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IMPROVEMENT AND EQUITABLE ECONOMIC DISTRIBUTION BASED ON VILLAGE POTENTIAL AND GREEN INDUSTRY IN CENTRAL JAVA

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ABSTRACT

Purpose: This article aims to examine strategies for promoting equitable economic growth in Central Java through a decentralized, village-based green economy by integrating local products, natural capital, and local wisdom within a territorial capital and circular economy framework.

Design/methodology/approach: This study employs a qualitative descriptive-analytical approach based on structured document analysis and purposive multiple-case comparisons involving natural-dye batik, coconut sugar, the Karangsambung–Karangbolong Geopark, and Sambak Village.

Findings: The findings identify institutional barriers, including limited green standards for micro-enterprises, weak BUMDes governance and financial capacity, inadequate green financing, and insufficient protection of natural assets. Four policy interventions are proposed: micro-scale Green Industry Standards (SIH-Mikro), BUMDes as green business aggregators, labor-intensive green credit, and ecotourism zoning.

Research limitations/implications: This study relies on secondary data and selected cases in Central Java. Future research should examine the implementation and impact of the proposed policies through empirical investigations.

Originality/value: This article integrates local products, natural capital, and local wisdom into a village-based green economy framework and offers practical policy recommendations to promote inclusive growth, community welfare, and environmental sustainability toward Golden Indonesia 2045.

Paper type: qualitative descriptive-analytical

Keywords: Circular Economy, Green Industry, Local Wisdom, Village Empowerment, Territorial Capital

A. INTRODUCTION

Central Java's contemporary socio-economic landscape is undergoing a critical transformation. Historically, economic growth has relied heavily on centralized industrialization, often ignoring rural areas as suppliers of raw materials. However, the current consensus emphasizes a decentralized, resource-efficient, and culturally rooted model to improve rural infrastructure and economic performance. Central Java's new leadership is strongly championing this transition. Inaugurated in February 2025, Governor Ahmad Luthfi and Deputy Governor Taj Yasin Maimoen introduced the vision of "Central Java as a Sustainable Advanced Province to Move Towards a Golden Indonesia 2045".

Central Java's economic trajectory has shown strong resilience. According to BPS-Statistics of Jawa Tengah Province, the provincial economy grew by 5.84% year-on-year (*y-on-y*) in the fourth quarter of 2025. This growth above the national rate of 5.39% for the same quarter, while growth for the whole of 2025 reached 5.37%, up from 4.95% in 2024 and above the national rate of 5.11% (Badan Pusat Statistik [BPS] Provinsi Jawa Tengah, 2025, 2026a; Bank Indonesia, 2026). Poverty nonetheless remains considerable: 9.39% of the provincial population, or about 3.34 million people, were poor in September 2025 (BPS Provinsi Jawa Tengah, 2026b), and the incidence is markedly

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higher in some districts. In March 2025, for example, the poverty rate in Kebumen Regency was 13.58%, against 9.48% for Central Java as a whole (GoodStats, 2025a, 2025b). Despite this aggregate growth, distributing economic benefits equitably across rural geographies remains a major challenge. Rapid urbanization and infrastructure expansion, especially along Central Java's North Coast, have triggered severe environmental externalities. Issues such as land subsidence, shoreline erosion, and an estimated cumulative carbon loss of up to 1,062,214.77 t C by 2020 across 14 districts/cities (Krisnanta et al., 2025) underscore the existential imperative to decouple economic expansion from environmental degradation. To address this imbalance, the provincial government has explicitly set 2028 as a focal point to "improve and equalize the economy based on the potential of green villages and industries" (Bappeda Provinsi Jawa Tengah, 2024).

Recent empirical studies have highlighted the great potential of integrating local assets with sustainable practices. In the context of local products, Awami and Faza (2025) apply the Hayami method to a coconut-sugar processing center in Purbalingga Regency and find that processing coconut sap into sugar adds IDR 689.81 per kilogram, a value-added ratio of 34.86% that falls in the medium category. Kusumastuti et al. (2023), surveying 209 natural-dye batik producers, show that social, quality, and green values shape producers' attitude and satisfaction. Which in turn predict their intention to produce natural-dye batik, a less polluting alternative to synthetic dyes. In terms of local wisdom and natural assets, Widia and Wibisono (2024) analyze the economic institutions of Sambak Village in Magelang Regency, a recognized Climate Village, and argue that integrating its micro, small, and medium enterprises (MSMEs) and Village-Owned Enterprises (BUMDes) can position the village as a model of energy-independent educational tourism; Ningtyas et al. (2020) examine community empowerment through energy-independent villages in Klaten Regency; and Santoso and Syaifudin (2025) assess tourism-object development by a regionally owned enterprise (BUMDER) as an instrument of community empowerment in Brintik Village, Klaten Regency. Furthermore, Pertiwi et al. (2026) examine what drives linkages between green MSMEs and large food-and-beverage firms in East Java, a question central to strengthening circular-economy value chains.

Despite the abundance of individual success stories, three research and policy gaps remain. First, the evidence is fragmented. Each study above examines a single commodity, institution, or village, usually at the producer or household level, so little is known about how local products, natural capital, and local wisdom jointly shape welfare, employment, and benefit distribution across villages. Second, the structural barriers that prevent village MSMEs from entering formal green-industry regimes have yet to be analyzed: Green Industry Standards (Standar Industri Hijau, SIH) are issued sector by sector and are applied for by industrial companies (Kementerian Perindustrian, 2023), which presupposes a degree of formalization and compliance capacity that many village enterprises lack. Third, to our knowledge, no integrated policy formulation yet synchronizes local wisdom (*Local Wisdom*) with the provincial "Developed and Empowered Villages" priority program for 2025–2030.

This paper addresses these gaps and makes three contributions. Conceptually, it combines the territorial-capital approach (Camagni, 2009) with circular-economy thinking (Kirchherr et al., 2017) to treat products, nature, and culture as complementary village assets whose returns depend on institutional governance. Analytically, it re-reads evidence from four Central Java cases through an equity lens, tracing three channels: welfare, employment, and the distribution of benefits at the village level. In terms of policy, it translates the findings into an implementation matrix for 2026–2030 that specifies lead agencies and monitoring indicators and spells out the roles of local governments and BUMDes. The study is guided by three questions: (1) How do local products, ecotourism, and renewable energy initiatives contribute to village welfare, employment, and the distribution of benefits? (2) Which institutional constraints limit their scaling? (3) Which policy interventions can address these constraints and align them with the province's 2025–2030 priorities?

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B. LITERATURE REVIEW

To counter spatial economic imbalances and track progress toward the vision of a Golden Indonesia 2045, the National Medium-Term Development Plan (RPJMN) 2025–2029 sets quantitative socio-economic and environmental targets (Table 1; Presiden Republik Indonesia, 2025), which provinces localize through their own planning instruments. Central Java Governor Regulation No. 36 of 2024 establishes the Regional Action Plan for the Sustainable Development Goals (RAD-TPB) 2024–2026 (Pemerintah Provinsi Jawa Tengah, 2024), and the Initial Draft of the Central Java Regional Medium-Term Development Plan (Ranwal RPJMD) 2025–2029 is the principal medium-term reference for the province's 2025–2030 leadership agenda, including its emphasis on the circular economy, local resource-based development, and green industrialization (Bappeda Provinsi Jawa Tengah, 2024).

Two analytical lenses frame the discussion. Territorial capital refers to the stock of tangible and intangible assets of a place natural, cultural, human, and institutional that shape its development opportunities (Camagni, 2009); here it directs attention to the village's products, landscapes, and customary knowledge. The circular economy is a system that replaces the end-of-life concept with reducing, reusing, recycling, and recovering materials (Kirchherr et al., 2017); at the village scale, it corresponds to waste-to-energy, natural-dye, and by-product practices. Combined, the two lenses imply that village assets generate equitable gains only when institutional standards, enterprises, finance, and spatial rules allow the value created to be retained and shared locally. In community-based ecotourism, such retention is often conceptualized as the economic, psychological, social, and political empowerment of local communities (Scheyvens, 1999).

Table 1. National Development Targets (RPJMN 2025–2029) and Central Java Realization

Indicator	National baseline (period)	National target 2025	National target 2029	Central Java realization (period)
Economic growth, y-o-y (%)	n.a.	n.a.	8.0	4.95 (2024, annual); 5.37 (2025, annual); 5.84 (Q4 2025). National: 5.11 (2025, annual); 5.39 (Q4 2025)
Poverty rate (% of population)	9.03 (March 2024)	7.0–8.0	4.5–5.0	10.47 (March 2024); 9.39 (September 2025)
GHG emission intensity reduction (%)	34.09 (2022)	35.53	45.17	n.a.
Human Capital Index (HCI)	0.54 (2020)	0.56	0.59	n.a.

Notes: y-on-y = year-on-year; RPJMN = National Medium-Term Development Plan (Rencana Pembangunan Jangka Menengah Nasional); GHG = greenhouse gas; HCI = Human Capital Index (Indeks Modal Manusia); n.a. = not available in the cited sources. Growth is expressed as annual growth or as y-o-y growth in the quarter indicated. Poverty is the percentage of the population below the poverty line. Sources: national baselines and targets, Presiden Republik Indonesia (2025); Central Java growth, BPS Provinsi Jawa Tengah (2025, 2026a); Central Java poverty, BPS Provinsi Jawa Tengah (2024, 2026b); national growth, Bank Indonesia (2026).

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C. METHODOLOGY

Research design. This study adopts a qualitative descriptive-analytical design suited to policy formulation, combining structured document analysis (Bowen, 2009) with a purposive multiple-case comparison (Creswell & Poth, 2018; Yin, 2018). The design is interpretive and policy-oriented: it does not estimate causal effects but synthesizes documented evidence to explain how village assets can be converted into welfare, employment, and shared benefits, and to derive implementable interventions. The analysis is guided by the territorial-capital and circular-economy frameworks outlined above. No primary data were collected; evidence on institutional empowerment at the village level is drawn from the qualitative fieldwork reported in the original studies (e.g., Widia & Wibisono, 2024).

Data sources and document selection. Three groups of documents were used. (i) Official statistics: releases of BPS-Statistics of Jawa Tengah Province on economic growth and poverty, and Bank Indonesia's release on national growth, for the 2024–2025 reporting periods. (ii) Policy and regulatory documents: the RPJMN 2025–2029 (Presidential Regulation No. 12 of 2025), Central Java Governor Regulation No. 36 of 2024, the Initial Draft of the RPJMD 2025–2029, and the Ministry of Industry regulations on Green Industry Standards for the batik industry (Regulation No. 10 of 2023) and for fabric finishing and printing (Regulation No. 40 of 2022). (iii) Empirical literature published between 2020 and 2026. Documents were selected purposively against four criteria: relevance to at least one study theme (local-product value added, natural-capital-based tourism, local wisdom and renewable energy, green-industry standards and linkages, or BUMDes governance); a Central Java setting or direct relevance to Central Java's policy context; provenance from peer-reviewed journals, official statistical agencies, or government regulations; and verifiable bibliographic details. Studies from other provinces were retained only as comparators where they addressed a mechanism absent from the Central Java evidence (Pertiwi et al., 2026). Statistical figures come from the latest official releases available at the time of revision and are reported with their reference periods.

Case selection. Four cases were selected purposively to represent the three village assets under study: natural-dye batik (Pekalongan and other batik centers) and coconut sugar (Purbalingga) as local products; the Karangsambung–Karangbolong/Kebumen Geopark in Kebumen Regency as natural capital; and Sambak Village in Magelang Regency as an example of local wisdom linked to renewable energy. Each case had to (a) be located in, or directly relevant to, Central Java; (b) contain an explicit green or circular element; (c) involve village-level institutions such as BUMDes, MSMEs, or Tourism Awareness Groups (Pokdarwis); and (d) be documented in at least one source meeting the criteria above. The set was designed for variation across asset types rather than statistical representativeness, so the findings are analytically, not statistically, generalizable.

Analytical procedure. Analysis proceeded in four steps. First, each document was read in full and coded in a matrix recording the asset type, the green or circular practice, the institutional actors, the reported economic outcomes (e.g., value added, income, employment), and the barriers and enabling conditions. Second, codes were grouped into themes using thematic analysis (Braun & Clarke, 2006) and compared across cases along three outcome channels: community welfare, employment creation, and the distribution of benefits. Third, recurring barriers were mapped to candidate interventions, and each intervention was matched with the agency holding the relevant regulatory or budgetary mandate, producing the implementation matrix in Table 3. Fourth, the draft recommendations were checked against the provincial priority program and the national targets in Table 1 to ensure policy coherence. Triangulation across statistical, regulatory, and scholarly sources was used to strengthen credibility; each claim in the Results is traced to its source, and where the evidence is only indicative, the text says so.

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D. RESULTS AND DISCUSSION

Central Java's comparative advantage lies in its unique and culturally significant local products, environmental capital, and customary practices. Table 2 summarizes the core domains where village potential meets the green transition. The entries combine documented outcomes with analytical propositions, which are labeled as such.

Table 2. Village Potential and Green-Transition Pathways in Four Central Java Cases

Category	**Core locations**	**Conventional practice**	**Green transition model**	**Documented outcomes and analytical propositions**
Local product: natural-dye batik	Pekalongan and other batik centers	Synthetic dyes; untreated wastewater discharged into rivers	Plant-based natural dyes; proposed micro-scale SIH (SIH-Mikro) certification	Documented: producers' attitude, satisfaction, and production intention rise with green, quality, and social value (Kusumastuti et al., 2023). Proposed: cultural branding, premium positioning, and lower effluent loads in river ecosystems.
Local product: coconut sugar	Purbalingga	Household production of molded brown coconut sugar	Processing at village centers; proposed upgrading to organic ant sugar with BUMDes supply aggregation and certification	Documented: value added of IDR 689.81/kg and a ratio of 34.86% (medium) for sap-to-sugar processing (Awami & Faza, 2025). Proposed: export-market access through ant sugar (premium not yet measured).
Natural capital: geoheritage	Kebumen (Karangsambung–Karangbolong area; Geopark Kebumen)	Extractive mining pressures on geological sites	Community-based ecotourism and geoheritage conservation with Pokdarwis and BUMDes	Documented: geopark of 543.599 km² (2018), expanded to 1,138.70 km² of land in 2023 (Ansori et al., 2020; Pemerintah Kabupaten Kebumen, 2023). Proposed: local revenue retention, geoheritage protection, and alternative livelihoods in a poverty-prone district.

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Cultural wisdom: energy-independent village	Magelang (Sambak Village, Kajoran Subdistrict)	Reliance on external energy supply	Biogas from organic waste; integration of MSMEs and BUMDes; educational tourism (Eduwisata)	Documented: recognition as Climate Village and Independent Innovation Champion (Widia & Wibisono, 2024). Proposed: local energy independence, circular economy, and local jobs (not yet quantified).

Notes: SIH = Green Industry Standard (Standar Industri Hijau); BUMDes = Village-Owned Enterprise; Pokdarwis = Tourism Awareness Group; MSME = micro, small, and medium enterprise; IDR = Indonesian rupiah. Entries labeled "Proposed" are analytical propositions, not measured outcomes. Source: authors' synthesis from Ansori et al. (2020), Awami and Faza (2025), Kusumastuti et al. (2023), Pemerintah Kabupaten Kebumen (2023), and Widia and Wibisono (2024).

Local Product Advantages: Green Transition

Natural-Dye Batik

Batik is an intangible cultural heritage produced in several Indonesian regions, and Pekalongan is among Central Java's principal batik centers. Conventional batik production relies on chemical dyes and releases wastewater that is often discharged with little treatment, whereas rising ecological awareness has spurred a return to plant-based natural dyes (Kusumastuti et al., 2023). In a survey of 209 producers, Kusumastuti et al. (2023) find that social, quality, and green values raise producers' attitude and satisfaction, that both predict production intention, and that economic value shapes attitude but not satisfaction. Two implications follow for welfare and equity. First, the transition is not driven by price alone, so policies that merely promise premium prices are unlikely to suffice; recognition of cultural and ecological value also matters. Second, producers who internalize green value are more likely to sustain natural-dye production, which can reduce effluent loads in the rivers downstream villagers depend on (an analytical inference rather than a measured outcome). However, formalizing this transition faces institutional hurdles. The Ministry of Industry issues Green Industry Standards (SIH) sector by sector. The current batik standard is Ministry of Industry Regulation No. 10 of 2023, which replaced Regulation No. 39 of 2019 and provides that industrial companies may apply for Green Industry certification (Kementerian Perindustrian, 2023); the standard for fabric finishing and printing is Regulation No. 40 of 2022 (Kementerian Perindustrian, 2022). Because certification is framed around industrial companies, village batik MSMEs that already practice ecologically sound production may face formalization and compliance costs that discourage them from seeking recognition, leaving them with bureaucratic friction despite their sustainable practices. This mismatch motivates the micro-scale standard (SIH-Mikro) proposed in Table 3.

a. Coconut Sugar and the Ant Sugar Pathway in Purbalingga

Traditionally, coconut sap in areas such as Purbalingga is processed by household craftspeople into molded brown coconut sugar. Using the Hayami method of value-added analysis, Awami and Faza (2025) find that processing coconut sap into coconut sugar at a processing center in Purbalingga adds IDR 689.81 per kilogram, a value-added ratio of 34.86% (medium category), and that production capacity, raw-material use and cost, output price, and other input prices significantly affect value added. Upgrading to organic granulated coconut sugar (*ant sugar*; *gula semut*) is widely promoted as a further diversification strategy for the international organic market, which relies on dependable supply chains and organic certification, functions that BUMDes could perform as aggregators. The Central Java evidence cited here, however, does not measure the price premium or

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added value of ant sugar itself; this remains an empirical gap and a priority for the monitoring indicators in Table 3. For equity, the relevant question is how the 34.86% value-added share is divided among sap tappers, processors, and traders, which depends on bargaining power and market access rather than on technology alone.

Harnessing Natural Capital: Geoheritage and Ecotourism

Central Java's diverse topography provides fertile land for community-based ecotourism (CBT) and conservation of earth's heritage. The Karangsambung-Karangbolong National Geopark in Kebumen Regency is the main model. Designated a national geopark in 2018, it originally covered 543.599 km² across 12 subdistricts and 117 villages and combined geological conservation with community economic development (Ansori et al., 2020); in 2023 it was renamed Geopark Kebumen and expanded to 1,138.70 km² of land and 21.98 km² of sea (Pemerintah Kabupaten Kebumen, 2023). Its location in a poverty-prone district matters for equity: Kebumen's poverty rate (13.58% in March 2025) is well above the provincial rate (9.48%) (GoodStats, 2025a, 2025b), so geopark-based ecotourism is not only a conservation instrument but also a potential channel of spatial redistribution. Pokdarwis and BUMDes are the natural vehicles for guided trips, educational tours, and homestays, but whether tourism revenues are retained in the village ecosystem depends on local ownership and benefit-sharing rules. Santoso and Syaifudin (2025) examine a comparable enterprise-managed tourism object in Brintik Village, Klaten Regency. Community-based ecotourism is also most beneficial when it empowers communities economically, psychologically, socially, and politically rather than merely employing them (Scheyvens, 1999).

Cultural Wisdom and Energy Independence

Integrating local wisdom (*kearifan lokal*) into village institutions can strengthen community ownership of sustainability initiatives (Widia & Wibisono, 2024). Sambak Village in Kajoran Subdistrict, Magelang Regency, was recognized as a Climate Village and Independent Innovation Champion. It integrates MSMEs with BUMDes and pursues energy independence by processing organic waste into biogas, and Widia and Wibisono (2024) find that this integration requires empowerment programs in institutional management, administration, finance, promotion, and digital marketing. They argue that the village can become a model and destination for energy-independent educational tourism (*Eduwisata*). Evidence from Klaten Regency suggests that energy-independent village programs can be an entry point for community empowerment (Ningtyas et al., 2020). In such cases, renewable energy from village waste streams can lower the energy costs of village enterprises and create operation and maintenance tasks; however, the cited studies do not quantify cost savings or jobs, so these effects should be treated as plausible and monitored.

Contribution to Welfare, Employment, and the Distribution of Benefits

Synthesizing the four cases, local products, ecotourism, and renewable energy initiatives can contribute to village development through three channels: welfare, employment, and the distribution of benefits. Evidence strength differs across channels and cases, so documented outcomes are distinguished from analytical propositions.

Welfare. The strongest quantified evidence concerns coconut sugar, where sap processing yields a value-added ratio of 34.86% (Awami & Faza, 2025). For natural-dye batik, the evidence concerns producers' intentions rather than income (Kusumastuti et al., 2023), so welfare gains remain plausible but unquantified. In ecotourism and renewable energy, welfare effects are mediated by institutions: Widia and Wibisono (2024) emphasize that BUMDes and MSMEs must first be strengthened in management, finance, and marketing. Where villages generate energy from their own waste streams, households and enterprises may reduce spending on purchased energy, but the cited studies do not measure this saving.

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Employment. Three mechanisms are plausible. Upgrading processing activities (from sap to sugar, from synthetic to natural dyeing) retains labor-intensive tasks such as tapping, extraction, and finishing within the village and creates demand for aggregation, quality control, and packaging. Ecotourism generates service jobs in guiding, homestays, food provision, and transport, which may matter especially for young people and women in villages with limited non-farm opportunities. Renewable-energy and waste-management facilities create operation and maintenance work. None of the reviewed studies quantifies net job creation, which is why employment indicators are included in the monitoring framework (Table 3) and why a quantitative impact assessment is a priority for future research.

Distribution of benefits. Three distributional margins deserve policy attention. Within villages, better-endowed households or managers may capture benefits unless BUMDes and Pokdarwis adopt transparent benefit-sharing rules that reach poor households, women, and smallholder producers (Scheyvens, 1999). Between villages, the concentration of poverty in districts such as Kebumen suggests that geopark revenues should be shared beyond gateway villages. Along value chains, linkages between green MSMEs and large firms, such as those examined by Pertiwi et al. (2026), can raise MSME incomes only if off-take terms are fair and stable. Table 3 therefore links each intervention to indicators of who benefits and how much is produced.

Strategic Policy Recommendations (2026–2030)

To align with Governor Ahmad Luthfi's priority programs, specifically the mandate for "Developed and Empowered Villages" (Bappeda Provinsi Jawa Tengah, 2024), and to catalyze the transition of Central Java villages into a sustainable economic engine, the interventions summarized in Table 3 are recommended. Each intervention is linked to lead agencies and monitoring indicators so that progress can be tracked within the RPJMD cycle.

Table 3. Policy Implementation Matrix for Village-Based Green Industry, 2026–2030

Strategic objective	**Key interventions**	**Lead implementing agencies**	**Targeted outcomes**	**Monitoring indicators**
1. Mainstream a micro-scale Green Industry Standard (SIH-Mikro)	Develop a simplified, digital green standard calibrated for village MSMEs in biological resources, with a stepwise path to sector SIH certification.	Disperindag; Ministry of Industry	More village MSMEs with recognized green certification and better market access.	Number and share of village MSMEs certified under SIH-Mikro; share of women-led enterprises among them.
2. Empower BUMDes as commercial green utilities	Facilitate public–private partnerships (PPPs) for village microgrids and refuse-derived fuel (RDF); strengthen BUMDes legal status, accounting, and aggregation functions.	Dispermades; BPDLH; regional banks	BUMDes operate legally and financially as commercial green utilities.	Number of BUMDes with audited accounts; off-take agreements signed; share of profits distributed to poor households.
3. Implement green finance	Tailor labor-intensive investment credit for green-technology acquisition by village MSMEs and BUMDes.	OJK; Bank Jateng	Support technological upgrades for rural artisans (e.g., solar	Value and number of green credits disbursed to village enterprises; jobs supported.

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			drying for sugar).	
4. Ecotourism zoning	Enforce conservation buffer zones in digital detailed spatial plans (RDTR); extend revenue sharing beyond gateway villages.	Bappeda; Disporapar	Preserve geographical heritage and support long-term, sustainable tourism growth.	Share of geopark-area villages with RDTR buffer zones; share of tourism revenue retained by village institutions.

Notes: BPDLH = Environmental Fund Management Agency (Badan Pengelola Dana Lingkungan Hidup); Bappeda = Regional Development Planning Agency; BUMDes = Village-Owned Enterprise; Disperindag = Provincial Office of Industry and Trade; Disporapar = Provincial Office of Youth, Sports, and Tourism; Dispermades = Provincial Office of Community and Village Empowerment; MSME = micro, small, and medium enterprise; OJK = Financial Services Authority; RDTR = detailed spatial plan; SIH = Green Industry Standard—source: authors' formulation based on the analysis in this paper.

Detailed Policy Mechanism:

1. Mainstreaming "SIH-Mikro" for MSMEs in biological resources: To address the regulatory disconnect observed in the batik sector, the provincial government should coordinate with the Ministry of Industry to develop an efficient, digital micro-scale Green Industry Standard ("SIH-Mikro") with simplified documentation and a stepwise path toward full sector certification (Kementerian Perindustrian, 2023). Compliance metrics should recognize indigenous sustainable practices.
2. Empowering BUMDes as commercial green utilities: BUMDes should be legally and financially professionalized, in line with Government Regulation No. 11 of 2021 on Village-Owned Enterprises (Pemerintah Republik Indonesia, 2021), to operate as commercial aggregators for the circular economy and to sign long-term off-taker agreements with large industries (Pertiwi et al., 2026). Transparent benefit-sharing rules should ensure that returns reach poor households.
3. Implementing local green finance mechanisms: Financial institutions such as Bank Jateng should disseminate investment credit tailored to green technology acquisition to overcome capital constraints and financial literacy gaps among rural artisans. Credit terms should favor labor-intensive investments, such as solar dryers for coconut sugar.
4. Strengthening ecotourism spatial zoning: To protect natural assets, the regional spatial plan (RTRW) and its detailed spatial plans (RDTR) should enforce conservation buffer zones that prohibit extractive mining. Tourism initiatives should be bundled with digital marketing platforms, and revenue-sharing arrangements should extend to villages beyond the main gateways.

E. CONCLUSION

Main findings. This paper examined how village potential, green industry, and local wisdom can support equitable economic distribution in Central Java. Three findings stand out. First, village assets generate value when they are linked to green and circular practices. However, the evidence is uneven: it is quantified for coconut-sugar processing (a value-added ratio of 34.86%) and largely behavioral or institutional for natural-dye batik, geoheritage-based ecotourism, and energy-independent villages. Second, the binding constraints are institutional rather than technological: Green Industry Standards framed around industrial companies, limited governance and financial capacity of BUMDes, scarce green finance, and weak spatial protection of natural assets. Third,

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equity outcomes depend on how benefits are shared within and between villages, which is especially relevant in poverty-prone districts such as Kebumen.

Contributions. The paper contributes an integrated territorial-capital and circular-economy framework that treats products, nature, and culture as complementary village assets; an equity-oriented reading of four Central Java cases through welfare, employment, and distribution channels; and an implementation matrix for 2026–2030 with lead agencies and monitoring indicators aligned with the province's "Developed and Empowered Villages" priority.

Implications for local governments. Provincial and district governments can (i) work with the Ministry of Industry to pilot SIH-Mikro for village MSMEs; (ii) embed conservation buffer zones and revenue-sharing rules in the RTRW and RDTR of geopark areas; (iii) work with Bank Jateng and other financial institutions to design labor-intensive green credit; and (iv) integrate the monitoring indicators in Table 3 into the RPJMD and annual work plans so that outcomes for poor households, women, and lagging villages are tracked.

Implications for BUMDes. BUMDes should strengthen their legal and financial governance in line with Government Regulation No. 11 of 2021; act as aggregators that standardize quality, obtain certification, and negotiate fair off-take agreements; adopt transparent benefit-sharing rules, including for poor households; invest in administration and digital marketing; and partner with universities and empowerment practitioners for capacity building.

Limitations and future research. This study has several limitations. It relies on secondary documents and does not collect primary data, so it cannot identify causal effects. The four cases were purposively selected, which limits generalizability, and welfare and employment outcomes were rarely quantified in the underlying sources. Some evidence comes from heterogeneous research designs and from comparators outside Central Java, and parts of the policy base, notably the Initial Draft of the RPJMD, may change once final regional documents are adopted. Statistical figures are also subject to routine BPS revisions. Future research should combine village surveys and quasi-experimental designs with input–output or social accounting matrix multipliers to quantify income and employment effects, test the added value of anti-sugar, and evaluate SIH-Mikro pilots.

Executing this strategy through collaborative governance and tailored regulatory support can help Central Java translate its village potential into more equitable and sustainable growth in line with the province's 2025–2030 leadership mandate.

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