanced.

Figure 1. Perceptions of employees regarding the quality of medical cannabis production equipment in Lesotho (percentage)



Source: Survey conducted under ILO research project, 2021

The medical cannabis industry is capital-intensive and not many jobs are directly created. Nevertheless, in Lesotho, it would be possible to set up enterprises to fill the existing gaps in local supply of irrigation equipment, greenhouses, generators, farming equipment, nutrients and fertilizers (Prohibition Partners, 2019).

From the point of view of export-led industrialization, medical cannabis would seem to be promising, since there are major foreign investors offering access to the profitable markets in North America and Europe. The problem in this case is that the industry remains in the hands of foreign companies that do not have linkages with domestic entrepreneurs. Exports may therefore secure a few jobs and a certain amount of revenues and foreign exchange for the host country, but they do not contribute much to its economic development, where improved knowledge and capabilities are key.

Policy recommendations/Conclusions

The medical cannabis industry can very much contribute to national development, as long as control over production and exports does not remain entirely in the hands of foreign investors. In Lesotho, the emerging industry seems to be totally disconnected from local enterprises and education, training and research institutions. The Government there should play a much stronger role by introducing conditions that would encourage foreign investors to collaborate with domestic businesses, and by supporting, through funding and policies, the enhancement of the research capacity of the NUL and other relevant institutions. Local firms should also receive government support so that they are able to offer their services to foreign investors. Special incentives could be granted to enterprises engaged in specific economic activities, sectors and subsectors that have linkages with the medical cannabis industry.

Although still in its infancy, the medical cannabis industry in Lesotho seems to be growing quite rapidly and successfully. To avoid missing this opportunity for national development, the country must take immediate action to build the necessary skills and knowledge so that its citizens can become actively involved in the industry. Training in pharmaceutical production skills must be introduced in the pharmaceutical courses

offered by the NUL or through dedicated training programmes at other institutions. Furthermore, national research capacity must be strengthened by increasing the level of funding, setting up new research centres and developing the NUL innovation hub.

Only companies backed by substantial foreign investment can afford satellite internet connections and solar power facilities, for example. Providing such basic infrastructure should be a priority for the Government. In addition, public-private partnerships could be promoted, in which private enterprises benefiting from foreign capital can partly finance the local public provision of the aforementioned services.

References

- Government of Lesotho, 2018, National Strategic Development Plan II: 2018/19–2022/23
- Market Data Forecast, 2021, “Medical Cannabis Market Size, Trends and Growth: 2021 to 2026”
- Mpaki B., 2019, “Medical Cannabis Industry Reacts to Licence Fee Hike”, Lesotho Times, 9 March 2019
- Oluwadare A. J., 2015, “Towards a Knowledge-Based Economy: Challenges and Opportunities for Nigeria”, Paper presented at Second Covenant University Conference on African Development Issues, Ota, Nigeria, 11–13 May 2015
- Prohibition Partners, 2019, The African Cannabis Report
- Stiglitz J. E., 2017, “Industrial Policy, Learning, and Development”, in *The Practice of Industrial Policy: Government–Business Coordination in Africa and East Asia*, edited by John Page and Finn Tarp, 23–39, Oxford: Oxford University Press
- Tébar L. C. and McMillan s., 2005, “Achieving the Successful Transfer of Environmentally Sound Technologies: Trade Related Aspects”, OECD Trade and Environment Working Paper No. 2005-02
- Vickers E., 2019. “The Small African Kingdom That’s Perfect for Growing Cannabis, but Maybe Not for Regulating It”, Quartz Africa, 9 November 2019
- World Bank, 2007, *Building Knowledge Economies: Advanced Strategies for Development*
- Yue C. S., 2001, “Singapore: Towards a Knowledge-Based Economy”, in *Industrial Restructuring in East Asia*, edited by Seiichi Masuyama, Donna Vandenbrink and Chia Siow Yue, 169–208, Institute of Southeast Asian Studies and Nomura Research Institute