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Fatima A Elhadi
Department of Agricultural
Economics, College of
Agricultural Sciences,
University of Khartoum,
Khartoum, Sudan

Marketability of enset (*Ensete ventricosum*) Products: Post-harvest handling and export potential

Fatima A Elhadi

Abstract

Enset (*Ensete ventricosum*), a staple crop in Ethiopia, holds significant cultural, economic, and nutritional importance in the highland regions of the country. Traditionally, enset is consumed as a local food source through various products such as *kocho* (fermented corm), *bulla* (starch extract), and *amicho* (boiled corm). However, despite its crucial role in local food security, enset has not yet realized its full market potential. This paper explores the marketability of enset products, focusing on post-harvest handling practices and the feasibility of exporting enset-based products. The paper discusses the potential for scaling up enset production for the domestic and international markets, evaluates the challenges and opportunities associated with its commercialization, and proposes strategic improvements in post-harvest processing to enhance the market value and export potential of enset products.

Keywords: *Ensete ventricosum*, Enset, Ethiopia, export potential, marketability, market potential

Introduction

Enset (*Ensete ventricosum*), often referred to as the "false banana," is a perennial herbaceous plant native to the highlands of Ethiopia. This crop holds immense cultural, nutritional, and economic significance in Ethiopia, particularly in the southern and south-western regions where it is grown. Known for its resilience, enset thrives in areas with variable rainfall, drought, and poor soils, making it a key crop for ensuring food security in regions prone to climate variability. Unlike many other staple crops, such as maize or wheat, enset is not just valued for its food-producing capabilities but also for its multifaceted uses across local communities. The corm (underground stem), pseudostem, and leaves are all utilized for a range of purposes, including food, medicine, and even craft materials. This makes enset a valuable resource in the rural economy.

In Ethiopia, enset-based products such as *kocho* (fermented corm), *bulla* (starch extract), and *amicho* (boiled corm) are integral to the diet of millions. *Kocho*, the most widely consumed enset product, is derived from the fermented corm and serves as the main staple food in many parts of the country. The fermentation process not only extends the shelf life of enset but also enhances its nutritional profile by increasing its digestibility and concentration of certain vitamins and minerals. The process of producing *bulla*, a highly nutritious starch extract, also plays a central role in the dietary habits of many rural households. Despite its critical importance, enset has not been fully recognized as a potential marketable commodity, particularly in international markets. While enset products are widely consumed domestically, their marketability remains limited by various challenges related to post-harvest handling, processing, and storage.

The potential for enset to become a significant agricultural export product lies in its underutilized capabilities as a highly nutritious and versatile crop. Enset products, such as *kocho* and *bulla*, can serve as gluten-free, plant-based alternatives to conventional cereals like wheat and rice. In recent years, there has been growing global demand for gluten-free and plant-based foods, presenting a potential niche market for enset products. However, for enset to realize its export potential, significant improvements in post-harvest handling, processing, packaging, and storage are required. At present, the methods used for fermenting, drying, and packaging enset products are often rudimentary and inefficient, resulting in variability in product quality, shorter shelf life, and limited ability to scale production. Post-harvest handling plays a key role in ensuring the quality and safety of enset products.

Corresponding Author:
Fatima A Elhadi
Department of Agricultural
Economics, College of
Agricultural Sciences,
University of Khartoum,
Khartoum, Sudan

For instance, fermentation is one of the most critical steps in the production of *kocho* and *bulla*, but traditional methods of fermentation can be inconsistent and expose the product to environmental contaminants. Sun-drying, another common practice for preserving enset products, may lead to spoilage, contamination, and nutrient loss if not carefully managed. Moreover, the lack of standardized processing methods and quality control procedures in enset production often results in products that do not meet the requirements of international food safety standards. To successfully tap into the global market, Ethiopia must modernize these post-harvest practices by introducing controlled fermentation, improved drying techniques, and advanced packaging solutions. These changes will ensure that enset products are of consistent quality, meet international food safety standards, and can be stored and transported effectively.

In addition to improving post-harvest practices, efforts to enhance the marketing and branding of enset-based products will be crucial to boosting their marketability. Currently, there is a lack of awareness and understanding of enset's nutritional and health benefits outside of Ethiopia, particularly in international markets. Enset's rich nutritional profile, including high levels of starch, fiber, potassium, calcium, and iron, positions it as a potential superfood in global markets. Its gluten-free nature, combined with its versatility as a base ingredient in various food products, makes it an attractive option for the growing demand for plant-based and health-conscious foods. Developing effective marketing strategies, branding, and product packaging will be essential for gaining traction in both domestic and international markets. Additionally, the establishment of partnerships with international food distributors and retail chains could provide the necessary infrastructure to expand enset's reach beyond Ethiopia.

Furthermore, enset's role in the local economy extends beyond its food and medicinal uses. It provides a source of income for farmers and contributes to the livelihoods of millions of Ethiopians, particularly in rural areas. With increased commercialization of enset-based products, smallholder farmers could benefit from higher demand, better prices, and the expansion of local processing industries. This, in turn, could enhance rural development, reduce poverty, and improve food security across the country. Expanding the market for enset products could also provide new opportunities for women, who are primarily responsible for enset cultivation, processing, and marketing. By empowering women with access to better tools, technologies, and training in post-harvest handling and marketing, enset commercialization could support gender equality and foster more inclusive economic growth.

Post-Harvest Handling of Enset Products

The post-harvest process of enset is critical in determining the quality of its derived products. Traditional post-harvest handling practices have been in place for centuries, with methods passed down through generations. However, these methods often fall short in terms of maximizing the product's marketability. The handling process includes harvesting, cleaning, fermentation, drying, and storage. Each of these steps significantly influences the final quality and value of enset products.

- **Harvesting and Preparation:** Enset is harvested when the plant reaches maturity, which typically takes between 4 to 7 years, depending on the landrace and

environmental conditions. The corm and pseudostem are the primary edible parts of the plant, with the corm being used for fermentation to make *kocho* and *bulla*. However, improper harvesting practices, such as early or late harvesting, can lead to a reduction in yield and quality.

In many enset-producing regions, farmers rely on rudimentary tools and methods to harvest the plants. For instance, studies by Tefera et al. (2019) ^[1] show that smallholder farmers in the Southern Nations, Nationalities, and Peoples' Region (SNNPR) often use hand tools to cut the plant and remove the corm. This manual process, while traditional, can result in damaged corms that may not be suitable for high-quality products. Adopting more efficient harvesting techniques could reduce losses and enhance the quality of enset products for the market.

- **Fermentation Process:** The fermentation process is one of the most critical stages in determining the marketability of enset products. For products like *kocho* (fermented corm), the corm is placed in pits and fermented for several weeks. The fermentation process not only enhances the flavor and nutritional content of enset products but also extends their shelf life. However, traditional fermentation methods are often inconsistent, leading to variability in quality and taste. Fermentation pits are frequently exposed to environmental factors, such as weather and pests, which can compromise the final product's quality.

A study by Hunduma & Ashenafi (2011) highlights the need for better fermentation technologies to standardize the process and ensure higher-quality, consistent products. Modernizing the fermentation process, such as through the introduction of controlled fermentation units or improved storage techniques, could improve product quality, increase shelf life, and meet international food safety standards, thus enhancing marketability.

- **Drying and Storage:** After fermentation, enset products such as *kocho* are often dried to preserve them for long-term storage. In rural areas, drying is typically done through sun-drying, which can result in uneven drying and potential contamination by dirt, insects, or moisture. Proper drying techniques are essential to maintaining the nutritional value and flavor of the product.

To improve the quality of dried enset products, more controlled drying methods should be considered, such as using solar dryers or mechanical dryers. These systems can help reduce the risk of contamination, maintain the product's nutritional profile, and extend shelf life, making enset products more marketable and export-ready. As reported by Woldesenbet et al. (2022), improving drying techniques could also increase the overall yield of processed enset products, helping meet growing market demand.

Marketability and Export Potential of Enset Products

- **Domestic Market Demand:** The demand for enset-based products within Ethiopia is substantial, especially in regions where enset is the primary food source. However, despite its importance, enset products are still predominantly consumed locally, with limited market penetration outside enset-producing regions. The

increasing urbanization of Ethiopia's population, along with changing dietary habits, offers significant opportunities for the commercialization of enset products in urban markets. Expanding access to enset-based foods, especially through supermarkets and food processing outlets, could drive domestic market growth. Enset products such as *kocho* and *bulla* have gained popularity among Ethiopians living abroad, particularly in countries with significant Ethiopian diaspora populations. This presents an untapped opportunity to expand enset product markets internationally. Developing strategies for marketing enset-based products, such as branding and packaging improvements, could make these products more appealing to urban consumers and expatriates.

- **Export Potential:** The international market for enset products is relatively untapped, yet it presents considerable opportunities. Enset is rich in starch, fiber, and micronutrients, and its potential as a gluten-free, nutritious alternative to other carbohydrate sources such as wheat and rice is increasingly being recognized. This could appeal to the growing health-conscious consumer base worldwide, particularly in the context of rising interest in plant-based diets and gluten-free foods.

Despite these advantages, several challenges hinder the export potential of enset products. One of the main obstacles is the lack of standardized processing methods, which leads to inconsistent product quality. Furthermore, the absence of certifications such as Organic or Fair Trade labels, which are crucial in international markets, limits the appeal of enset products. In addition, the limited capacity for large-scale production and processing makes it difficult to meet the demands of international markets.

To overcome these challenges, it is essential to invest in modern processing technologies, improve post-harvest handling practices, and obtain relevant certifications. These improvements will not only ensure that enset products meet international quality standards but also enhance the competitiveness of Ethiopian enset products in the global marketplace.

- **Opportunities for Value-Added Products:** Another significant opportunity lies in developing value-added products from enset. Instead of solely focusing on basic products like *kocho* and *bulla*, Ethiopia could capitalize on the global trend of functional foods by creating health-focused enset-based products such as snacks, flours, and beverages. These products, fortified with additional vitamins and minerals or marketed as gluten-free, could attract the growing health-conscious consumer market worldwide.

For example, enset flour can be marketed as a gluten-free, nutrient-dense alternative for baking. Enset-based energy bars or ready-to-eat meals could be developed for both local and international markets. Furthermore, products derived from enset fibers, which are used in textiles and crafts, could be marketed as eco-friendly and sustainable alternatives to synthetic materials.

Conclusion

Enset has significant potential to become a key player in both the domestic and international markets. However, unlocking its marketability requires improvements in post-harvest handling practices, including better fermentation,

drying, and storage techniques. The development of standardized processing methods will help ensure consistent quality, extend shelf life, and meet international food safety standards. Additionally, creating value-added products, such as enset flour or energy bars, could further enhance its marketability and appeal to health-conscious consumers worldwide.

The export potential of enset-based products is considerable, especially in light of the growing global demand for gluten-free and plant-based foods. To fully capitalize on this opportunity, it is crucial for Ethiopia to invest in modern processing technologies, branding, packaging, and certifications. With strategic efforts to address current challenges and maximize opportunities, enset could emerge as an important agricultural export for Ethiopia, contributing to economic growth, improved food security, and enhanced livelihoods for smallholder farmers.

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