

## Quantitative Turnaround Strategy for Green Tourism and Food Security in Yogyakarta's Lumbung Mataraman Model

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### ABSTRACT

Green tourism constitutes a multidimensional paradigm prioritising holistic sustainability, specifically environmental conservation, social responsibility, and equitable economic benefits for local communities. This study undertakes a rigorous investigation into the strategic development of green tourism, operationalised through the Lumbung Mataraman initiative, across the regencies of Gunungkidul, Bantul, and Kulon Progo within Yogyakarta's Special Administrative Region (DIY). The core research inquiry addresses the complex institutional and practical integration of village-level food security programmes into robust, locally-responsive sustainable tourism practices. The methodological objective was to quantitatively ascertain the definitive opportunities, challenges, and implementation strategies. Data acquisition was executed via a qualitative research design, employing in-depth interviews and focused group discussions, with advanced data processing facilitated by NVivo 12 software. Crucially, the strategic analysis employed a novel Coding Frequency Weighted SWOT Analysis. The quantitative findings yield a definitive strategic position in Quadrant II (Turnaround Strategy), evidenced by an External Factors Analysis Score (EFAS=1.00) that significantly outweighs the Internal Factors Analysis Score (IFAS=-0.22). The dominant systemic weaknesses involve a critical shortage of trained human capital and severely inadequate infrastructure, while the principal opportunities are anchored in the substantial allocation of the Privilege Fund and surging market demand for educational agro-tourism. Consequently, the research prescribes an immediate Weakness-Opportunity (W-O) strategy, demanding targeted interventions in capacity building, institutional strengthening, and aggressive agricultural diversification to stabilise the model's foundation before expansion. These empirical insights provide a robust, data-driven framework for policymakers and local stakeholders committed to enhancing rural development through genuinely integrated food security and tourism agendas.

**Keywords:** Green Tourism, Lumbung Mataraman, Food Security, Sustainable Tourism, SWOT Analysis.

**JEL Classification:** O13, Q01, Z32

## INTRODUCTION

### Contextualising Green Tourism and Food Security

The contemporary global discourse on sustainable development is fundamentally predicated on the necessary symbiotic relationship between local economic resilience and ecological integrity. Within the rapidly growing economies of Southeast Asia, particularly Indonesia, the maturation of the green tourism sector has emerged as an indispensable, dual-purpose strategy for simultaneously augmenting local economies and rigorously fortifying regional food security frameworks (Yuniarti et al., 2022; Amerta, 2019; Votsi et al., 2014).

The established concept of green tourism fundamentally transcends mere superficial environmental compliance. It is characterized by an explicit commitment to environmental preservation, stringent social responsibility, and the delivery of tangible economic benefits to indigenous communities (Ijatuyi et al., 2025). This model mandates a structured decision-making process focused on minimising ecological footprints while simultaneously cultivating authentic, memorable visitor experiences and generating measurable socio-economic value (Hassan et al., 2022; Ijatuyi et al., 2025). Within this framework, rural agritourism represents a critical and highly relevant typology. It strategically utilizes local agricultural endowments and rural landscapes to foster robust community empowerment and directly align with broader tourism-driven development imperatives (Joshi & Dhar, 2020).

Concurrently, food security, rigorously defined as the sustained, affordable access of a community to safe and nutritious food (Miles et al., 2025), is consistently rising to the forefront of national and regional development priorities (Imron, 2025). The innovative integration of tourism and agriculture is leveraged as a sophisticated mechanism to meet regional food security objectives, thus attempting to achieve a precarious yet vital equilibrium between accelerated economic growth and long-term environmental stewardship (Zheng et al., 2025). This intersection is crucial because tourism's demand for local produce can stimulate agricultural output, enhance supply chain stability, and provide premium market access for farmers, effectively turning tourism expenditure into a food security investment.

### The Lumbung Mataraman Initiative as an Integrated Model

In the Special Region of Yogyakarta (DIY), this vital theoretical convergence of sustainability, tourism, and food resilience is practically instantiated through the Lumbung Mataraman initiative. This regional programme, spearheaded by the provincial government, is explicitly conceived as an innovative mechanism to advance local food self-sufficiency (*Kaluraban Mandiri Pangan*) by systematically integrating agricultural production (including fisheries and livestock) with targeted, localised tourism development (Mungkhun et al., 2021).

The initiative strategically focuses on enabling local communities and optimising the utilisation of indigenous resources to stimulate sustainable and equitable economic advancement (Sugiharti, 2023). Its implementation is deeply rooted in Javanese cultural philosophy, particularly the concept of *Memayu Hayuning Bawono* (preserving universal harmony), which underscores the model's commitment to holistic well-being (Priyadi et al., 2022; Wildan et al., 2021).

Initial pilot sites were strategically inaugurated in 2022 in Semin (Gunungkidul) and Sendangsari (Kulon Progo). These efforts received dedicated, sustained financial support from the Dana Keistimewaan (Privilege Fund), a unique regional funding stream established specifically to uphold Yogyakarta's constitutional autonomy and cultural heritage (Jati, 2022). The documented success of these pilots in fostering both institutional readiness and high levels of community involvement subsequently led to the model's rapid expansion into five additional sites across Bantul and Kulon Progo by 2023.

### Challenges, Novelty, and Research Objective

Despite the philosophical depth and regional funding commitment, the model's full operational implementation is impeded by several structural constraints, validating the need for objective strategic analysis. These challenges include endemic issues such as inadequate physical infrastructure, deficient access to renewable energy, nascent digital tourism platforms, and a pressing need for innovation within local cultural and creative industries (Cornellia et al., 2025). These structural weaknesses represent critical points of failure in transitioning from a pilot project to a replicable, scalable model.

This study distinguishes itself by moving fundamentally beyond descriptive qualitative reporting. Prior literature often identifies such challenges but lacks the methodological precision to prioritize strategic action. The existing literature, while rich in context, is insufficient for evidence-based resource allocation because it has not yet provided a quantified strategic position (Priyadi, 2016).

Therefore, the primary objective of this research is to quantitatively determine the definitive strategic position of the Lumbung Mataraman green tourism model across the regencies of Gunungkidul, Bantul, and Kulon Progo. By rigorously quantifying the prominence (frequency and priority) of internal and external factors through the

Coding Frequency Weighted SWOT Analysis, this research aims to produce evidence-based strategic prescriptions (W-O Turnaround Model) for policymakers, thereby directing the optimal utilization of the Privilege Fund towards achieving long-term sustainability and replication. The novelty lies in this quantitative translation of rich qualitative data into actionable strategic coordinates.

## RESEARCH METHOD

### Research Design and Setting

This investigation employed a qualitative research approach to deeply explore the nuanced experiences, motivations, and contextual actions of participants (Lim, 2025). Data collection was geographically situated at the Lumbang Mataraman sites within Gunungkidul, Kulon Progo, and Bantul, as well as the coordinating body, the Yogyakarta Provincial Agriculture and Food Security Agency. This setting was crucial for obtaining empirical data reflective of the initiative's operational reality.

### Data Collection and Sampling

Primary data acquisition relied upon intensive observations and in-depth interviews with selected informants. The method of informant selection was purposive sampling, which ensured participants possessed specific knowledge relevant to the research objectives (Memon et al., 2025). Informants were stratified into three categories: key, main, and supporting (Nashrullah et al., 2023).

**Table 1.** Description of Informants

No	Informant Category	Informant Code	Position	Name of Regency
1	Key Informant	Key Informant 1	Farmer	Bendung, Gunungkidul, DIY
		Key Informant 2	Farmer and the first head of Srikandi Kelompok Wanita Tani (KWT) Bendung	
		Key Informant 3	Head of Kelompok Wanita Tani (KWT)/ Women Farmers Group, Srikandi Bendung	
		Key Informant 4	Bendung Head of Village	
		Key Informant 5	Head of Bendung Gabungan Kelompok Tani (Joint Farmers Group)	
2	Main Informant	Main Informant 1	State Civil Apparatus	Guwosari, Bantul, DIY
		Main Informant 2	Head of TPS3R Go-Sari	
		Main Informant 3	The Village Secretary	Gulurejo, Kulonprogo, DIY
		Main Informant 4	Gulurejo Head of Village	
		Main Informant 5	Head of Gulurejo Gabungan Kelompok Tani (GAPOKTAN)	
3	Supporting Informant	Supporting Informant 1	Head of Food Security of Yogyakarta Province	Yogyakarta Provincial Agriculture and Food Security Agency

### Data Verification (Trustworthiness)

To establish the trustworthiness and scientific rigour of the findings (Ahmed, 2024), three verification methods were systematically employed:

- **Source Triangulation:** Cross-validating information acquired from diverse informants and stakeholders.
- **Method Triangulation:** Comparing data acquired through different methods, such as validating interview statements against simultaneous field observations.
- **Time Triangulation:** Conducting observations or data examinations at various points in time to ensure consistency and mitigate temporal bias.

## Data Analysis Protocol

The collected qualitative data underwent a structured analysis process using the Miles and Huberman model, with NVivo 12 software providing essential tools for systematic data reduction and visualization (Abidin et al., 2023; Limna, 2023).

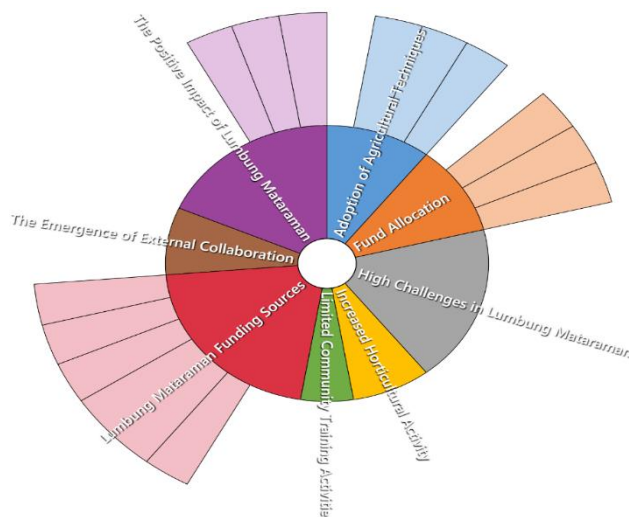
The key analytical stages were:

- **Data Collection:** Compiling all primary data (interviews, notes, documentation).
- **Data Reduction:** Systematically selecting, focusing, and abstracting data pertinent to the socio-economic themes of Lumbung Mataraman, followed by thematic coding using NVivo 12.
- **Visualization Diagram:** Presenting reduced data via visual outputs (e.g., sunburst charts, word clouds) to reveal thematic relationships and frequencies.
- **Data Analysis:** Interpreting visual and narrative data outputs through the lens of green tourism and tourism economics theory.
- **Quantitative Strategic Analysis:** The final stage, which involved the application of the Coding Frequency Weighting Method to the coded factors to determine the definitive strategic position.

## FINDINGS AND DISCUSSIONS

### Overview of Lumbung Mataraman

The Lumbung Mataraman model is fundamentally a village-level development strategy anchored in principles of food self-sufficiency (*Kalurahan Mandiri Pangan*), utilising Special Financial Assistance (*BKK*)/Privilege Fund support to bolster community welfare (Saraswati & Pratiwi, 2024; Yogyakarta Special Region Provincial Government, 2024; Danugroho, 2025). The strategy is realised through the empowerment of local institutions, notably the BUMKal (Village-Owned Enterprise) and GAPOKTAN (Combined Farmers Group), aiming to transform the area into a multi-sectoral green tourism destination that integrates economic activity with educational and ecological goals. The sunburst chart below illustrates the thematic structure of green tourism development linked to Lumbung Mataraman in Gunungkidul Regency .



**Figure 1.** Sunburst Chart Lumbung Mataraman in Gunungkidul

The core themes are 'Challenges of Lumbung Mataraman', 'Management of Goats' (as educational tourism, Hermawan et al., 2024), and 'Positive Impact of Lumbung Mataraman'. Other significant themes include 'Source of Funds', 'Leading Commodities' (shallots, cocoa, ginger, goats), and 'Technology Adoption'. These areas highlight the multi-sector integration (financing, business, environment, and participation) necessary for green tourism growth (Sugiharti et al., 2023).

The key findings, incorporating SWOT ratings based on participant priority and repetition, are:

### Potential (Opportunities/Strengths)

- **P1: Integration of Food Barns, Farming, and Recreation (S-4):** The model prioritises social interaction and a sustainable circular economy through integrated activities.

- **P2: Diverse Financial Support (S-3):** Funding comes from the Privilege Fund, Cooperative Office, Tourism Office, Women and Children Empowerment Office, and Farmer Group cash reserves (Lubis et al., 2025).
- **P3: Agro-educational Tourism Activities (S-3):** Training in digital technology, liquid fertiliser, and educational visits to biosaka, hydroponic, and petrogenon sites (Sousa et al., 2024; Thakur & Arora, 2022).
- **P4: Leading Commodities & MSME Products (S-2):** Shallots, cocoa, ginger, and goat farming, supplemented by processed products, strengthen the local economy.

#### Problems and Challenges (Weaknesses/Threats)

- **C1: Weak Regulatory Framework/Land Ownership (W-4):** Poor legal basis hinders community-based agricultural activities.
- **C2: Shortage of Trained Personnel (W-4):** Management teams need training in tourism services and promotion (Bodescu et al., 2024).
- **C3: Limited Competitiveness of Local Products (W-3):** Many goods face challenges in price and quality compared to market alternatives.
- **C4: Low Public Awareness of Farming Practices (W-2):** Discrepancy between tourism activities and the general public's knowledge of community-based farming.
- **C5: External Obstacles (e.g., Visitor Littering) (T-1):** (Supardi, interview May 10, 2025).

#### Development Strategy

- **S1: Gradual Development Plan:** Implemented through community training, facility upgrades, local economy stimulation, and establishing educational areas (Wijijayanti et al., 2025).
- **S2: Cross-Sectoral Cooperation:** Partnerships with relevant institutions, farmer groups, and MSMEs for education, promotion (Maryono et al., 2024), technical assistance, and funding.
- **S3: Strong Community Participation:** Engaging GAPOKTAN, millennial farmers, and women farmer groups, including profit-sharing and integrated waste management systems.

The word cloud reinforces these findings, highlighting 'lumbung', 'mataraman', and 'community' as core themes, with terms like 'cultivation', 'technology', 'hydroponics', and 'goats' representing key development areas.

#### Quantitative Strategic Analysis (SWOT)

The definitive strategic foundation of the model is ascertained via a quantitative SWOT analysis, using a methodology adapted from frequency-based weighting (as per the provided benchmark). This rigorous approach assigns quantifiable metrics to the qualitative data to determine the model's precise strategic coordinates (Amega et al., 2024).

#### Coding Frequency Weighting for IFAS and EFAS

The Rating Value (1-4) is determined by the thematic repetition and critical emphasis of each factor across the four research scopes (Gunungkidul, Bantul, Kulon Progo, and DIY Province), signifying the factor's perceived priority among stakeholders.

**Table 1.** Coding Frequency Weighting

Criteria for Weighting	Priority	Rating Value	Qualitative Interpretation
Most Dominant Involvement	Very High	4	Factor critically and consistently reported by 8-11 informants (spanning all four research scopes). This represents a systemic, cross-regional issue or strength.
High Involvement	High	3	Factor consistently mentioned by 5-7 informants (spanning 3 or 4 research scopes). This indicates a significant, shared priority among the majority of local and provincial stakeholders.
Moderate Involvement	Sufficient	2	Factor relevantly coded by 3-4 informants (spanning 2 or 3 research scopes). This represents an issue or potential specific to certain sites or informant groups.

Minimal Involvement	Low	1	Factor mentioned by 1-2 informants (spanning 1 or 2 research scopes). This is an isolated or highly localised concern/asset.
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### Recapitulation of Internal Factors (IFAS)

Internal analysis explores the inherent capabilities (Strengths) and systemic deficits (Weaknesses) under local control. The Total Score is an aggregation of qualitative priority ratings (S-4, W-4, etc.) identified in the field research.

**Table 2:** Weighted Scores of Internal Factors (IFAS)

No.	Internal Factor (Strengths & Weaknesses)	Total Score (Priority)	Weight (W)	Rating (1-4)	Weighted Score (W×R)
Strengths (S)					
S1	Strategic Location & Educational Tourism Potential	4	0.13	4	0.52
S2	Strong Community Group/Institutional Participation	4	0.13	4	0.52
S3	Diverse Financial/Privilege Fund Support (Internal Ops)	3	0.10	3	0.30
S4	Established BUMKAL/Economic Units (e.g., Waste Mgt.)	3	0.10	3	0.30
S5	Multi-Sectoral Integration (Agri-Livestock-Waste)	4	0.13	4	0.52
Total Strengths (S)		18	0.59		2.16
Weaknesses (W)					
W1	Shortage of Trained Personnel/HR Capacity	4	0.13	4	0.52
W2	Insufficient Infrastructure/Access (Physical & Digital)	4	0.13	4	0.52
W3	Low Product Competitiveness/Quality/Branding	4	0.13	4	0.52
W4	Limited Crop Diversification (Single-Commodity Reliance)	3	0.10	3	0.30
W5	Weak Regulatory Framework/Governance/Leadership	4	0.13	4	0.52
Total Weaknesses (W)		19	0.61		2.38
Total Final IFAS Score (X-axis)	WS - WW				-0.22

The calculated Total Final IFAS Score of -0.22 establishes that the internal weaknesses are quantitatively more potent than the internal strengths. The most critically weighted weaknesses (WS=0.52) are W1 (HR Capacity), W2 (Infrastructure), W3 (Product Competitiveness), and W5 (Governance), which are pervasive across the regions and pose the most significant systemic constraints on the model's operational efficiency and market readiness.

### Recapitulation of External Factors (EFAS)

External analysis addresses the Opportunities (O) and Threats (T) arising from the macro-environment, including policy, market forces, and climate risks.

**Table 3:** Weighted Scores of External Factors (EFAS)

No.	External Factor (Opportunities & Threats)	Total Score (Priority)	Weight (W)	Rating (1-4)	Weighted Score (W×R)
Opportunities (O)					
O1	Substantial Financial Backing (Privilege Fund/Danais)	4	0.20	4	0.80
O2	Demand for Green/Educational Tourism (Market Trend)	4	0.20	4	0.80

O3	External Collaboration (Academic/Government Partners)	3	0.15	3	0.45
O4	Utilisation of Circular Economy/Waste Management Tech	3	0.15	3	0.45
Total Opportunities (O)		14	0.70		2.50
Threats (T)					
T1	Technical & Production Failures (Soil/Water/Pests)	4	0.20	4	0.80
T2	Volatile/Stagnant Grant-Based Funding (Sustainability Risk)	3	0.15	3	0.45
T3	Distance/Competition from Major Tourist Destinations	2	0.10	2	0.20
T4	Severe Weather Conditions/Climate Change Impact	1	0.05	1	0.05
Total Threats (T)		10	0.50		1.50
Total Final EFAS Score (Y-axis)	WO - WT				1.00

The calculated Total Final EFAS Score of 1.00 confirms a profoundly favourable external environment. The opportunities provided by O1 (Financial Backing) and O2 (Market Demand) are the most leveraged strategic assets (WS=0.80). However, the high-weighted Threat T1 (Technical & Production Failures, WS=0.80) signifies a critical agricultural risk that directly undermines the food security component, despite the favourable external conditions.

### CONCLUSIONS AND STRATEGIC RECOMMENDATIONS

#### Quantitative Conclusion of Strategic Position

The synthesis of the IFAS and EFAS scores defines the strategic position:

Table 4. Final Strategic Coordinates

Factor	Final Score	Quadrant Position
Internal (IFAS)	-0.22	Left (X-axis)
External (EFAS)	1.00	Top (Y-axis)
Strategic Position	(-0.22 ; 1.00)	Quadrant II (Turnaround Strategy)

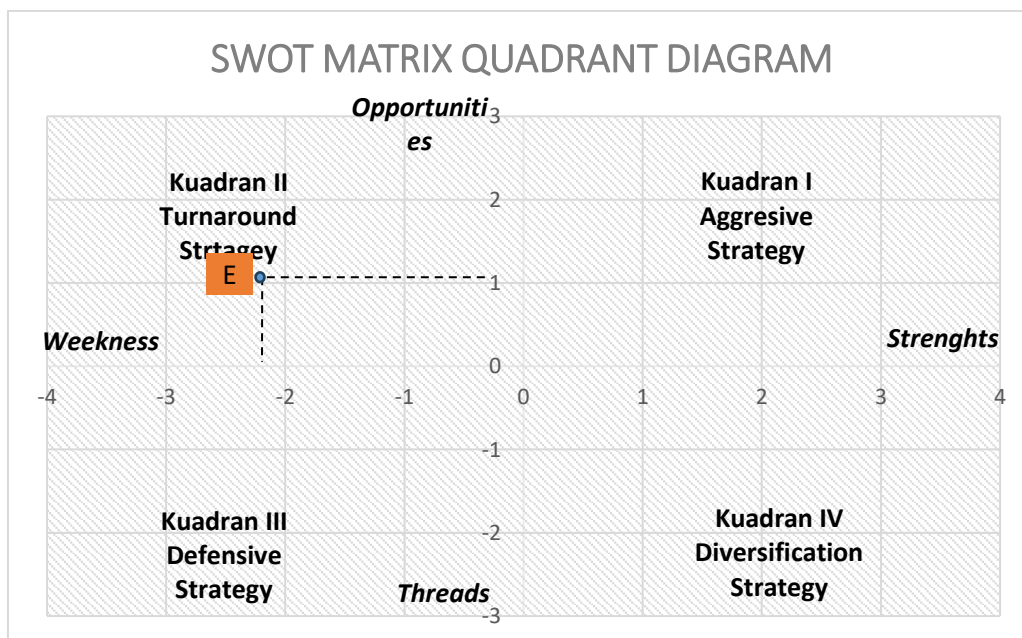


Figure 2. SWOT Matrix Quadrant Diagram

The calculated position in Quadrant II mandates an immediate Weakness-Opportunity (W-O) Strategy. This dictates that the model cannot pursue aggressive expansion (Quadrant I) until it successfully remediates its internal deficits (W) by strategically capitalizing on the immense external support and market pull (O). The priority is internal stabilization and capacity building.

### Strategic Recommendations (W-O Strategy)

The following high-impact strategies are formulated to address the dominant weaknesses (W1, W2, W3, W5) by leveraging the critical opportunities (O1, O2, O3).

**Table 5.** Strategic Recommendations (W-O Strategy)

Paired Factors	Strategic Prescription (W-O Strategy)
W1, W2, W3 + O1, O2	W-O 1: Capital Infusion for Human and Physical Capital: The provincial government must enact a policy directing the Privilege Fund (O1) towards two immediate, quantifiable objectives: a) establishing a certification program for local tourism guides and BUMKAL managers (addressing W1) and b) prioritising critical last-mile infrastructure investments, including digital access and basic sanitation at Lumbung sites (addressing W2), thus enabling the monetization of the educational tourism demand (O2) with quality service (W3).
W5 + O3	W-O 2: Institutionalisation through Collaborative Governance: Formalize Memorandums of Understanding (MoU) with universities and Ministry agencies (O3) to provide sustained technical assistance in developing transparent financial management systems and standardised operational procedures for BUMKAL/GAPOKTAN. This external validation is critical to mitigating the systemic risks posed by weak governance and volatile local leadership (W5).
W4 + O2 + T1	W-O 3: Agro-Ecological Diversification for Resilience: Mandate and fund comprehensive crop diversification programmes (W4) that move beyond the current reliance on longan/grape or single cereals. This strategy directly addresses the risk of production failures (T1) while simultaneously generating year-round, diverse agricultural products necessary to meet the continuous supply demands of educational and culinary tourism (O2), thereby enhancing food sovereignty and economic stability.

The Lumbung Mataraman model cannot adopt an Aggressive (S-O) strategy (Quadrant I) because its internal operational structure is too weak to handle large-scale expansion, potentially leading to immediate failure despite high investment. Similarly, it is not a Defensive (W-T) scenario (Quadrant IV) because the external environment is overwhelmingly positive.

Therefore, the W-O Turnaround Model is the only viable path, requiring a disciplined, inward-focused investment phase aimed at converting the current systemic weaknesses into robust internal strengths capable of sustaining future growth. The core recommendation is to use Privilege Fund money for human capital and infrastructure stabilization, not for superficial expansion.

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