Labuan Bulletin of International Business & Finance

Volume 21 Issue 1 eISSN 2600-7894



## COFFEE PRODUCTION AND ITS CONTRIBUTION TO SUSTAINABLE DEVELOPMENT IN MALAYSIA

Ahmad, Hanis Hazwani<sup>a\*</sup>, Wei Chern, Ang<sup>b</sup>, Saleh, Siti Khadijah<sup>c</sup>

 <sup>a</sup> Faculty of Business and Management Science, Kolej Universiti Islam Perlis, Perlis, Malaysia.
<sup>b</sup> Clinical Research Centre, Hospital Tuanku Fauziah, Ministry of Health, Perlis, Malaysia
<sup>c</sup> Intec Education College, Selangor, Malaysia

\*Corresponding author's email: anyshazwanie@gmail.com

#### ABSTRACT

Coffee planters face competition with other cash crops and higher production costs. Besides that, the biggest issue in this sector is the labour required to select ripe coffee beans since not all beans in a single stalk of coffee mature simultaneously. Nonetheless, this well-known beverage is facing a sustainability dilemma. This paper uses previous studies on coffee production and sustainability in Malaysia. A continuous drop in global coffee prices has squeezed coffee growers and pushed many of them below the worldwide severe poverty level. This document discusses research on sustainability in the coffee industry, including past study findings, and makes various recommendations. These obstacles must be solved to achieve sustainable coffee production. All types of literature (including grey literature) were searched exploratively by including those published in the past ten years from 2011 to January 2022 and in the English language. The adoption of sustainable production practices is vital for ecosystem and biodiversity protection, as well as assuring long-term supply availability of coffee production in Malaysia. Implementing sustainability in the coffee certificate in Malaysia's coffee production system appears to be the most appropriate approach to addressing these challenges because it can synergise increasing productivity and farmers' income, implementing climate change adaptation and mitigation, and increasing farmer capability and credit access. The originality of this study is its reviews of how to sustain the coffee production in the Malaysian agriculture sector.

## JEL classification: M, Q1.

*Keywords*: Coffee production, sustainable, sustainable coffee certification, climate change.

Received: June 22, 2022 Revised: February 21, 2023 Accepted: February 21, 2023

## **1. INTRODUCTION**

Coffee, along with tea and water, is still one of the world's three most popular beverages. In terms of global product commerce, it is only second to fossil fuels (Murthy and Naidu, 2012). Coffee generates incomes for at least 60 million people around the world. However, this popular beverage faces a sustainability crisis: a continuous drop in global coffee prices has pushed many coffee growers below the worldwide severe poverty threshold. This document includes research on sustainability in the coffee industry, including prior study findings and various recommendations.

Urbanisation and busy lifestyles are some of the reasons that have caused the rise in coffee consumption in Malaysia. In Malaysia, coffee drinking culture has been part of daily lives to improve productivity. 'Coffee was first introduced during the British colonial era, setting the grounds for *kopitiams* (coffee shops in the Chinese Hokkien dialect). Malaysians have since owned this beverage by roasting with butter and sugar and then made by pouring boiling water through a cloth filter, rather than brewing it in the rest of the world.

As of right now, Malaysia has just approximately 2,000 coffee producers, with the majority concentrated in just three states: Kedah, Johor, and Sabah (Department of Agriculture, 2021). Most coffee varieties grown are liberica and robusta. According to the Khazanah Research Institute (2019), Malaysia's coffee production was small at 3,369 metric tonnes (MT) in 2018. From 2010 to 2018, production declined by an average of 16 per cent per year. Coffee planters face a few challenges, such as competition with other cash crops and higher production costs. Besides that, the most significant challenge in this business is the availability of sufficient people to select ripe coffee beans because not all beans on a single stalk of coffee will ripen simultaneously.

Consuming coffee in moderation has been shown to lessen the risk of heart disease and cancer, and this has been attributed to the beneficial characteristics such as antioxidant content (Gomez-Ruizet al., 2007), antibacterial (Meckelburg et al., 2014), remedial effects on type 2 diabetes (Akash et al., 2014), anti-obesity and antiinflammatory (Jia et al., 2014). The advantages and the demand for the beverage is expected to rise.

Aside from unpredictability and drought, it is projected that the coffee supply chain would be impacted, particularly in terms of harvesting and processing activities. It is possible that improper management of its by-product would result in widespread water quality degradation, which will have severe consequences for the water resources of major coffee growers across the world and hurts the income of manufacturers. Because of the crops' vulnerability to temperature increases and water scarcity, the agricultural industry is likely to be significantly impacted by climate change (Mendelsohn, 2008; Ramirez-Villegas and Challinor, 2012). The apparent negative impacts include a decrease in agricultural yield and quality, as well as an increase in pest and disease infestation, which results in a drop in crop output throughout the world as a result (IPCC, 2014). For smallholder farmers, many of whom are reliant on rain-fed crops and have little access to financial and technical assistance, these present considerable obstacles (Cohn et al., 2017; Holland et al., 2017). This may assist them in responding to changing climate circumstances.

Furthermore, coffee plantations have an average lifespan of 30 years and maybe productive for more than 50 years (Bunn et al., 2015), thus a good investment. However, their vulnerability to the effects of climate change and variability is anticipated to be increased. Smallholder coffee producers are particularly vulnerable to climate change

since adaptation in perennial crops such as coffee can take many years, or even several decades, to take effect (Laderach et al., 2017). From a socioeconomic perspective, it is critical to understand the extent of climate change's impact on coffee production and the benefits of potential adaptation strategies to increase coffee productivity and profitability, thereby sustaining the livelihoods of smallholder producers worldwide.

This conundrum poses a serious threat to the country's coffee production survival. Climate variability and change exacerbate the difficulties inherent in coffee cultivation. Climate change and variability have resulted in a downward trend in coffee output (Camargo, 2010; Zullo et al., 2011; Chengappa & Devika, 2017; Syakir & Surmaini, 2017; Pham et al., 2019). Coffee is a perennial crop that is subject to climate change. The majority of coffee species are grown in rain-fed locations that are more sensitive to climate change (Gunathilaka et al., 2018). Climate change will continue to be the primary impediment to the growth of coffee in the future, owing to the extraordinary sensitivity of coffee plants to climatic conditions and their long lifespan. As a result, good techniques should be established to ensure the adaptation of the coffee plants, given the significant upfront capital expenses involved with crop movement.

The adoption of sustainable production practices is key for ecosystem and biodiversity protection, as well as assuring the availability of a long-term supply (Grabs, 2018). Therefore, sustainability programmes leading to certification from plantation to supply chain conforming to specific requirements raise a question mark of whether producers can benefit from the programmes through incentive or premium pricing (Sarvina et al., 2021; Jena et al, 2012). The challenges of sustainability coffee certification are also faced in Indonesia (Sarvina et al., 2021) on increasing productivity by having good adaptation and mitigation measures.

Certification is a market-based tool that is increasingly being utilised throughout the world to advance socioeconomic and environmental goals. Certified products and value chains must meet pre-determined socioeconomic and environmental sustainability criteria. Even though organic-certified coffee has fetched higher prices, as shown in our study, the lower yield of organic coffee more than compensates for this price premium (Jena & Grote, 2017). Certified farmers, on the other hand, had much higher average coffee income and total income (PPP\$ 182) than uncertified farmers (Karki, Jena & Grote, 2016). Fairtrade cooperative members had yield and pricing benefits over non-certified farmers in the Indian case study (Jena & Grote, 2022). As a result, accredited growers' net revenue from coffee has increased.

This article discusses the problems and constraints facing Malaysia's coffee production system, the influence of climatic variability and climate change on coffee production, and the need of promoting sustainable coffee certification in Malaysia.

#### 2. MAIN SECTIONS

This article is written as a narrative review. The latest statistics of the consumption and production of coffee in Malaysia, the types of coffee beans used with the corresponding case studies were obtained from official open data resources, such as organisational and governmental websites. Case studies of coffee production on Malaysia's sustainable development were searched exploratively by including all types of literature (including grey literature) published in the past ten years from 2011 to January 2022 and in the English language available in full text from Google and Google Scholar. No relevant scholarly articles were found. However, five references published in news portal met the inclusion criteria.

## **3. DISCUSSION**

## **3.1. Coffee Industry in Malaysia**

Malaysians consumed 800,000 of 60 kg bags of coffee in 2021 and 2022 that shows in Figure 1 (Department of Statistics Malaysia [DOSM], 2022). Warm drinks such as tea and coffee have been a part of most Malaysians' everyday life. Traditionally, the elderly drank coffee at their local kopitiams or coffee shops. On the other hand, Malaysians living abroad acquired the coffee drinking culture began to spread a café culture. Furthermore, the growth of worldwide retail café enterprises e.g., Starbucks® and The Coffee Bean & Tea Leaf, as well as local coffee shop chains e.g., Oldtowns White Coffee, added to its appeal among the younger population. Malaysia's main coffee bean varieties are liberica, which accounts for most of its cultivated coffee beans, and Robusta. Malaysia produced 2.1 million 60 kilogramme bags of coffee in 2018. Malaysia imports coffee from its neighbouring nation of Indonesia to meet domestic and worldwide demand.



## Figure 1: Total coffee consumption in Malaysia from 2013-2022 (DOSM, 2022)

Natural coffee habitat deterioration, along with changes in weather patterns, can have a severe influence on coffee genetic resources as well as the livelihoods of millions of people worldwide. To address challenges in global climate change and financial crisis, having coffee diversity is crucial. The relevance and risk of exploiting natural resources for development and human well-being relate to the sustainability of environment, social and economy. The diversity of coffee genes and ecosystems, traditional farming practices, and technological breakthroughs such as climate change adaptation measures must be used in Malaysia to create higher-quality coffee varieties and remain competitive.

# **3.2.** The Importance of Coffee Production to Economic Development and Sustainable

Coffee is a vast agricultural commodity produced in roughly 80 tropical countries. It was estimated that 125 million people in Latin America, Africa, and Asia are dependent on it for a living and an annual production of around nine million tonnes of green beans. The genus Coffea (Rubiaceae-Ixoroideae, Coffeeae) has at least 125 species and is found in Africa, Madagascar, the Comoros Islands, the Mascarene Islands (La Reunion and Mauritius), tropical Asia, and Australia. C. arabica L. (Arabica coffee) and C. canephora

A. Froehner are two economically important species for manufacturing the beverage of robusta coffee. The human population pressures land conversion to agriculture, deforestation, and land degradation. Low coffee prices lead to the abandonment of coffee trees in forests and shifting cultivation to other more remunerative crops. Climate change increases the incidence of pests and diseases, drought and unpredictable rainfall patterns. All of these reasons put livelihoods at risk in many coffee-growing areas. In recent years, the economics of coffee production has shifted, with worldwide market prices falling and input costs rising. Simultaneously, demand for speciality coffee is at an all-time high. To make coffee production more sustainable, the focus should be placed on enhancing coffee quality through sustainable, ecologically friendly farming techniques, ultimately resulting in better net returns.

Malaysia selected coffee as a commodity that ought to be developed in its Third National Policy (NAP3, 1998-2010) (Federal Agricultural Marketing Authority, nd) (Food and Fertilizer Technology Center for the Asian and Pacific Region, 2016). The strategy includes increased productivity and competitiveness of the coffee growing sector by developing links with coffee brewing and roasting sectors, creating new sources of growth for the industry, and sustainable conservation and use of natural resources (Federal Agricultural Marketing Authority, n.d.). According to the findings, coffee consumption in Malaysia is expanding. It would benefit the country to boost its coffee production, which accounts for 0.16 percent of global coffee production. This would provide a new source of income for struggling farmers, and also foster the development of locally brewed speciality coffee, which would benefit the Malaysian economy in the long run.

Malaysian producers' most prominent issue is selling their coffee beans at a reasonable price to local purchasers. Coffee beans are non-perishable and cost less to grow than vegetables. Farmers are promoted to plant coffee if they can sell their beans for a higher price. Conveying positive comments from downstream companies can instil confidence in farmers, allowing them to offer high-quality beans to downstream players such as local roasters. Local roasters have difficulty obtaining high-quality coffee beans since they must import them from other countries, which has higher overhead costs. Therefore, purchasing premium coffee beans from local farmers is more viable. Sabarica, the producer of the state of Sabah's arabica coffee species, is an attempt to raise awareness among local roasters on the availability of arabica coffee beans in Sabah to enhance the local coffee plants with the support of Sabarica as of January 2020. Furthermore, Sabarica attempts to develop various arabica coffee varietals in Sabah, including Gesha coffee. Arabica beans are in high demand on the market, which means producers can get a better price (The Edge Markets, 2020).

Another area to be looked into is to change perceptions of liberica coffee, the most widely grown in Malaysia. According to the Perfect Daily Grind (2019), liberica plants were re-established by a Sarawak-based café named Earthlings Coffee Workshop. As a result, public cuppings are held in their specialty coffee stores so that customers may learn more about liberica flavours. They serve as discovery centres and a speciality coffee stores, where roasting and processing techniques are tested to improve the taste of liberica. The world's first liberica roasting competition was hosted in 2019 as a pilot project to explore the diverse flavour potentials with different roasting procedures (Perfect Daily Grind, 2019). Liberica was chosen as a viable option against climate

change threat to wild coffee diversity while helping the local economy (Perfect Daily Grind, 2019).

Another case example is a cafe named My Liberica cafes in the state of Johor. Robusta and liberica are thought to be of bad quality due to poor handling by farmers and traders during processing (ThirstMag, 2018). My Liberica cafés not only continue to create new recipes to stay up with the coffee trend, but they also use every part of the plant to prepare drinks and fertilisers, such as the cascara (coffee cherry shell), leaves and blossoms (ThirstMag, 2018). This is just another way the coffee cultivation sector achieves sustainability.

In order to commit with the sustainable quality, campaign activity was held with the theme which is "Nescafe Grown with respect, savoured with love". This campaign highlights the care the brands take to ensure the quality of every bean used in its product to satisfy coffee lovers. Moreover, this is part of to deliver a great cup of coffee to consumers and at the same time to be the part of commit brand to create sustainable coffee ecosystem in respect for farming communities. During the campaign Nescafe has fully transitioned to use only 100% 4C certified coffee beans for all its products produced in Malaysia. This 4C code of Conduct is an internationally recognised sustainability standard for the entire sector to drive sustainability in coffee supply chains (Thestar.com).

#### 4. CONCLUSION

The purpose of this article is to evaluate the literature on the influence of climate change on coffee production and sustainability in Malaysia, as well as to identify critical knowledge gaps on the subject. These include the disproportionate emphasis of recent research in the Americas, with less attention paid to Asia, where numerous nations are important coffee growers. Recent research on coffee production and climate change have discovered many largely negative consequences. The primary constraints on coffee production in Malaysia include poor productivity with significant output volatility, climate unpredictability and change, a lack of capital and credit, and farmers with limited capacity. The complexity and diversity of the issues associated with coffee production necessitate a site-specific strategy.

Additional study on the distribution of coffee-friendly space is vital to assist sustainable coffee growth, considering potential ecological and socioeconomic implications, as well as associated possibilities and difficulties (Pham et al., 2019). Given the coffee sector's substantial contribution to global socioeconomic development, particularly to the lives of millions of smallholder farmers, further study on the climate-related implications on coffee production systems is essential. This should concentrate on the direct and indirect impacts of adaptation on yield, particularly in production locations throughout Asia, on Robusta coffee, and on the transformation in ensuring the coffee industry's sustainability and profitability.

#### ACKNOWLEDGEMENT

The author wishes to express her gratitude to the Editor and all reviewers who contributed to this research.

## **DECLARATION OF COMPETING INTEREST**

The author states that she is conscious of any competing interests that could have impacted the work presented in this publication.

#### REFERENCES

- Abdul Wahab, M. A. M & Mohammad Nor, N. A. (2016). Exploring the potentials of coffee industry in Malaysia. Food and Fertilizer Technology Center for the Asian and Pacific Region. Retrieved at <u>https://ap.fftc.org.tw/article/1005</u>.
- Akash, M. S. H., Rehman, K., & Chen, S. (2014). Effects of coffee on type 2 diabetes mellitus. *Nutrition*, 30(7-8), 755-763.
- Bunn, C. L. P. Ovalle, R. O, Kirschke, D. (2015). A bitter cup: climate change profile of global production of Arabica and Robusta coffee. Climate Change. 129:89–101. <u>https://doi.org/10.1007/s10584-014-1306-x</u>
- Camargo, M. B. P. (2010). The impact of climate variability and climate change on arabic coffee crop in Brazil. Bragantia, 69(1), 239-247.
- Chengappa, P. G., & Devika, C. M. (2017). Climate variability concerns for the future of coffee in India: An exploratory study. International Journal of Environmental, Agriculture and Biotechnology, 1(4), 819- 826. <u>https://doi.org/10.22161/ijeab/1.4.27</u>
- Chong. K, (2018, September 16). Malaysia is growing that rare coffee beans that comprises the 1% of world production. *Thirstmag.com*. Retrieved from <u>https://thirstmag.com/drinks/My-Liberica-Coffee-Farm-in-Johor</u>
- Cohn AS et al (2017) Smallholder agriculture and climate change. Annual Review Environment Resource. 42:347–375. <u>https://doi.org/10.1146/annurev-environ-102016-060946</u>
- Department of Statistics Malaysia [DOSM] (2022). Household income & basic amenities survey report. Retrieved from <u>https://www.dosm.gov.my/</u> > cthemeByCat.
- Federal Agricultural Marketing Authority (2021, August 8). Third National Agricultural Policy (DPN 3). Retrieved from <u>https://www.fama.gov.my/en/dasar-pertanian-negara-ketiga-dpn3</u>.
- Gomez-Ruiz, J. A., Leake, D. S., & Ames, J. M. (2007). In vitro antioxidant activity of coffee compounds and their metabolites. *Journal of agricultural and food chemistry*, 55(17), 6962-6969.
- Grabs, J. (2020). Assessing the institutionalization of private sustainability governance in a changing coffee sector. *Regulation & governance*, *14*(2), 362-387.
- Gunathilaka, R. P. D., Smart, J. C. R., & Fleming, C. M. (2018). Adaptation to climate change in perennial cropping systems: Options, barriers and policy implications. Environmental Science and Policy, 82, 108-116. <u>https://doi.org/10.1016/j. envsci.2018.01.011</u>
- Holland MB et al (2017) Mapping adaptive capacity and smallholder agriculture: applying expert knowledge at the landscape scale. Climate Change. 141:139–153. https://doi.org/10.1007/s10584-016-1810-2ICO
- Jena, P. R., & Grote, U. (2022). Do Certification Schemes Enhance Coffee Yields and Household Income? Lessons Learned Across Continents. *Frontiers in sustainable food systems 5 (2022), 5, 716904.*
- Jena, P. R., Chichaibelu, B. B., Stellmacher, T., & Grote, U. (2012). The impact of coffee certification on small-scale producers' livelihoods: a case study from the Jimma Zone, Ethiopia. *Agricultural economics*, *43*(4), 429-440.
- Jena, P. R., Stellmacher, T., & Grote, U. (2017). Can coffee certification schemes increase incomes of smallholder farmers? Evidence from Jinotega, Nicaragua. *Environment*, *Development and Sustainability*, 19(1), 45-66.
- Jia, Y., Shelhamer, E., Donahue, J., Karayev, S., Long, J., Girshick, R., & Darrell, T. (2014, November). Caffe: Convolutional architecture for fast feature embedding.

In *Proceedings of the 22nd ACM international conference on Multimedia* (pp. 675-678).

- Karki, S. K., Jena, P. R., & Grote, U. (2016). Fair trade certification and livelihoods: A panel data analysis of coffee-growing households in India. *Agricultural and Resource Economics Review*, 45(3), 436-458.
- Kwok, R, Lee, K & Riman, R. M. (2019, May 23). How the Malaysian state of Sarawak is rethinking liberica coffee. <u>https://perfectdailygrind.com/2019/05/how-the-malaysian-state-of-sarawak-is-rethinkinglibericacoffee</u>
- Laderach, P., Ramirez-Villegas, J., Navarro-Racines, C., Zelaya, C., Martinez-Valle, A., Jarvis, A. (2017) Climate change adaptation of coffee production in space and time. Climate Change. 141:47–62. <u>https://doi.org/10.1007/s10584-016-1788-9</u>
- Meckelburg, N., Pinto, K. C., Farah, A., Iorio, N. L. P., Pierro, V. S. S., Dos Santos, K. R. N., & Antonio, A. G. (2014). Antibacterial effect of coffee: calcium concentration in a culture containing teeth/biofilm exposed to Coffea Canephora aqueous extract. *Letters in applied microbiology*, 59(3), 342-347.
- Mendelsohn R (2008) The impact of climate change on agriculture in developing countries. Journal National Resource. Pol Res 1:5–19. https://doi.org/10.1080/19390450802495882
- Murthy, P. S., & Naidu, M. M. (2012). Sustainable management of coffee industry by products and value addition—a review. Resources, Conservation and Recycling, 66, 45–58.
- Nestle (2020). Farming the best homegrown coffee beans from Kedah. Nestle websites. Retrieved from <u>https://www.nestle.com.my/stories/kedah-coffee-beans</u>
- Pham, Y., Reardon-Smith, K., & Cockfield, G. (2019). The impact of climate change and variability on the Coffee Production: A systematic review. Climatic Change, 24(2), 173-188. <u>https://doi.org/10.1127/metz/2015/0530</u>
- Ramirez-Villegas J, Challinor A (2012) Assessing relevant climate data for agricultural applications. Agriculture For Meteorology. 161:26–45. https://doi.org/10.1016/j.agrformet.2012.03.015
- Ranjan Jena, P., & Grote, U. (2017). Fairtrade certification and livelihood impacts on small-scale coffee producers in a tribal community of India. *Applied Economic Perspectives and Policy*, 39(1), 87-110.
- Sarvina, Y., June, T., Sutjahjo, S. H., Nurmalina, R., & Surmaini, E. (2021). Why Should Climate Smart Agriculture Be Promoted In The Indonesian Coffee Production System?. *Journal of Sustainability Science and Management*, 16(7), 347-363.
- Syakir, M., & Surmaini, E. (2017). Perubahan iklim dalam konteks sistem produksi dan Pengembangan pengembangan kopi di Indonesia. Jurnal Litbang Pertanian, 36(2), 77-90. <u>https://doi.org/10.21082/jp3.v36n2.2017</u>
- The Edge Markets (2020). Cover Story: wake up and smell the Sabarica Retrieved May 31, 2021, <u>https://www.theedgemarkets.com/article/cover-story-wake-and-smell-sabarica</u>
- Zullo, J., Hilton, J., Pinto, S., Delgado, E., Maria, A., & Avila, H. De. (2011). Potential for growing Arabica coffee in the extreme south of Brazil in a warmer world. Climatic Change, 109, 535-548. https://doi.org/10.1007/s10584-011-0058-0.