



Assessing the Economic Impacts of Constraints Encountered by the Small holder Coffee Farming Communities in Goroka District in Eastern Highlands Province in Papua New Guinea

N.B: The author appreciates the research assistance received from Ms. Jomino, Mr. Won and Mr. Rex and all other support were received from third and final year Economics special degree students in batches from 2023 to 2025 in the Export Crop Research Cluster at PNGUoT.

Purpose of the Study

Coffee is Papua New Guinea (PNG)'s second-largest agricultural export, after oil palm, and it employs approximately three million people. In terms of land usage, it covers around 40000 hectares and produces around 1% of world coffee production and is the second-largest producer of washed arabica coffee in Asia and the Pacific region. Coffee ranks as the second most significant agricultural product, making up over a 13% of the total agricultural export revenue (156 USD millions for 2024) in PNG. Most of the coffee is grown in the Eastern Highland Province, the Western Highland Province, and the Simbu areas, but in all these areas, significant portion of harvest is stolen due to the country's deteriorating law and order and increasing inequality and poverty situation (Coffee Industry Corporation Limited, 2023). However, these coffee cultivation and processing communities are increasingly facing the challenges posed by climate change, non-availability of agricultural inputs with proper government intervention, and the non-existence of economic success factors conducive to coffee cultivation. Climate change is characterized by shifts in temperature, unknown emerging crop diseases, changing rainfall patterns, and extreme weather events, all of which can have profound effects on coffee production and quality (Bilan, C. and et.al, 2022). Furthermore, the non-availability of agricultural inputs with appropriate government interven-

tion, and the non-existence of economic success factors work as impediments to the growth of this important cash crop. In this context, this study assesses the overall economic impact of these three themes on smallholder coffee farming communities in Goroka district in Eastern Highland Province (hub of coffee production in PNG), including its implications on coffee factories, processes, and firms involved in the export value chain, and analyzes the profitability and financial viability of smallholder coffee farming operations in this district (Ezebilo, E., and Afolami, C., 2021). Finally, the study recommends potential policy interventions and support systems that can enhance the economic resilience of smallholder coffee-farming communities to climate change, non-availability of agricultural inputs with proper government intervention, and the non-existence of economic success factors conducive to coffee cultivation.

Design/Methodology/Approach

The methodology of this study is mainly a mixed cross-sectional, based on the positivism research philosophy (the deductive research approach), and to a certain extent, a qualitative interview method is also used. The population for the study consisted of smallholder coffee farmers (criteria used to define small holders are number of employment generated/no. Of members of households engaged in coffee cultivation or related works, capital invested, output and the extent of acreage in the Goroka district, while a sample of 100 farmers was selected from 10 different villages within the district. But for security reasons, only semi-urban areas were visited rather than going into the deeper interior of the district. Collected data is analyzed and presented using data visualization techniques rather than high-end econometric model-based analysis. The study involved extensive fieldwork, including interviews with farmers, community leaders, and relevant stakeholders, Apex, and related policy bodies. One of the highest numbers of tribes and languages living in the district is Goroka; therefore, many local translators were used for the interviews and data collection. In general, Papua New Guinea has over 650 tribes and 700 local languages, and some of the coffee-cultivating tribes have very minimal exposure to the outside world and seem like they

are happy to stay at a subsistence level of farming with inward-looking backward attitudes sticking to more traditional cultural values. The main themes identified in this study are the impact of climate change on productivity and the volume of production, the non-availability of agricultural inputs with proper government intervention, and the non-existence of economic success factors conducive to coffee cultivation in this region.

Findings

The findings of this study showed that climate change poses significant threats to this small-scale coffee industry at various magnitudes for various scales farmers. Rising temperatures and changing rainfall patterns can lead to shifts in the suitability of coffee-growing areas, affecting crop yields and quality, the extinction of some varieties, the emergence of many unknown crop diseases, etc. Additionally, extreme weather events such as droughts, floods, and storms can damage coffee plants, disrupt harvesting and processing activities, and increase production costs. These climate-related challenges can have severe economic consequences for smallholder coffee farmers, who often lack the resources and capacity to adapt to such changes. Even other crops are also facing similar climate change-related issues. Therefore, many thefts have increased from well-maintained coffee cultivation from the illicit Pluckers'. The economic impacts of climate change on smallholder coffee farming communities extend beyond the direct effects on crop production and spread throughout the whole value chain. Changes in coffee yields and quality can affect farmers' incomes, as they may receive lower prices for lower-quality beans or face reduced market demand, and many unknown new diseases will ruin some farmers' main income sources. In some localities, crime has increased due to a lack of income opportunities brought by coffee cultivation. Furthermore, other two critical issues encountered by this region's small-scale coffee cultivators are the non-availability of agricultural inputs with proper government intervention, and the non-existence of economic success factors conducive to coffee cultivation in this region. These two constraints

have far-reaching economic implications for the growth and development of the whole industry.

Research limitations and implication

To date, there has been no formal mapping or recent data collection efforts of coffee-growing areas in the country for very many reasons. Therefore, it is impossible to quantify the area under production either at a national or provincial level, and the non-availability of reliable base data is the main limitation of this study. Furthermore, accessibility and security issues can be considered as other limitations of this study to accessing deeper interior coffee farmers in this district. Therefore, rather than going for sophisticated econometric data analysis, data visualization, and descriptive data analysis used, due to the reliability problem of the data and the many discrepancies in the collected data, visiting the district a second time to clean the collected data will increase the cost and time unbelievable. Therefore, the implications of this non-availability of reliable data may create issues regarding the generalization of results. However, this study can be considered one of the pioneering research efforts in the violence-led, high-risk Pacific country of Papua New Guinea.

Practical implications

Climate change is leading to a decline in coffee production and, consequently, the living standards of small-scale farmers in PNG (Christine. B, and et al., 2023). Furthermore, it can disrupt the entire coffee value chain, including collection, transportation, processing, and marketing, leading to additional economic losses for farmers and other stakeholders in the industry. Other two critical issues encountered by these Gorka district small-scale coffee cultivators are the non-availability of agricultural inputs with proper government intervention, and the non-existence of economic success factors conducive to coffee cultivation. Understanding the full extent of economic impact is essential for developing targeted interventions and policies to support smallholder coffee farming communities in Goroka district in Eastern Highlands Province in adapting to and mitigating the effects of climate change and two other critical constraints of the non-availability of agricultural

inputs with government proper intervention, and the non-existence of economic success factors conducive to coffee cultivation. Therefore, this research study fills that existing vacuum in the field for policy-makers to frame the right strategies and policies to address the main issues arising from climate change and the non-availability of agricultural inputs with proper government intervention, and the non-existence of economic success factors conducive to coffee cultivation.

Social implications

The economic impacts of climate change, the non-availability of agricultural inputs with proper government intervention, and the non-existence of economic success factors conducive to coffee cultivation have been recognized as major constraints on the growth of small-scale coffee farmers and the industry in Gorka district. Therefore, this research study can be used as a policy guideline to fill this vacuum by introducing the necessary policy initiatives. By addressing these three issues encountered by small-scale farmer communities in this district, many of the social issues faced by the farmer communities can be solved. As these communities heavily depend on coffee production for their livelihoods, understanding the economic consequences of climate change and two other critical issues is crucial for developing effective adaptation and mitigation strategies (Bracken, P et al., 2023). Therefore, the outcome of this pioneering research is the identification of related issues arising out of climate change, non-availability of agricultural inputs with proper government intervention, and the non-existence of economic success factors conducive to small-scale coffee growers and addressing of these issues with appropriate policies and strategies surely uplift the deteriorating social and economic situation among this district's coffee farming communities.

Originality/Value

Perhaps this is one of the pioneering studies on the impact of climate change, the non-availability of agricultural inputs with proper government and timed intervention, and the non-existence of economic success factors conducive to coffee cultivation in PNG. This study will facilitate developing

appropriate policies and strategies to support the livelihoods of these communities to stop their deteriorating living standards into worse situation. Goroka district is known for its lush landscapes and coffee production, with various scales of coffee growers, processing firms, and other coffee players in the value chain. The smallholder coffee farming communities in Goroka are predominantly rural and rely heavily on coffee as their primary or possibly the main source of income, and most are very subsistence-level farmers without that much knowledge about the latest technological developments in this sector. These communities are interconnected and live in small localities with their own networking enclave community mentality. Overall, the whole region is increasingly experiencing the effects of climate change, which poses significant challenges to the economic stability of these communities (CSIRO and SPREP, 2022) and issues arising from the other two constraints. Therefore, this ground-breaking study shows their vulnerability to climate change, non-availability of agricultural inputs with proper government intervention, and the non-existence of economic success factors conducive to coffee cultivation to improve the overall economic resilience of the coffee farming smallholding sector. The multi-community approach will provide valuable insights into the localized impacts of these constraints with targeted interventions and policies to support these smallholder coffee farming communities in the Goroka

district. This research contributed to the existing knowledge of the economic impacts of climate change, the non-availability of agricultural inputs with proper government intervention, and the non-existence of economic success factors conducive to coffee cultivation in smallholder coffee farming and provided valuable insights and guidelines for sustainable development by creating resilient small-scale coffee farming communities in the agricultural sector in PNG.



Figure 1: Coffee Plucking

Reference

- [1] Christine. B, Daniel. E, Valentina. M, Antonio. T, Serena. M, & Donatella. S., (2023). A Systematic Review on the Impacts of Climate Change on Coffee Agro systems, *Plants* 2023, 12(1), 102; <https://doi.org/10.3390/plants12010102>.
- [2] CSIRO and SPREP (2022). 'NextGen' Projections for the Western Tropical Pacific: Climate hazard-based impacts on coffee production in Papua New Guinea. Technical report to the Australia-Pacific Climate Partnership for the Next Generation Climate Projections for the Western Tropical Pacific project. Commonwealth Scientific and Industrial Research Organisation (CSIRO) and Secretariat of the Pacific Regional Environment Programme (SPREP), CSIRO Technical Report, Melbourne, Australia. <https://doi.org/10.25919/5prg-cx10>.
- [3] Bracken, P., Burgess, P., & Girkin, N.T. (2023). Opportunities for enhancing the climate resilience of coffee production through improved crop, soil and water management. *Agroecology and Sustainable Food Systems*, 47 (8), 1125–1157. <https://doi.org/10.1080/21683565.2023.2225438>.
- [4] Coffee Industry Corporation Limited. (2023). HISTORY OF COFFEE IN PNG, <https://www.cic.org.pg/coffee-inpng/history-of-coffee-in-png/>.
- [5] Ezebilo, E.E., & Afolami, A.C. (2021). Strategies for improving coffee production and processing in Papua New Guinea: Lessons from the top five coffee-producing countries Determinants of coffee production in major coffee producing provinces of PNG: Challenges and Opportunities, No. 184, https://pngnri.org/images/Publications/Discussion_Paper_184.pdf.

Article by

Sarath Dasanayaka

Department of Management of Technology, Faculty of Business, University of Moratuwa, Sri Lanka.