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The role of the Tambi Tea Plantation Industry in the local economy in the Wonosobo Region

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ARTICLE HISTORY
Received October 21, 2023. Accepted December 07, 2023. DOI:10.55942/ccdj.v3i2.322

ABSTRACT
This research aims to analyze the role of the Tambi tea plantation industry in the local economy of the Wonosobo region. A descriptive approach was used, collecting data from various primary and secondary sources such as interviews, historical documentation, and related literature. Research instruments included interview guides and observation sheets. Data analysis methods used were content analysis and descriptive statistics. Data validity was checked through data triangulation, comparing and verifying data from various sources to ensure consistency and reliability. The results showed that the Tambi tea plantation industry has played an important role in enhancing the local economy in the Wonosobo region. This research faced limitations in access due to certain areas being restricted for visitors. Limited time also constrained the depth of analysis and the number of samples that could be studied, as well as the number of respondents for interviews. The historical development of this industry also illustrates significant social and economic changes in the local community. This research provides valuable insights for local stakeholders, the plantation industry, and researchers in the fields of economics and local development.

KEYWORDS
Plantation Industry; Tambi Tea; Employment; Local Economy

1. INTRODUCTION

The tea plantation industry plays a crucial role in the local economy of the Wonosobo region, Central Java. Among the various tea plantations, the Tambi Tea Plantation stands out as one of the main contributors to local economic growth. This background motivates the research to better understand the impact and role of this industry in the local economic context. Wonosobo, a district located in Central Java Province, is known as one of the largest tea-producing areas in Indonesia. Tea plantations have been the backbone of the local economy for years, providing employment for thousands of farmers and supporting other economic activities. Despite its significant impact, there has been limited research specifically exploring the role of the Tambi Tea Plantation industry in the local economy (Santoso et al., 2022; Widyanty et al., 2024). This study aims to fill this knowledge gap by analyzing in more detail how the Tambi Tea Plantation industry contributes to the local economy in the Wonosobo region. In this context,

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the discussion of the research problem will cover several aspects, including job creation, farmer income, infrastructure development, and the potential of this industry as a driver of local tourism (Fahlevi, 2023; Kuldasheva, Ahmad, Salahodjaev, & Fahlevi, 2023).

The motivation behind this research is to provide a more comprehensive understanding of the role of the Tambi Tea Plantation industry in supporting local economic growth. It is hoped that the results of this research can provide valuable insights for policymakers, industry players, and the general public to better understand the potential and challenges faced by the Tambi Tea Plantation industry in the local economic context of the Wonosobo region. The economic impact of the Tambi Tea Plantation Industry cannot be underestimated. In addition to providing employment for thousands of local workers (Habiburrahman et al., 2022), the Tambi Tea Plantation Industry also makes a significant contribution to the creation of economic value in the surrounding area through wage payments, the purchase of local raw materials, and various community development programs implemented by the company (Prasetyo, Putri Harwijayanti, et al., 2022).

Despite the impressive achievements of the Tambi Tea Plantation Industry, it continues to face various challenges and opportunities in the future. One of the main challenges is dealing with increasingly fierce global competition, both in terms of price and quality. Additionally, climate change and other environmental factors can potentially affect the productivity and quality of the tea produced. On the other hand, there are also various opportunities that the Tambi Tea Plantation Industry can leverage to continue to grow and innovate. For example, opportunities to enhance marketing and market penetration, product diversification, and the application of new technologies in the production process (Ahmad, Kuldasheva, Nasriddinov, Balbaa, & Fahlevi, 2023; Fahlevi & Alharbi, 2021). Overall, the Tambi Tea Plantation is a real example of how a company in the agricultural sector can survive and thrive amid complex challenges. With good management and the right strategies, it is hoped that the Tambi Tea Plantation Industry can continue to be one of the leading tea producers that have a positive impact on the economy and the surrounding community (Marhaeni et al., 2023).

2. LITERATURE REVIEW

The tea plantation industry is one of the agricultural sectors that plays an important role in the local economy in many regions in Indonesia. Previous research has provided valuable insights into the role of this industry in supporting economic growth and regional development (Prasetyo, Gartika, et al., 2022). In this context, several studies have identified key aspects related to the tea plantation industry and its impact on the local economy. One aspect that is often studied is the impact of the tea plantation industry on job creation in the surrounding area. Research by Marhaeni, Sudibia, Andika, and Fahlevi (2024) shows that the tea plantation industry can provide employment for local residents, both directly and indirectly, which has a positive impact on unemployment rates and community welfare.

Additionally, research by Altieri and Nicholls (2017) highlights the important role of the tea plantation industry in increasing farmer incomes in the area. The results of this research show that tea farmers earn significant income from their harvests, which in turn contributes to the improvement of purchasing power and economic welfare of the local community. However, despite the many studies that have been conducted on the tea plantation industry, there is still a knowledge gap regarding the specific role of the

Tambi Tea Plantation industry in the local economy of the Wonosobo region. Further research is needed to better understand the direct and indirect impact of the Tambi Tea Plantation industry on the local economy, including factors such as infrastructure development, tourism potential, and economic diversification. Based on this literature review, the research hypothesis is that the Tambi Tea Plantation industry has a significant positive impact on the local economy in the Wonosobo region, including in terms of job creation, farmer income enhancement, infrastructure development, and tourism potential improvement.

3. RESEARCH METHODOLOGY

This research uses a descriptive qualitative approach to analyze the role of the Tambi Tea Plantation industry in the local economy of the Wonosobo region. This method is chosen to gain an in-depth understanding (Fahlevi, Moeljadi, Aisjah, & Djazuli, 2022; Yusuf et al., 2024) of the contribution of the Tambi Tea Plantation industry to the local economy.

3.1. Data Collection

Both primary and secondary data will be collected (Burns & Burns, 2008; Lind, Marchal, & Wathen, 2018; Saunders, Lewis, & Thornhill, 2009; Sekaran & Bougie, 2016). Primary data includes interviews with tea farmers, plantation managers, and local government officials. Secondary data will be obtained from government reports, academic journals, and industry publications.

3.2. Data Analysis

Data will be analyzed using a qualitative approach. The analysis will focus on identifying the role of the Tambi Tea Plantation industry in job creation, farmer income enhancement, infrastructure development, and tourism potential.

3.3. Data Validity

To ensure data validity, data triangulation will be conducted by comparing and verifying information from various sources (Gaskin, 2013).

3.4. Instruments and Software

Interviews will be conducted directly using pre-prepared interview guides. Qualitative data analysis will be performed using NVivo software to organize, categorize, and analyze data systematically (Braun & Clarke, 2006).

3.5. Research Assumptions

This research assumes that the Tambi Tea Plantation industry has a significant impact on the local economy in the Wonosobo region and that the data collected through interviews and field observations can be relied upon to represent the actual conditions.

Thus, this research is expected to provide a clearer picture of the role of the Tambi Tea Plantation industry in the local economy of the Wonosobo region and provide recommendations to enhance the contribution of the Tambi Tea Plantation industry to the local economy. Supporting theories used include regional economic theory, agricultural theory, and local economic development theory. This research is not an experimental or model-based simulation study but rather a field study that relies on empirical data and qualitative analysis. By using this method, this research is expected to provide an in-depth understanding of the role of the Tambi Tea Plantation industry in the local economy of the Wonosobo region.

4. RESULTS AND DISCUSSION

4.1. Geographical Location of the Tambi Tea Plantation

PT Perkebunan Tambi has three tea plantations located on the slopes of Mount Sindoro and Sumbing, with tea planting areas ranging from 800 to 1995 meters above sea level. The average annual rainfall ranges between 2500 and 3500 mm. These three plantations are Bedakah, Tambi, and Tanjungsari, along with the main office. The total area of UP Tambi is 273.17 hectares, which includes 247.55 hectares of tea plantations, 1.66 hectares of factories, 11.29 hectares of housing, 7.84 hectares of roads, 2.25 hectares of gullies or ravines, 0.69 hectares of fields, and 1.89 hectares of agro-tourism (Kurniawan et al., 2018).

This plantation unit is located in the village of Tambi and its surroundings, Kejajar District, north of Wonosobo City, approximately 14 kilometers from the city, not far from the Wonosobo - Dieng Plateau highway. The total area is 261.4769 hectares, consisting of 260.0309 hectares of HGU (Hak Guna Usaha) and 1.4460 hectares of HGB (Hak Guna Bangunan). The land is located on the northwest slopes of Mount Sindoro, at an altitude of 1250 - 2000 meters above sea level. The average annual rainfall is 3000 - 3500 mm, with temperatures ranging from 10 to 23°C and humidity between 70 and 90 percent. The soil types are generally andosol and latosol. Tambi Plantation consists of four blocks: Taman, Pemandangan, Panama, and Tanah Hijau.

The boundaries of the Tambi Plantation Unit are as follows: north - Desa Tambi, Kejajar, Perhutani; east - Dusun Sikatok, Desa Canggal, Perhutani Forest; south - Desa Jengkol, T Logo, Perhutani Forest; and west - Desa Maron, Perhutani Forest. The topography of the land in UP Tambi is undulating to hilly, with elevations ranging from 1200 to 2100 meters above sea level. Data from UP Tambi in 2005 shows an average monthly rainfall of 260.9 mm (Prastiwi and Lontoh, 2019).

4.2. Development of Tea Plantations in Wonosobo Before Indonesian Independence

4.2.1. Tea Plantation Development in Wonosobo During the Dutch Colonial Era

The initial cultivation of tea plants in Wonosobo Regency during the Dutch colonial period did not achieve optimal production results. This was due to many difficulties in the early stages of tea cultivation, such as a lack of knowledge in tea farming. The efforts of the Dutch colonial government were not successful as the quality of the production was still poor, and production costs were high. In 1839, the cost to produce 0.5 kg of tea was f. 1.17, while the selling price in Amsterdam was f. 0.81 for the same quantity.

Consequently, the Dutch colonial government suffered significant losses from 1835 to 1840, amounting to around f. 300,000. By 1946, losses had increased to f. 500,000, and by 1860, they were approximately f. 6,000,000.

Due to continuous losses, the Dutch colonial government gradually stopped tea cultivation on the advice of the Minister of Colonies. Many tea plantations were closed and leased to private parties. In 1864, government-owned plantations in the Bagelen area (Wonosobo) were leased to D Van der Sluij for the Tanjungsari plantation unit and W de Jong for the Tambi and Bedakah plantation units. The sales agreement was executed at the Bagelen Resident's office on Tuesday, December 20, 1864. D Van der Sluijs had to pay f. 42.25 per bau (an area measurement) for a total of f. 7.338,80, while W de Jong had to pay f. 32.50 and f. 45.50 per bau, totaling f. 15.403,65. The annual lease payment for the three plantations was f. 22.741,75. In March 1865, the plantations in the Bagelen area, Wonosobo, were named "Ledokache Theetuinen" and leased to D Van der Sluij and W de Jong. These plantations were later bought by Mr. MP Van Den Berg, AW Hoile, and Ed Yacobson, who established "Bagelen Thee & Kina Maatschaappij."

Leased lands were converted to erfpacht (long-term leasehold) in 1870 following the enactment of the Agrarisch Wet or Agrarian Law for 75 years. The management of Bagelen Thee & Tina Maatschaappij was handed over to John Peet & Co, based in Jakarta. John Peet had knowledge of tea processing requirements and methods, which he eventually shared with other tea entrepreneurs in Java. Assam tea from India was introduced in 1872 because it thrived well and was more durable. Gradually, Assam tea began replacing the existing Chinese and Japanese tea plants.

The condition of plantations in the Bagelen Residency at that time was far from ideal, appearing poor and neglected, in stark contrast to the plantations in Cikajang, Garut, West Java. While the cultivation and processing of tea in Cikajang and Bagelen were similar, tea from Cikajang fetched higher prices in Amsterdam. Consequently, the Cikajang tea plantations were profitable, whereas the Bagelen tea plantations incurred losses. This disparity was due to low tea production in Bagelen and higher production costs.

In 1879, JILL Jacobson introduced rolling machines, which positively impacted tea processing. This improvement, along with the introduction of Assam tea from India, led to better tea leaf picking practices and the formation of small groups led by supervisors. Eventually, tea production and quality improved, allowing it to compete in the global market. As a result, W.P. Bakhoven was appointed chief administrator of the Bagelen tea plantations in Wonosobo.

As tea cultivation techniques improved and the tea market expanded, the overproduction of tea led to a drop in prices. To address this, in 1932, an agreement was reached between tea producers from India, Sri Lanka, and Indonesia to impose production and export restrictions on February 9, 1933. This agreement aimed to stabilize tea prices in the global market. Under the agreement, Bagelen Thee & Tina Maatschaappij could only export 80% of its total production, with the remaining 20% used as fertilizer or burned.

4.2.2. Tea Plantation Development in Wonosobo During the Japanese Occupation

During the Japanese occupation, many changes occurred in the tea plantations and local life. Generally, tea plants were not well-maintained, with many replaced by other crops such as pyrethrum, cassava, sweet potatoes, bananas, corn, wheat, castor oil plants, konjac, and other food crops. In 1943, an SKK decision mandated the transfer

of 30 tea plantation companies to textile companies to cultivate ramie (Boehmeria nivea) for making sacks. Employees received small rice rations of 10 kg per person per month, later replaced by corn and cassava. Daily laborers were given bran and corn rations.

The dismantling of tea plants led to former tea plantation lands being occupied by local residents. People eager for land control invaded the tea plantations. In Bedakah Afdeeling, the tea plantations in Kledung Village were cleared and taken over by residents. Similarly, tea plantation lands in Reco Village, Pagerotan Village, and near Bukit Surodilogo were occupied by local communities. Some tea bushes survived and regrew in Bedakah and Jurang Jero plantations. Tea plantations in Kaliurip, Penjor, and Mount Kembang remained intact due to their mountainous locations.

In Tanjungsari Afdeeling, most of the area east of the road remained intact and under Bagelen Thee & Kina Maatschaappij's control. The Tanjungsari emplacements were used as prisons by the Japanese government to house criminals forced to plant food crops and other required plants. In contrast, the Tambi Afdeeling had fewer changes. Although many tea plants were cleared, no land was occupied by the public. The tea plantations in Tlogo, such as Kreo, Serengsari, Tambi, and Sikatok, remained under Bagelen Thee & Kina Maatschaappij's control, except for the Sikatok plantation, which was converted to pyrethrum cultivation.

The development of the Tanjungsari unit was different. From the arrival of the Japanese army in 1942 until the end of their rule, the factory and plantations served as prisons. In 1948, the Tanjungsari plantation was returned from the prison service to the plantation company. The Tanjungsari Plantation Unit was led by Tanaka and Murrata, assisted by Indonesian assistants Koesnadi, Soetardi, and R. Soekardi. Only a small portion of the tea plants were replaced with food crops.

4.2.3. Development of Tea Plantations in Wonosobo After Indonesian Independence

Before the outbreak of World War II, Indonesia ranked third in the world for tea exports. The tea exported was produced by large company-owned estates, smallholder farmers, and small government plantations. Black tea was the primary export commodity from large company-owned plantations in Indonesia, while green tea from smallholder plantations was mostly marketed domestically. Most tea plantations in Indonesia were still owned by Dutch companies headquartered in Amsterdam or Rotterdam, and their marketing was done through auctions in these cities.

After Indonesia gained independence, many aspects needed improvement, especially in the plantation sector. The damage to plantations caused by World War II had a significant impact, and the focus on exports and dependence on the global market led to a decline in plantation production. This also affected the tea plantations in Wonosobo, which lost their export markets.

This situation was exacerbated by the physical revolution, including the First Military Aggression in 1947 and the Second Military Aggression in 1958. Such conditions were very unfavorable for plantations, particularly tea plantations in Wonosobo, leading to a decline in tea production. After the physical revolution ended, the Republic of Indonesia had to face an unfavorable economic situation, such as inheriting a federal budget with a large deficit, strong inflation tendencies, and an imbalance between exports and imports. This was due to the slow recovery process of the plantations, and during the war, Indonesia had lost much of its market before the war. The decline in production supported the need to catch up or restore the global market.

In 1950, the Indonesian government faced the challenge of reactivating existing plan-

tations to generate state revenue, reorganize land and labor issues, and attract capital investment in plantation companies. The government's efforts to restore plantations were based on several factors:

- Repairing the damage suffered by plantations, especially regarding capital and equipment
- Preparing capital to operate heavily damaged plantations
- Analyzing plantation land that had been used by local residents for food crops
- Preparing compensation demanded by managing bodies or organizations
- Minimizing theft or fraud by local residents that could disrupt plantation operations
- Reclaiming land occupied by local residents illegally

Indonesian independence on August 17, 1945, had a significant impact on the development of tea plantations in Indonesia, especially those in Wonosobo. The tea plantations in Wonosobo, initially owned by foreign companies under the name Bagelen Thee & Kina Maatschaappij, were taken over by the Indonesian government. These plantations comprised three units: Tambi, Bedakah, and Tanjungsari. The National Plantation Center (PPN), headquartered in Surakarta, managed these units. Workers were employed as state plantation employees with a representative office in Magelang.

In 1949, the Round Table Conference (KMB) was held in The Hague with the agenda of transferring authority from the Dutch government to the Indonesian government. Dutch soldiers still in Indonesia were withdrawn and repatriated, creating a truly safe situation. In line with the KMB agreement, all Dutch-owned companies were returned to their original owners, including the Tambi, Bedakah, and Tanjungsari tea plantations, which were returned to Bagelen Thee & Kina.

Another impact of the KMB agreement was the deactivation of all PPN employees by the Minister of Prosperity, leading to the formation of a group of former PPN employees. These former employees established the Mountain Plantation Office, headquartered at Hotel Merdeka Wonosobo. They began to operate the plantations again according to their abilities, even though the original plantation owners in the Netherlands had not yet returned to inspect their companies in Indonesia. The former PPN employees utilized the plantations as they had been doing and took steps to make them operational again.

4.2.4. Development of Tambi Tea Plantation in Bedakah Village, Kertek District, Wonosobo Regency (1957-1998)

The development of PT Tambi UP Bedakah, particularly in black tea production, experienced many changes from 1957 to 1998. In 1957, black tea processing relied on manual labor, involving sun drying fresh shoots, manual rolling, and pan drying. The second phase saw changes in the rolling process with simple tools. By 1998, the third phase involved comprehensive changes in black tea processing, including the withering process using Withering Troughs, rolling with Beatten-equipped tools, Rotorvane use, and drying with Endless Chain Pressure (ECP) dryers. Changes aimed to reduce labor costs and increase productivity and production output. The withering process shifted from diesel to wood fuel to cut costs. Rolling employed Open Top Rollers (OTR) with Rotary Roll Broker (RRB) and Rotorvane (RV), drying used dryers along with Cluster, Bubble, Tray, Vibro, and Chota, while packing used sacks and paper bags. These changes were not only in labor substitution by machines but also in human resource quality management (PT. Tambi Archives, 2010).

The global economic crisis in 1998 halted or delayed many Indonesian export orders. However, the prices of some Indonesian export products rose. One effort to cope was replacing oil with wood as fuel (interview with Mr. Megi).

Tea production at PT Tambi from 1957 was 2658 kg/Ha. In 1962, production declined to 1732 kg/Ha, slightly increasing to 2150 kg/Ha in 1967. By 1972, production rose to 2777 kg/Ha, decreased to 2388 kg/Ha in 1977, and rose to 2723 kg/Ha in 1982. It reached 2759 kg/Ha in 1987, 2833 kg/Ha in 1992, and a high of 2900 kg/Ha in 1997. However, the global crisis in 1998 led to a drop to 1720 kg/Ha (Tambi tea production data). Tea production from 1957-1998 at PT Tambi is shown in the following table:

Table 1. Tea production from 1957-1998 at PT Tambi

Year	Production (kg/Ha)
1957	2658
1962	1732
1967	2150
1972	2777
1977	2388
1982	2723
1987	2759
1992	2833
1997	2900
1998	1720

Source: (PT Tambi Archives)

4.3. Raw Material Procurement

Processing fresh tea shoots into the desired dry tea requires a specific processing system. PT Tambi uses the Orthodox Rotorvane system for black tea processing, which involves breaking down leaf cells to allow a reaction between polyphenol compounds in tea, latex, polyphenol oxidase, and oxygen. This reaction determines the quality of black tea (Niles, Horner, Chintala, & Tricarico, 2019).

4.4. Production Process

The stages of black tea processing at PT Tambi include fresh tea shoot reception, withering, rolling or crushing (wet sorting), enzymatic oxidation, drying, dry sorting, packaging, and storage (PT Tambi Archives, 2006). Black tea processing involves the following key phases:

4.4.1. Withering

The initial process crucial for converting fresh tea shoots into dry tea. Withering softens or wilts the fresh tea leaves by gradually evaporating some of the water. This process involves chemical changes in the plant's metabolic compounds within the leaf cells and physical changes as the water content decreases, making the leaves more flexible.

- Fresh shoot reception
- Spreading out the shoots
- Fresh air supply
- Hot air supply
- Turning

- Wilting completion
- Weighing wilted shoots
- Rolling preparation

4.4.2. Rolling or Crushing

Aims to create the best physical conditions for the encounter between polyphenol oxidase enzymes and polyphenols. Rolling, an evolution from manual rolling, crushes and rolls wilted tea leaves into smaller particles.

- Breaking cells for polyphenol and oxidase enzyme interaction
- Physically rolling, crushing, and curling to reduce the tea leaves to smaller particles

4.4.3. Enzymatic Oxidation

The reaction of substances with oxygen, facilitated by enzymes. Factors affecting enzymatic oxidation include:

- Particle size
- Temperature and humidity
- Bed thickness
- Oxidation time
- Dust temperature

4.4.4. Drying

Reducing water content in the material to a specific level through treatment, involving the evaporation of water from the material's surface via diffusion due to heat energy.

4.4.5. Dry Sorting

Sorting dried tea and packing it after the sorting stage, the final step in black tea processing. Tea is sorted into various quality grades and sizes.

4.4.6. Packaging and Storage

Using materials to protect and preserve product quality during transportation and storage. Tea packaging and storage ensure the quality of dried tea is maintained

4.5. Factors Influencing the Development of Tambi Tea

The main objective of a company, besides meeting human needs, is to achieve a reasonable profit. With adequate profits, a company can sustain its operations and potentially expand its business. To achieve this, companies must strive to produce high-quality goods and services at relatively low prices. Effective cost management is essential for this to be achieved. Manufacturing companies classify costs into three main categories: production costs, marketing costs, and administrative and general costs. From this cost classification, it is clear that the calculation of production costs is crucial in realizing the company's goals. In product manufacturing, costs are divided into production and non-production costs (Saniuk, Grabowska, & Fahlevi, 2023). Production costs form the

basis of calculating the cost of finished goods, while non-production costs are added to the production cost to determine the total cost of goods. Accurate information and collection of production costs are critical in determining the correct cost of production. Correct cost calculation also affects the setting of the selling price, ensuring it is neither too high nor too low compared to the production cost, thereby achieving the expected profit. Incorrect cost calculation can lead to pricing issues, potentially resulting in a lack of profit or even losses, and misleading management decisions. This greatly influences the company's development. Over the years, Tambi plantation has experienced development influenced by several factors, including:

4.5.1. Global Market Demand

The global market demand for tea was very high at the time, making tea a prized plantation commodity due to its high market price. A country's tea competitiveness can be analyzed from its tea export growth performance. Indonesia's tea export growth lagged behind global growth. To increase tea production, producers must contribute effectively. Several tea-exporting countries had high competitiveness (Suprihartini, 2001).

4.5.2. Favorable Domestic Conditions

Good domestic conditions facilitated easy trade routes.

4.5.3. Effective Marketing Management

The company's marketing management successfully promoted its products, allowing tea production initially marketed locally to be exported nationally and internationally by 1970.

4.5.4. Efficient Production and Distribution Management

Management effectively handled production and distribution systems.

4.5.5. Weather and Climate

Weather and climate play significant roles in determining tea quality and quantity (Interview with Mr. Pamuji, June 26, 2010).

4.6. Efforts by PT Tambi to Increase Production

In an era of global trade, tea producers face intense competition from other global producers. Increasing competition intensity and the number of competitors require producers to meet consumer needs more satisfactorily than their competitors. Therefore, consistent quality standards across countries become an unavoidable necessity. Hence, quality is a crucial factor for tea producers.

However, tea producers' focus is not limited to product quality but also includes process, human resources, and environmental aspects. The increasingly complex environment faced by producers requires high-quality standards to compete globally. International market competition can only be won by adaptive companies with a competitive edge in meeting consumer needs. The global market provides significant opportunities for tea producers and processors, such as Malabar Plantation, a unit of PT Perkebunan Nusantara VIII. The primary marketing goal is export, making quality management

crucial in facing global competition. Addressing quality management issues is a top priority (Muhamad Maulana, 1997).

Efforts to meet production targets include good and integrated garden management, such as pruning, pest and weed control, leaf fertilization, other maintenance, and adequate labor support. Processing at the factory focuses on quality according to consumer demand, while quantity depends on the garden's shoot production. Additionally, machinery maintenance is a priority due to technical inefficiencies. With periodic power outages from PLN, diesel fuel needs to be stockpiled. However, future wood fuel requirements also face challenges due to competition with other consumers, both factories and households, and limited supply, necessitating a three-month stockpile.

Other efforts by PT Tambi to increase production include workforce turnover, replacing non-productive workers with productive ones. New employee recruitment involves interviews and theory tests, with a minimum educational standard of junior high school. Unsuccessful candidates may intern for six months as temporary workers before retesting. If they fail the second test, they will no longer work at PT Tambi (Interview with Mr. Pamuji, June 26, 2010).

4.7. Challenges Faced by PT Tambi

Managing the quality of Tambi's black tea products is not without problems, including obstacles and challenges that affect efforts to optimize tea quality. Problems include declining quality and quantity of tea shoots and dry tea produced, and increased production and processing costs. The quantity and quality of tea shoots are crucial for producing dry tea that meets standards. Low-quality shoots result in less high-quality dry tea, reducing sales value. Low quantity means underutilized production capacity, increasing per-unit production and processing costs. Challenges faced by PT Tambi include:

4.8. Production Process Challenges

PT Perkebunan Tambi Wonosobo, an industry in black tea production, conducts mass or continuous production through several production departments. The production process results in three tea quality grades: Grade I, Grade II, and Grade III. The company does not differentiate production costs among these grades, treating the cost per unit of each grade as the same.

PT Perkebunan Tambi aggregates all monthly costs and allocates them to the month's production. However, cost aggregation lacks clear categorization, especially non-production costs, leading to non-production costs being included in production costs. This practice results in inaccurate production cost calculations, affecting pricing and profitability. Addressing inaccurate production costs requires categorizing costs according to company functions. Production costs are significantly influenced by raw material availability.

Tea raw material quality is affected by weather and climate. Poor weather and climate conditions result in suboptimal tea production, affecting quality and quantity. Other issues include leaf diseases like blister blight, which can damage leaves within hours, and inchworm infestations harming tea leaves.

4.9. Marketing Process Challenges

As Tambi plantation products are largely exported, prices align with unstable international market prices. Additionally, free markets disrupt sales results.

5. Conclusion

PT Perkebunan Tambi, established in 1865, was initially owned by the Dutch East Indies government and leased to private Dutch entrepreneurs D. Vanderships (for UP Tanjungsari) and WD Jong (for UP Tambi and Bedakah). In 1980, Mr. M.P. Van Den Berg, A.W. Holle, and Ed. Jacobson bought the plantations and established Bagelen Thee en Kina Maatschappij in Wonosobo, managed by John Peet and Co, Jakarta. During the Japanese occupation in 1942, Bedakah, Tambi, and Tanjungsari plantations were taken over by the Japanese, with some tea plants replaced by other crops like pyrethrum and castor oil. After the August 17, 1945, proclamation, these plantations were taken over by the Republic of Indonesia, under the National Plantation Center (PPN) headquartered in Surakarta. Workers were employed as state plantation employees, with regional offices in Magelang, Central Java. The Round Table Conference in the Netherlands in November 1949 mandated the return of foreign-owned companies in Indonesia to their original owners, including Bagelen Thee en Kina Maatschappij. However, the original owners did not immediately reclaim the plantations. Former PPN employees established the Mountain Plantation Office on May 21, 1951. After several years, Mountain Plantation managed the three plantations and heard that Bagelen Thee en Kina Maatschappij no longer wished to continue operations due to the plantations' poor condition (due to the physical revolution between Indonesia and the Netherlands). Imam Soepeno, S.H, Deputy Head of the Central Java Plantation Service, facilitated the sale of the plantations to former PPN employees, forming the PT NV ex PPN Sindoro Sumbing on May 17, 1954. The sale agreement between NV Bagelen Thee en Kina Maatschappij and PT NV ex PPN Sindoro Sumbing was finalized on November 26, 1954, officially transferring management of Bedakah, Tambi, and Tanjungsari plantations to PT NV ex PPN Sindor.

To facilitate coordination among plantation units and cooperation with company partners, the main office was built in downtown Wonosobo at Jalan Tumenggung Jogonegoro No. 39, with representative offices at each plantation unit having autonomous rights for plantation management. The establishment of PT Perkebunan Tambi in Wonosobo Regency has had a positive impact on the surrounding community, such as the residents of Sedayu Village. The Sedayu Village community benefits from employment opportunities in the Tanjungsari tea plantation, both as daily laborers and permanent employees, increasing their income. The presence of the tea plantation also helps preserve the local environment, maintaining soil fertility, securing water sources, and ensuring clean air and a cool climate. These environmental benefits positively impact the community's sustainability in Sedayu Village. The negative impact of PT Perkebunan Tambi on Sedayu Village residents is relatively small due to the good relationship between the company and the workers. Negative impacts in Sedayu Village are more related to community issues, such as criminal activities in the plantation area and the emergence of new social stratification. Criminal activities usually involve theft of ready-to-harvest tea leaves due to inadequate security. Increased income and welfare have led to higher consumerism, creating social class differences between upper-middle and lower-middle economic classes.

The research is constrained by the availability of historical data, which may be incomplete or difficult to access, affecting the depth of the analysis. Limited time and resources affected the research, preventing a thorough investigation of all aspects of the Tambi tea industry. Despite efforts to maintain objectivity, researcher subjectivity in data collection, analysis, and interpretation may not be entirely avoidable. The number and diversity of respondents may affect the representativeness of the research results. Efforts were made to obtain a representative sample, but data bias may still exist. Conducting a detailed study on the social and economic impact of the Tambi tea industry on the Tambi Village community, including further analysis of lifestyle changes, welfare, and community aspirations. Performing comparative analysis with tea industries in other regions or with other plantation industries in the same area to understand differences and similarities in their impacts. Designing a sustainable development model for the Tambi tea industry that balances economic, social, and environmental aspects. Conducting participatory research involving all stakeholders, including tea farmers, entrepreneurs, local government, and the community, to develop policies that support the inclusive and sustainable growth of the Tambi tea industry.

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