

## Development of Temanggung Robusta Coffee: Findings and Evidence from Central Java, Indonesia

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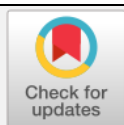
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### ABSTRACT

*Temanggung robusta coffee is a potential plantation commodity in Central Java that has existed since the colonial era. Its development has gone through various policies, both from the top down and bottom up. This research was based on empirical facts and phenomena on the development of Temanggung robusta coffee. The researchers conducted participatory observations, discussions, and in-depth interviews with 15 informants. Data analysis was done through a socio-historical and descriptive approach to accurately understand the evidence, history, and correlations between phenomena. This study's results prove that the transformation stage of Temanggung robusta coffee began in the era of forced cultivation of "Koffie Stelsel" through patron-client relationships. This development continues to experience socio-cultural shifts with a variety of different policies. Currently, three sectors are the main players in Temanggung robusta coffee (government, large private plantations, and the community). The factors causing the success of Temanggung coffee not to be achieved are 1) the large area of land but low productivity; 2) the process of randomly picking coffee; 3) policies that are not yet optimal; 4) minimal market share; 5) the capacity of extension agents in the coffee commodity is still low; 6) lack of cooperation between stakeholders.*

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## 1. Introduction

Coffee is one of the most popular drinks for consumers globally and one of the most traded commodities globally (Food & Agriculture Organization of the United Nations, 2021). The culture of drinking coffee has become a trend among young people (Gumulya & Helmi, 2017). In Indonesia, coffee is a commodity that makes a major contribution to the economy, increases the country's foreign exchange (Nugroho, 2014; Sahat et al., 2018), a source of income and welfare for farmers, creates jobs (Ihsaniyati et al., 2020), and for development region (Sitanggang & Sembiring, 2013). One of the well-known coffee-producing areas in Indonesia is in Temanggung Regency.

The coffee commodity in Temanggung Regency is a potential plantation commodity (Sumarjo et al., 2020) and is the main producer of coffee in Central Java (Risandewi, 2013). Coffee is the leading commodity in this district, including Robusta coffee (Lutfiyati et al., 2018). During the Dutch colonial era, Temanggung became the center of coffee plantations in Java. Evidence of this can be found in the legacy of large plantations since the colonial era, namely the Rowo Seneng Plantation and Redjodadi Ltd., often known as Took Bandung Plantation in Temanggung Regency. The community has cultivated robusta coffee in 19 sub-districts (Badan Pusat Statistik Kabupaten Temanggung, 2022). Since the independence era, Temanggung coffee has gone through various development policies, starting from the plantation nationalization policy, the Rejuvenation, Rehabilitation, and Export Plant Expansion Project in the 1990s, the coffee processing cluster in 2010, to the recognition of geographical indications in 2016. However, the current problem is why Temanggung Robusta coffee development is still difficult. The discussion on Temanggung robusta coffee through the policies carried out is fascinating to study. This study will describe the findings and evidence on the development of robusta coffee empirically in Temanggung Regency, Central Java Province.

## 2. Literature Review

### 2.1. Temanggung Coffee: Policies and Development

In line with efforts to develop Temanggung Robusta coffee, the government made various policies despite not producing maximum results. Dye (2013) defines policy as whatever governments choose to do or not to do. Policies intended to take advantage of existing strengths without exception to overcome obstacles to achieve the expected goals. One of the policy proposals for 2017 to 2022 includes a training policy and production equipment assistance for farmer groups. The presence of government assistance and policies is hoped to provide an opportunity for the community to enhance motivation (Tanjung et al., 2020) and boost production (Shodiq, 2022). However, policy planners' intentions, as outlined in planning, can sometimes not properly be implemented at the field level (Li, 2010).

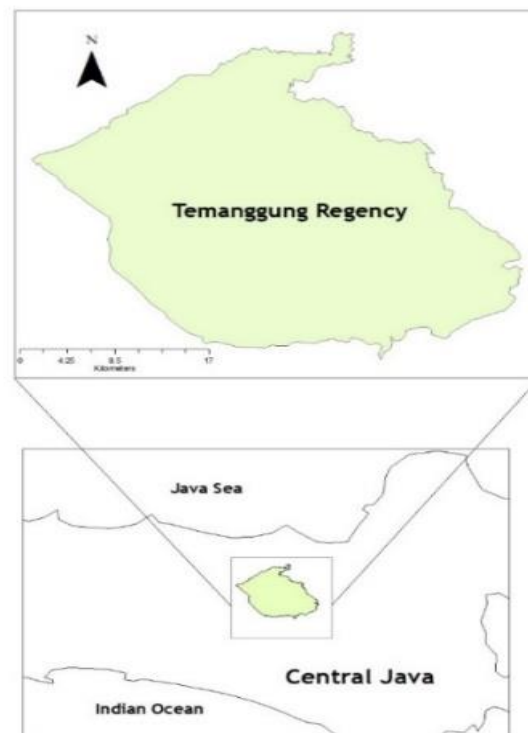
The practice of developing coffee in Temanggung is also inseparable from the social role of the community. Community development is a process of improving people's lives by paying attention to regional potential (Liliweri, 2014), natural resources, and the environment (Jacobs &

Baez Camargo, 2020), as well as humans (Thaman et al., 2016) from the Colonial era to the present era. Vasstrøm and Normann (2019) explained that the community as the target needs to be involved because interaction is required in the context of policy implementation so that it is more bottom-up. Ife and Tesoriero (2016) explain that community development can be carried out through sustainable policies, community participation, and a bottom-up approach.

### 3. Research Methodology

This research was based on empirical evidence concerning coffee development. The researchers conducted this study in Temanggung Regency, situated in the southwest region of the Capital City of Central Java Province (Figure 1). The researchers purposively determined this location by considering data that indicated Temanggung Regency as the largest Robusta coffee plantation in Central Java, covering 9,536.37 hectares (Ha), which accounted for 23.99% of the coffee plantation area in Central Java.

The researchers collected data by reviewing relevant documents aligned with the research objectives and conducting interviews and literature reviews.



**Figure 1. Location of Temanggung Regency**

Researchers conducted participatory observations by staying at the research location, conducting Focus Group Discussions (FGD), and carrying out in-depth interviews with fifteen key informants, as shown in Table 1. Recording, transcription, and writing of field notes were carried out. Expert discussions were conducted with key informants determined according to the field of study. Adding informants from community leaders is intended to discover the history of Temanggung coffee and the policies carried out at that time. The data collection technique was used to maintain the consistency and credibility of the data obtained.

Table 1. Informants in the Study

No	Informants	Areas Explored	Data Collection Techniques
1	Agriculture Office of Temanggung Regency (n=3)	Coffee development policies	In-depth interviews and FGD
2	Village Community Empowerment Service of Temanggung Regency (n=1)	Policies and participation	In-depth interview
3	Regional Government Planning Agency of Temanggung Regency (n=1)	Policies and participation	In-depth interviews and FGD
4	Cooperatives and Micro, Small and Medium Enterprises Office of Temanggung Regency (n=1)	Policies and participation	In-depth interviews and FGD
5	Industry and Labor Office of Temanggung Regency (n=1)	Policies and participation	In-depth interviews and FGD
6	Prima Jaya Cooperative (Coffee) (n=1)	Policies and participation	In-depth interviews and FGD
7	Redjodadi Ltd. (n=1)	Policies and participation	In-depth interviews and FGD
8	Naksatra Kejora Ltd. (n=1)	Policies and participation	In-depth interviews and FGD
9	Chairperson of the Community Group for the Protection of Geographical Indications for Temanggung Robusta Coffee (n=1)	Policies and participation	In-depth interviews and FGD
10	Coffee Farmers' Groups (n=5)	Participation and bottom-up approach	Observation, in-depth interviews
11	Gemawang Coffee School (n=1)	Bottom-up approach	In-depth interviews and FGD
12	Community Leaders (n=3)	Policies, participation, and history	In-depth interviews and FGD
13	Coffee Farmers (n=3)	Policies, participation, and history	In-depth interviews and FGD
14	Took Bandung Plantation Manager (n=1)	History	In-depth interviews and FGD
15	Rawa Seneng Plantation Manager (n=1)	History	In-depth interviews and FGD

Source: Analysis (2022)

Data related to policies that the local government has carried out to develop Robusta coffee in Temanggung is one of the data in the literature study. In addition, documents from farmer groups, the Community Group for the Protection of Geographical Indications for Temanggung

Robusta Coffee, the government, and other documents related to research studies to obtain more valid and comprehensive data. Data analysis is used through socio-historical and descriptive to accurately and systematically describe the evidence, characteristics, history, and correlation between the identified phenomena (Nazir, 1998). Adapted from Ismaun (2005), the method flow historically consists of 1) Heuristics, namely searching for and collecting historical sources by collecting phenomena facts both from old policy documents and through oral interviews; 2) Criticism, researchers evaluate and sort or filter the sources that have been obtained; 3) Interpretation, by looking for correlations between historical facts studied in the discussion; 4) Historiography, compiling research results on the development of coffee from each era so that a unified whole is obtained.

## 4. Results

### 4.1. Temanggung Robusta Coffee and Its History

Traces of the existence of Temanggung Robusta coffee have been going on since the Dutch colonial period, namely in the 17th century, which was brought by the Vereenigde Oostindische Compagnie (VOC) through its trade routes. The Netherlands has an important role in the development of Temanggung coffee. During the feudal era, the power relations between the community and the government were like masters and subordinates or patron-client relationships, which required the community to carry out forced cultivation "*koffie stelses*". Teo (2021) states that actors influence tendencies with their interests.

The Old Order era occurred after the "*koffie stelses*" policy impacted the socio-culture of the people of Temanggung. The patron-client relationship has shifted. People don't do forced labor in coffee plantations anymore. Therefore, growing communal plantations thrive. Temanggung has four models of development in managing coffee plantations. First, coffee plantations are managed by Indonesian State Plantations. Indonesian State Plantations oversees coffee plantations established by the Dutch government. For example, Redjodadi Ltd., or Took Bandung coffee plantation, is a coffee plantation inherited from the Netherlands. This plantation manages 128 hectares of coffee plants. Second, large private plantations. Like the Rowo Seneng Robusta coffee plantation, which Naksatra Kejora Ltd., a 137-hectare coffee plantation, manages. Rowo Seneng Plantations employs 100 employees. There is also CV Sidodadi, owned by indigenous people with a land area of 80-100 ha.



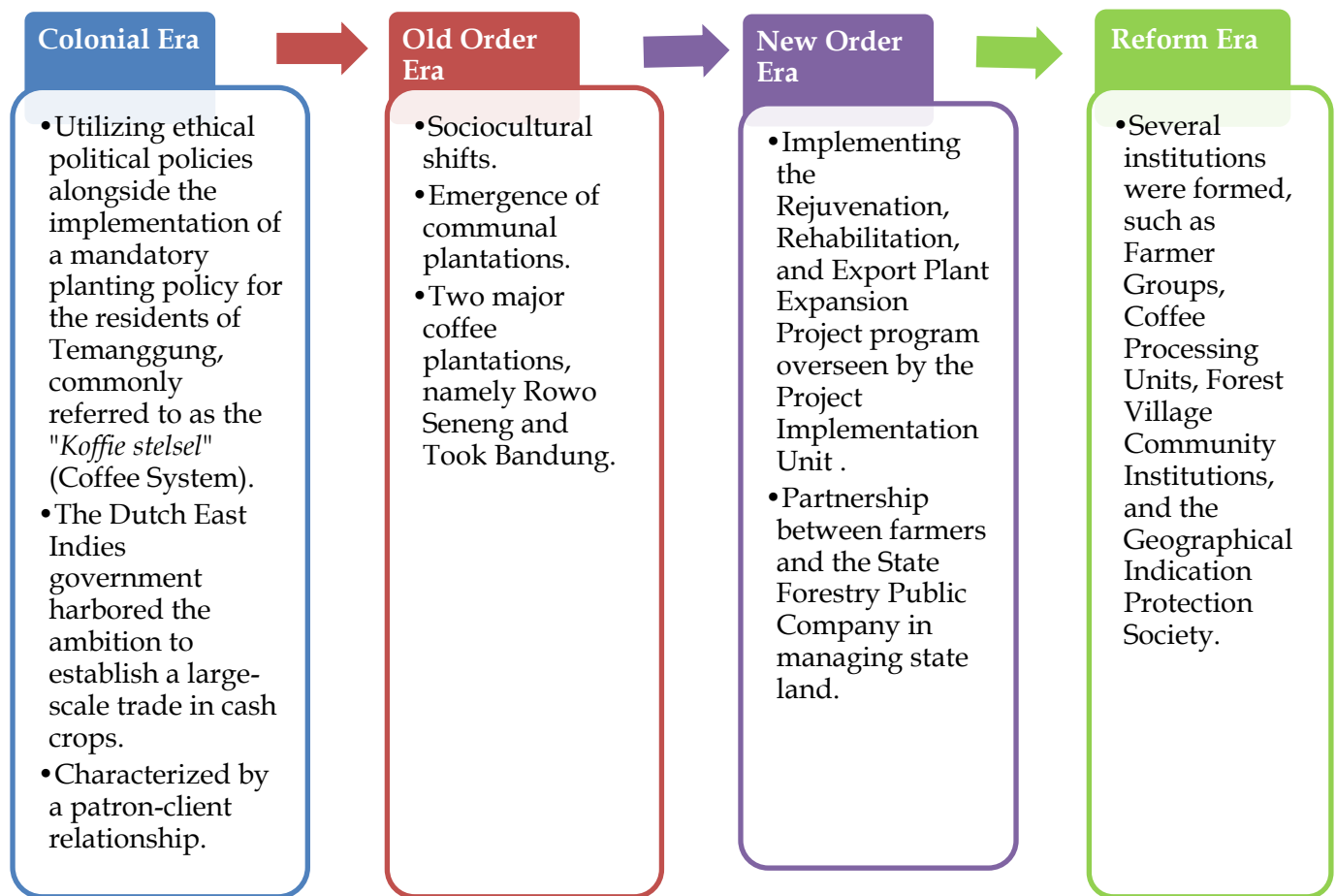


Figure 2. Flowchart of the History of Coffee Development in Temanggung Regency

Source: Primary and Secondary Analysis Data (2022)

Entering the New Order era of 1979-1999, the development of Temanggung Robusta coffee continued to transform. At this time, the government played quite an important role, including the Ministry of Agriculture having programs and activities of Rejuvenation, Rehabilitation, and Export Plant Expansion Projects in provinces and regions in Indonesia. The Rejuvenation, Rehabilitation, and Export Plant Expansion Project was proclaimed because it saw the condition of the people's estate crops, which were aged and old. Secondly, because they were old, it affected yield productivity. Thirdly, in 1979, the plantation was affected by a serious disease: leaf rust. These three components are what makes the government think that export crop production must be able to exist and survive. The interesting thing is why coffee sales during the New Order era did not fluctuate in price because they were sold in dollars instead of rupiah, so price changes continued to follow global prices. At that time, the term "tripartite" was known. The government, the private sector, and the judiciary had to work in balance. All needed each other and synergized. Those who provide financing are exporters. However, the Rejuvenation, Rehabilitation, and Export Plant Expansion Project program disbanded and was completed in 1999.

The era of reform became a period of very significant coffee development. The Central Government, Central Java Province, and Temanggung district currently manage the management of Temanggung robusta coffee. Activities include assisting farmers in cultivating and processing coffee products and cooperating with export companies through the Export

Plant Fund, soft funding with funding sources from exporters, or Corporate Social Responsibility (CSR).

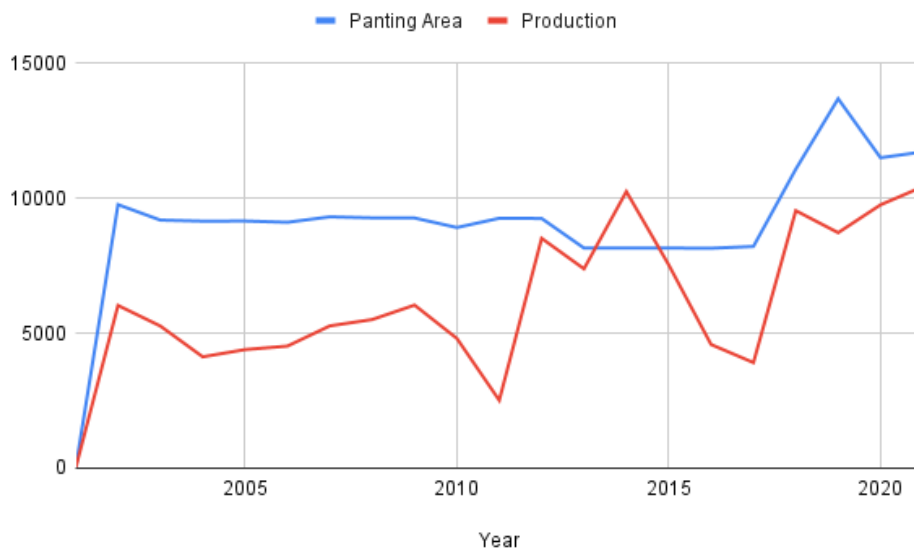


Figure 3. Area of Plantation vs Production (2001-2021)

The reform era occurred between 1998 and today. Based on the data collected, planted area and production correlate fairly closely. If the planted area increases, Robusta coffee production will also increase.

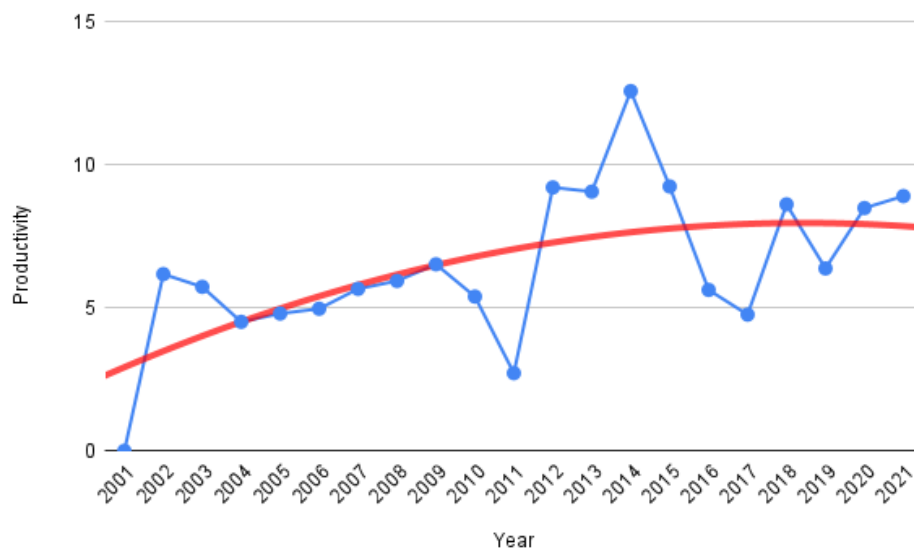


Figure 4. Temanggung Coffee Productivity (2001-2021)

From the productivity data, it can be seen that the curve has passed its peak. Temanggung Robusta coffee’s productivity will decline in the next few years if productivity is not increased.

#### 4.2. What Are the Local Government Policies?

Temanggung has an advantage in the coffee commodity, and this has an impact on local government policies. The Temanggung Regency Government, as a catalyst, continues to facilitate the implementation of coffee potential development with several designed policies

even though it's not running optimally. **Table 2** describes the policies that have developed from year to year.

**Table 2. Policies of the Temanggung Regency Government in Developing Coffee Potential**

Year	Policies
2001	<ul style="list-style-type: none"> <li>• Cloning Policy in Gardens (provision of robusta coffee seedlings).</li> <li>• Assistance of Integrated Pest Control Field School.</li> </ul>
2010	Temanggung Regency Government focuses on coffee processing clusters based on Temanggung Regent Decree Number 500/280/2010.
2015	<ul style="list-style-type: none"> <li>• Establishment of the Community Group for the Protection of Geographical Indications for Temanggung Robusta Coffee.</li> <li>• Issuance of a Geographical Indication Certificate by the Ministry of Law and Human Rights as a unique local intellectual property not possessed by others.</li> </ul>
2018	<ul style="list-style-type: none"> <li>• One-Day Coffee Drinking Movement in the Temanggung Regency Government.</li> <li>• Initiate post-harvest processing equipment assistance programs such as Pulper, Huller, Moister, Tester, and Roaster.</li> </ul>
2019	Issuance of Temanggung Regent Circular Letter Number 500/513/IX/2019 regarding Fridays as Coffee Drinking Day for the people of Temanggung.
2020	The government promotes coffee as a superior export product, facilitates training, study tours, and equipment assistance, and provides farmers with references for market access.
2021	Temanggung Robusta Coffee Red Picking Festival.
Present	<ul style="list-style-type: none"> <li>• Cultivation includes seedlings, good coffee seed assistance, and rejuvenation programs for old and dead plants.</li> <li>• Training for field agricultural officers and extension workers, harvesting and post-harvest training, harvesting and post-harvest equipment assistance, such as pulper, huller, scales, solar dryer, etc.</li> <li>• Meanwhile, downstream, the Temanggung Regency Government provides coffee processing guidance, assistance for roasting equipment, grinding, packaging, and even guidance for the household coffee industry.</li> </ul>

Source: Primary and Secondary Analysis Data (2022)

One of the factors for the success of coffee development is government support in the availability of superior and quality planting materials through clones adapted to the planting environmental conditions. The Integrated Pest Management Field School Program began during the regional autonomy era. In 2010, the government began to form coffee processing clusters, based on the Decree of the Temanggung Regent Number 500/280/2010. Coffee clusters were formed in sub-districts in Temanggung Regency. To maintain the special taste of Temanggung coffee, the regional government is applying for legal protection through Intellectual Property in the form of Geographical Indications.

The government facilitated the formation of the Community Group for the Protection of Geographical Indications for Temanggung Robusta Coffee, which was officially confirmed based on Notary Deed Number 109 on December 14, 2015. In 2016, the Community Group for the Protection of Geographical Indications for Temanggung Robusta Coffee supervisors was appointed based on the Decree of Temanggung Regent Number 150/186. One of the



Community Group for the Protection of Geographical Indications goals is to encourage farmers to produce coffee in the form of beans, not only selling it in “logs”, which farmers have mostly done. However, the Community Group for the Protection of Geographical Indications is experiencing ups and downs, and institutional dynamics can be seen in it. It can be seen that the Community Group for the Protection of Geographical Indications needs institutional strengthening to continue.

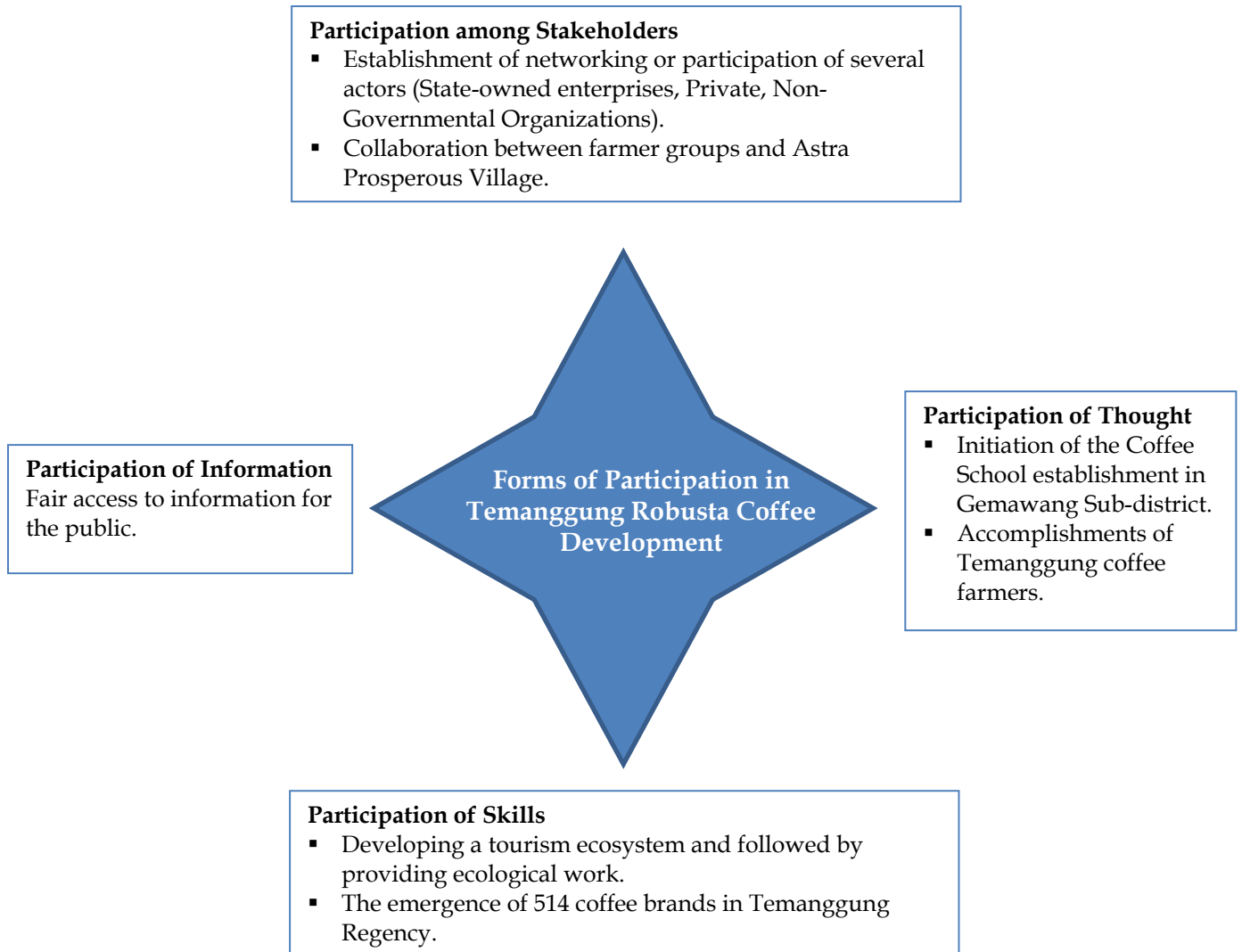
The development of coffee is inseparable from the involvement of stakeholders. The government plays an important role as a regulator, dynamist, facilitator, and catalyst (Raintung et al., 2021). Stakeholders in this case (the Office of Food Security, Agriculture and Fisheries, the Office of Village Community Empowerment, the Office of Cooperatives and SMEs, the Office of Industry and Labor, and the Regional Government Planning Agency) do not stop making policies for the development of robusta coffee from Temanggung. In 2018, the Regent of Temanggung launched the “one-day coffee” movement within the government. The government followed this up through the Regent Circular Letter Number 500/513/IX/2019, which mentions “Friday as the coffee day for the people of Temanggung.”

Various cross-sectors outside of agriculture have also contributed to advancing Temanggung coffee. One is the Village Community Empowerment Service of Temanggung Regency, as Mr. AR stated:

*“We have networks with villages, and we usually invite villages through APBDes (Village Revenue and Expenditure Budget) to grow coffee. If there are villages that do not have coffee plantations like in the Kranggan area, they will move with us to at least maintain coffee (tradition)” (Interview with Mr. AR, 2022).*

The problem often occurs when farmers harvest coffee with green “*ijon*” beans. This follows research by Sumarjo et al. (2020) from 220 respondents from 11 sub-districts in Temanggung Regency. Only 3.27% of farmers harvest coffee when it is in the logs or red. This situation is caused by many factors, for example, urgent household needs, forcing farmers to sell their agricultural products immediately. This problem has made the district government initiate red-picking festival activities even down to the sub-district level. Apart from being a form of gratitude for the coffee harvest, this activity was carried out as an effort to encourage farmers to comply with standard operating procedures (SOP), one of which is waiting for the harvest until the coffee beans turn red to maintain the quality of Temanggung Robusta coffee.

The transformation of various power policies shows a change in the development system. It can be seen from the history and policy development of Temanggung coffee, which originally started from a centralized sectoral planning approach, starting in the colonial era with the state’s role as the main actor. All policy control and implementation of plantation operations are still in the hands of the government and are top-down. Along with developments, a more bottom-up approach has emerged locally.



**Figure 5. Forms of Participation in Coffee Development in Temanggung Regency**

Source: Primary Data Analysis (2022)

The growth of community-based institutions serves as a conduit for coffee development by empowering farmers. The transformation process can be seen from the strengthening of community participation. Community participation can bring about a fair redistribution of power. Forms of community participation in the development of Temanggung coffee are shown in **Figure 5**. This study shows that the current development of coffee shows a participatory or bottom-up pattern with the strengthening of local community business groups. This is an important pillar in the development of coffee farming. In a bottom-up participatory style, the community began to independently establish coffee cafes and brands facilitated by the government in Micro, Small and Medium Enterprises (MSMEs), which now have 514 coffee brands in Temanggung. Strengthening existing groups based on people's desires is the foundation for sustainability.

Apart from the emergence of local Temanggung coffee brands, a concrete manifestation of community participation and the quality of Temanggung coffee can be seen in the achievements that have been achieved. Achievement is an important indicator of the results obtained and practiced during cultivation, harvest, and post-harvest. This can be seen from the achievements or actual abilities of the Temanggung coffee business actors. Since 2014 until now, many competitions have been won at regional, national, and international levels. Several

achievements include 2nd place in the National Robusta Coffee in the Nusantara Coffee Taste Contest, 3rd place in Agence Pour La Valorization Des Produits Agricoles (AVPA) Paris, and others. The achievements achieved by each cluster are different. This is based on the performance of each of these clusters or the level of performance (achievement level), which is closely related to the achievement motivation of the Temanggung coffee business actors.

## 5. Discussion

The development of coffee in Temanggung Regency has been through three key sectors: government, large private plantations, and the local community. This cohesive development strategy has been sustained over different periods of governance. Each stakeholder—government bodies, private corporations, and the community—has significantly impacted the trajectory of Temanggung coffee. The government's role is pivotal, with the potential to steer the course of robusta coffee development in Temanggung from the inception of cultivation to the final stages of processing and marketing. The government's formulation of supportive policies at the regency, Central Java Province, and national levels can stimulate and channel the growth of robusta coffee.

Private companies also play a crucial role, expected to contribute through their corporate social responsibility (CSR) initiatives. Collaborative efforts between private entities, the government, and the local community can foster community development projects and aid coffee farmers. The journey of Temanggung robusta coffee has traversed a range of local government policies aimed at generating employment opportunities, establishing stable income sources, enhancing the well-being of farmers, and propelling the holistic advancement of Temanggung Regency.

The legacy of coffee cultivation during the Colonial era continues to influence its contemporary development significantly. The meticulous management of coffee, from on-farm cultivation to off-farm processing, has emerged as a model for local communities in Temanggung to engage in robusta coffee cultivation, production, and marketing. However, a pertinent question arises: why has Temanggung robusta coffee not achieved the recognition enjoyed by other varieties like Kintamani coffee, Aceh Gayo coffee, and Bajawa Sumba coffee, which have garnered international popularity?

This phenomenon can be attributed to several factors. Firstly, fluctuating productivity levels have been observed despite a commendable 47% expansion in robusta coffee cultivation over five years. The peak productivity of 0.86 tons per hectare was attained in 2018, while the lowest was recorded at 0.47 tons per hectare in 2017 (Septiani & Kawuryan, 2021). Secondly, local coffee farmers in Temanggung continue to employ unstructured picking practices, favoring green picking due to its prompt income. Actually, red-harvested coffee produces heavier beans with a bigger and more perfect shape, tastes better, lasts longer when stored in warehouses, sells at higher prices and is much in demand by coffee companies.

Third, the government of Temanggung Regency is not yet optimal in making policies to protect Temanggung coffee products, especially in the coffee marketing sector. Fourthly, the restricted market share, particularly for export-grade products, can be attributed to the inadequate understanding among coffee farmers regarding the criteria for export-worthy coffee. The absence of standardized robusta coffee from Temanggung has rendered international buyers apprehensive. Moreover, the absence of proper storage facilities has led to a limited shelf life, thwarting the fulfillment of significant orders.

Fifthly, the capabilities of extension agents in coffee cultivation remain inadequate, casting doubt on the necessity of their role. The gathered data indicates that the skills of these extension

agents in coffee cultivation are still subpar and misaligned with the aspirations of developing Temanggung robusta coffee. Lastly, the recognition of geographical indications should ideally invigorate Temanggung robusta coffee. Regrettably, the current implementation of the Community Group for the Protection of Geographical Indications for Temanggung Robusta Coffee appears stagnant due to insufficient financial allocation by the local government.

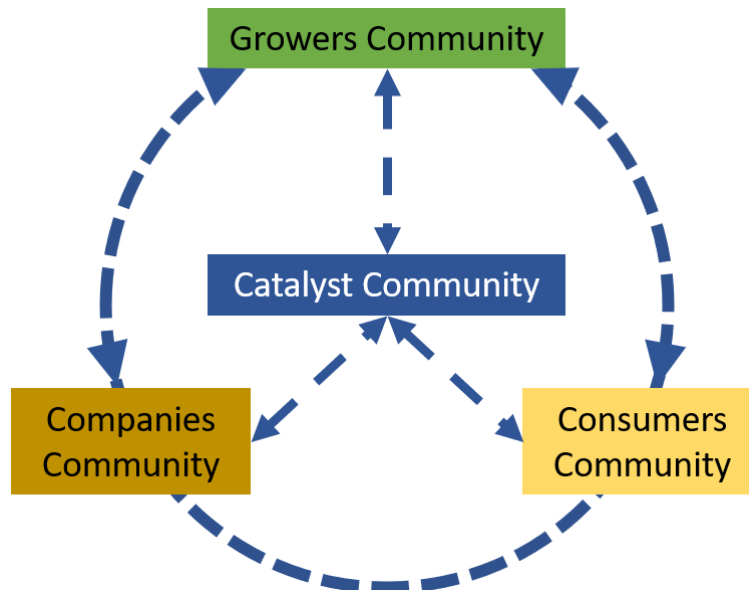


Figure 6. Communities Cycle Integration

The local government seems to be still responsible for developing Temanggung Robusta coffee, resulting in a lack of collaboration among related stakeholders. As Sumarjo et al. (2020) suggested, adopting Geographical Indication Standard Operating Procedures (SOP) for robusta coffee in Temanggung necessitates cooperative efforts involving the government, private sector, universities, and the Community Group for the Protection of Geographical Indications. Such collaboration is paramount to providing education, facilitation, and support during adoption, ensuring high-quality, distinct, and competitive coffee production.

Taking cues from coffee management in Colombia, four critical elements drive coffee development: the growers' community, the companies' community, the consumers' community, and the catalyst community (Villegas & Serrano, 2007). The growers' community serves as a platform for coffee farmers to efficiently and progressively manage coffee plantations, introducing novel technologies and cultivation models. Establishing networks among farmer associations, coffee processors, and other stakeholders is crucial for fostering vertical coordination among companies' communities and accelerating investments in coffee-related industries—the consumers' community benefits from the products produced by the growers' community. The catalyst community plays a pivotal role in uniting these three elements, utilizing policies to catalyze Temanggung coffee development in the future.

## 6. Conclusion

The multi-dimensional approach to coffee development in Temanggung Regency, involving government, private entities, and the local community, has resulted in a complex interplay of factors. The government's policies, private sector engagement, and community empowerment collectively influence the trajectory of robusta coffee development. However, despite consistent growth, Temanggung robusta coffee has yet to achieve the same recognition as other renowned

coffee varieties. This can be attributed to several factors, including fluctuating productivity, unstructured harvesting practices, suboptimal policies, limited market access, inadequate extension services, and the absence of standardized production.

The local government's leadership remains pivotal, but collaborative efforts among stakeholders are crucial to overcome the identified challenges. Synergizing government policies, private sector support, and community engagement will be instrumental in elevating Temanggung robusta coffee to the success of other premium coffee varieties. By addressing the identified challenges and building a holistic coffee ecosystem involving all stakeholders, Temanggung Regency can aspire to create a vibrant and sustainable coffee industry that thrives locally and gains international recognition.

## 7. Acknowledgment

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## 8. Declaration of Conflicting Interests

The authors have declared no potential conflicts of interest concerning this article's research, authorship, and/or publication.

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