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***Research paper***

# Ambidexterity: Green Innovation and Technology for Collaborative Dynamism in The Environment Preservation of The Tourism Village

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**Abstract**

This study aims to analyze the synergy of village economic development in Sudaji Village through implementing BUMDes management, village fund financial management, application of smart economics, and waste management. This study analyzed the synergy of village eco-nomic development as an endogenous variable and BUMDes management, village fund finances, application of smart economics, and waste management as exogenous variables. This type of research involves a quantitative description, and data collection is conducted through in-depthinterviews and questionnaires using a Likert scale. The population consists of the Sudaji Village government, Pokdarwis, BUMDes managers, and the Sudaji Village community, with a sample of 256 people. The research data were analyzed using Structural Equation Modeling. The results show a significant effect on the synergy of village economic development. In contrast, the BUMDes management variable and the smart economics variable yield different results; however, neither variable has a significant impact on the synergy of village economic development. The existence of tourist villages is one form of implementing sustainable tourism development through local community participation, ultimately aiming to improve community welfare.

***Keywords***: *BUMDes; Environmental Economics; Village Development; Waste Management.*

## 1. Introduction

The local government is currently intensively carrying out economic development in each village. This is because the regional autonomy policy given by the central government is intended to impact the development of a region or village (Berman, 2019). The authority obtained by the local government is then exercised by managing its region according to existing laws and regulations. Village management can be in the form of building a village by exploring the wealth of available resources. One of the efforts that the government can make to develop the village economy is to transform the town into a tourist destination. The tourist village program can be a platform for village communities to enhance their economic development. With tourism development objectives, tourist villages are formed to increase economic growth, improve social welfare, reduce unemployment, protect natural resources, and advance culture (Kachniewska, 2015). The formation of tourist villages can encourage social, cultural, and economic transformation, providing facilities that accelerate the development of villages. One of the villages that is now used as a model for a tourist village in Bali is Sudaji Village. This village is among the top 50 best tourist villages in the 2022 Indonesian Tourism Village Award (ADWI). Sudaji Village is a popular tourist destination in Sawan District, Buleleng Regency, Bali Province. The area of Sudaji Village is 1,834.55 hectares, covering Kaja Kangin Village, Ceblong, Kaja Kauh, Desa, Kubu Kili, Singkung, Rarangan, Mayungan, Bantas, and Dukuh, which are ten famous hamlets that form Sudaji Village (Kemenparekraf, 2023). Sudaji Village in Sawan District has considerable tourism potential. With sustainable development, this village has the potential to evolve into a significant destination that will further enhance its economy. Quality tourist visits also directly contribute to the economic growth of communities around tourist areas (Pulido Fernández & Cárdenas García, 2021).

**Table 1:** Key Tourism Data

| Tourist Arrival Data Sudaji | | | Tourism Products and Related Businesses | | | Number of Labor | | | |
|---|---|---|---|---|---|---|---|---|---|
| Year | Total Visi-tors | Overnight Vis-itors | Business and Product | Quantity | Total Room | Male | Female | Age (y.o.) | Explanation |
| 2020 | 2626 | 1197 | Homestay | 8 | 50 | 6 | 10 | >30 - <60 | The hosts manage most homestays. |
| 2021 | 2959 | 1240 | Food stalls | 8 | | | 8 | | No employee (self-managed) |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2022 | 2360 | 918 | Local transport (ojek) | 75 | 75 | | person |
| 2023 | 2794 | 894 | Souvenir shop | 1 | | 1 | Gegaen Lima Craft Accesso-ries (self-managed) |
| 2024 | 2630 | 1030 | Homestay | Total | 81 | 19 | |

Source: homestay guest stay data.

With the village's existence, the government is expected to continue implementing policies related to economic empowerment, which involves collecting and institutionalizing community economic activities. This has prompted the Sudaji village government to establish a financial institution fully managed by the village community, namely the Village-Owned Enterprise (BUMDes), one of the key programs aimed at increasing the village economy's independence. The BUMDes in Sudaji Village is called BUMDes Muncul Sari Aji. This BUM-Des encourages the village government to develop the potential of its village through the capabilities and authority of the town (Ikhwansyah et al., 2020) while as an instrument of community welfare, namely by involving the community in the management of BUMDes, and as a program designed by the government to improve the standard of living of the community. The position of the Village-Owned Enterprise (BUMDes) in driving the productive economy in the village should be in close synergy with the government to advance BUMDes (Nasfi et al., 2023). This synergy is essential for creating a conducive environment in which BUMDes can carry out their role as a driving force for a productive economy at the village level. This can be done by providing policy and regulatory support, resources and financial access, empowerment through training and mentoring, coordination and collaboration, monitoring and evaluation (Matsiliza, 2019).

Like most villages in Indonesia, the funds in Sudaji Village must be managed effectively to improve community welfare and encourage infrastructure development. This is also a manifestation of the government's commitment to utilizing tourism in economic growth, as the distribution of village funds can provide benefits in managing tourist villages, serving as a driver of the community's economy (Gao & Wu, 2017), particularly in Sudaji Village. With village funds, the local government can make decisions regarding finances closer to the village community. Village funds can be utilized as stimulus assistance to encourage the financing of village government programs that involve community self-help in carrying out government activities and community empowerment, thereby improving welfare and promoting equitable village development (Hutuely & Rumra, 2023). In managing the village fund finances, it is necessary to pay attention to and adhere to the general principles of village financial management, namely, village finances must be managed in an orderly manner, regulations, transparently, accountably, and participatory by paying attention to the principles of justice, propriety, and benefits for the village community (Adil, 2022).

Ambidexterity in an organization is achieved by balancing exploration and exploitation, enabling the organization to be both creative and adaptable while continuing to rely on more traditional and proven business methods. Exploration includes things like search, variation, risk-taking, experimentation, flexibility, discovery, and innovation (Yunita et al., 2023). The financial management of village funds and the formation of BUMDes in Sudaji Village, the existence of Smart Economics is an initiative aimed at improving community welfare through technological transformation, so that it can realize an innovation that can compete in various aspects by maximizing human resources, social media facilities, and collaboration through government, based on community participation (Kumar & Dahiya, 2017). An innovative economy (innovation and competition) is characterized by an increasing number of improved innovations, which will increase new business opportunities and market competition (Caragliu & Bo, 2019). The manifestation of an innovative economy occurs when a village can utilize the development of information technology to enhance its economic activities. One of the benefits of a creative economy is that it makes it easier to create a promotion. Sudaji village is a tourist destination that requires promotion to introduce it to both domestic and foreign tourists, so it needs direction to adapt and utilize digital transformation optimally. This can be more prospective and even increase income compared to not implementing smart economics (Fuady et al., 2022).

Developing a village is not only about the economy but also requires environmental synergy. Waste has always been one of the problems that the community must face. Community activities, including those in the village, cannot be separated from activities that produce waste or garbage, both organic and non-organic waste (Chazanah & Nandiyanto, 2022). Handling this waste can be achieved by managing it to maintain the environment's aesthetics and reduce the threat of various diseases. This drives Sudaji Village to establish a Waste Management Site (WMS) based on the Reduce, Reuse, Recycle (3R) principle. TPS3R is a waste management system and technology to overcome the waste problem and its impacts (Aprilia et al., 2024). Through TPS3R, environmental pollution caused by waste can be reduced, and products of economic value can be produced from processed waste.

Although Sudaji Village has now become one of the pilot villages in Buleleng Regency with the implementation as a tourist village that has been realized, there are still difficulties in fulfilling the needs as explained above, so some people cannot adapt to the development of Sudaji Village. This causes several problems in the community environment, such as the lack of concern of some people towards the existence of tourists, the lack of socialization regarding the rules regarding tourist villages by the local government so that there is no economic impact from tourism activities in Sudaji Village to the village government, the high sectoral ego of each stakeholder, and the lack of attention from the local government are also obstacles in efforts to continue to develop Sudaji Village into a Tourist Village. Therefore, this study was conducted to identify how Sudaji Village has implemented its management based on BUMDes, village fund finances, the application of smart economics, and waste management.

## 2. Literature review and hypotheses development

Development in a village is an effort by the community and government to utilize available resources, government assistance, and support from other organizations to create positive changes. Building a village economy can make the village independent. Village communities can thrive, and village governments can provide essential services and drive the village economy. Rural economic development is a process in which the village government and the community manage existing resources and form a partnership pattern between the village government and the private sector to create new jobs and stimulate the development of economic activities (growth) in the area (Aulya et al., 2016). The concept of village economic development must focus on the strengths of the village community. The potential of natural and human resources in the village must be a source of strength in building the village economy. Programs between the center and provincial, district, or city governments must synergize and address the village's needs (Sofyan et al., 2024). This means that rural development must address the problems faced and promote community participation by utilizing the necessary resources to design and build upon the existing economy, thereby leveraging its economic potential to further improve community welfare.

Village-owned enterprises, often referred to as BUMDes, are village business institutions managed by the community and the government to strengthen the village economy. BUMDes as a village business institution is mandated in Village Law No. 6 of 2014 and stipulated

through the Regulation of the Minister of Villages, Permendes No. 4 of 2015. This policy provides a legal framework for BUMDes as a village economic institution to manage and maximize the village's potential to improve village communities' welfare and economic independence (Kania et al., 2021). The establishment of Village-Owned Enterprises (BUMDes) aims to develop the local economy in a village. This regional economic development is based on the needs, potential, capacity, and capital participation of the village government in the form of financing and village wealth, with the ultimate goal of improving the economic level of the community (Winarsi et al., 2018). So the characteristics of BUMDes are: 1) owned and managed by the village, 2) Business capital and working capital come from village funds (51%) and the community (49%) by acting as financiers, 3) Management is based on local wisdom, 4) Profits obtained are used to develop community and village businesses, 5) Engaged in business sectors that pay attention to village advantages and market information, 6) Both central and regional governments facilitate its existence. 7) Supervision is carried out jointly by the Village Government, BPD, and members (Muis et al., 2022). BUMDes can be used as a forum for village communities to empower themselves and become independent of the village, leveraging various village potentials. BUMDes can be established as a regional development agent and become a driver for the creation of a corporate sector in rural areas, provided that production and management costs are not too high. BUMDES has three roles: providing or improving public services for local communities, utilizing village assets, and supporting community production efforts (Widyastuti & Kusumawati, 2024).

Based on Government Regulation Number 8 of 2016, the definition of village funds is funds allocated for villages and sourced from the APBN, which are transferred through the APBD (Regional Revenue and Expenditure Budget) of the district/city to finance the needs of organizing village governance, such as implementing development to empower village communities (BPK, 2023). The provision of village funds manifests the fulfillment of the village's right to organize regional autonomy to grow and develop. Village funds are managed in an orderly manner, by the provisions of laws and regulations, efficiently, economically, effectively, transparently, and responsibly, by paying attention to a sense of justice and propriety, and prioritizing the interests of the local village community (Budiana et al., 2019). Village Funds are prioritized to finance development and community empowerment, thereby improving the welfare of village communities, enhancing the quality of human life, and alleviating poverty. It is stated in the Village Government Work Plan (Udjianto et al., 2021). The Village Fund Allocation received by the village government is 30% used for operational costs, including financing village operations, BPD operational costs, and the operational costs of the village fund allocation organizing team. Meanwhile, 70% of village funds are used for community empowerment in the development of village economic facilities and infrastructure, empowerment in the fields of education, health, community economic empowerment, especially to eradicate poverty, and financial assistance for heads of village community institutions, BUMDes, business groups according to the economic potential of the village community, as well as financial assistance to institutions in the village such as LPMD, RT, RW, PKK, Karang Taruna, Linmas (Ernawati et al., 2021).

Smart Economics is one of the dimensions of a smart city. An innovative economy is characterized by the use of information and communication technology in all economic activities(Al Sharif & Pokharel, 2022). This means there is effective and efficient ongoing support for economic growth, which improves people's welfare. Smart economics, in its implementation, greatly encourages various forms of digitalization development related to the economy, such as online shopping services and transactions using electronic money (Shkarlet et al., 2020). Smart economics can contribute to economic development by combining digital technology with the economy to create efficiency, encourage innovation, and facilitate sustainable economic development (Yin et al., 2024). Utilizing technological innovation and promoting a village, especially a tourist village, can be crucial in driving economic growth. Technological innovation can create opportunities, increase efficiency, and encourage sustainable economic development. A smart economy (innovation and competition) is characterized by improved innovations, increasing new business opportunities, and competition in the business or capital market (Krammer, 2017).

Waste has become a national problem, so its management must be carried out comprehensively and in an integrated manner to provide economic benefits, promote community health, ensure environmental safety, and change people's behavior. Household waste is a byproduct of daily human activities; if not managed properly, it can lead to increased waste piles. To deal with the waste problem, we cannot only rely on the local government, but there also needs to be participation from the community, organizations, and private parties to work together and contribute to solving the waste problem (Sinthumule & Mkumbuzi, 2019).

Waste management includes various aspects such as waste collection, processing, and disposal (Das et al., 2019). Some practices that can be applied are that the community is taught to separate organic and inorganic waste, where organic waste can be composted, while inorganic waste can be recycled (Rachman et al., 2020). Implement a management system that involves the community in collecting and processing waste. Education programs and environmental campaigns increase public awareness of the importance of good waste management. Involve the private sector or non-governmental organizations to manage waste, provide recycling facilities, and ensure efficient trash bins and facilities for waste processing, such as waste banks. Technology can be used in waste processing, such as making biogas from organic waste. By following these steps, waste management will become more effective and sustainable.

The formation of BUMDES was a means for the village government to develop human resources that would be more active and creative. Creating new business opportunities to provide economic growth and generate new jobs for the community. BUMDes is expected to be the driving force of the economy in rural areas by managing village economic assets collectively by the community. The spirit of cooperation and self-reliance must strengthen the principles and essence of BUMDes to enhance their economic dimension (Sulistyorini et al., 2023). In this phase, BUMDes will actively increase the village's original income and advance community economic activities, serving as the primary entity that coordinates these efforts. A study by Badaruddin et al. (2017) highlighted the role of institutions such as Village-Owned Enterprises (BUMDes) in strengthening the village economy. Meanwhile, Tosida et al. (2022) examined village digitalization through a participatory approach. In the context of the smart economy, most studies (e.g., Fauzi & Mahyuni, 2021) have focused more on smart cities than smart villages, creating a gap in adapting this concept to rural contexts, particularly tourism villages with distinct social and infrastructure characteristics. Research by Purnamawati et al. (2024) emphasizes the importance of locally-based digital tourism as a strategy to strengthen the competitiveness of tourist villages. In their study of several tourist villages in Bali, they found that the use of digital platforms (such as Instagram, Google My Business, and local marketplaces) significantly increased the visibility and attractiveness of destinations.

The existence of BUMDES is considered to be an increase in community efforts in managing the economic potential of the village (Malik et al., 2021), (Maddatuang et al., 2021) The village's potential that has not been utilized so far can be facilitated through BUMDES. Access to capital loans from BUMDES units opens up opportunities for the community to enhance its economic growth. BUMDes, a social institution, aims to provide community rights or interests in delivering social services. While in commercial institutions, BUMDes is an institution that provides benefits by offering local resources. BUMDes, as one of the partners of the village government in realizing economic development plans, is required to provide for the community's needs in developing businesses (Sara et al., 2020).

$H_1$: BUMDES Management Affects Village Economic Development Synergy.

Village development, of course, has its priorities. These priorities complement each other as much as possible, aligning village development objectives with priority policies for utilizing village funds. A village fund budget will accelerate distribution or access in villages, overcoming problems that can be slowly resolved, especially regarding public infrastructure development, because the budget distribution is carried out fairly and evenly (Faoziyah & Salim, 2020). The village government hopes that the existence of village funds will increase community income. The success of village fund management will be directly proportional to the success of village economic development (Sutiyono et al., 2018) and (Antlöv et al., 2016)Village development can be used to support the running of the village government, which can revive various sectors and activities of village communities that are more independent and advanced. However, the management of village funds in a village has not all been carried out optimally; research conducted states that village funds are not evenly distributed, so that not all people can enjoy them, which causes the needs and welfare of the community to not be met (Karlan et al., 2014). In addition, several challenges in managing village funds, such as unbalanced distribution of village funds, slow implementation, and suboptimal supervision, indicate the lack of organizational and human resource readiness in the policy implementation process, so that there is still often a gap between rural and urban areas (Nurlinah et al., 2020).

$H_2$: Village Fund Finance Affects Village Economic Development Synergy

Smart economics is the development of economic governance that can face challenges and changes. Smart economics can contribute to economic growth by enhancing people's welfare, improving workforce absorption, competitiveness, and productivity, as well as enhancing citizens' quality of life and financial literacy. According to research (Popkova et al., 2022)Smart economics in developing countries forms economic growth with new attributes. Digitalization in the financial sector increases purchasing power, improves health, reduces inflation, and reduces travel time through the development of the online economy. The economic growth achieved can reduce people's living costs (Popkova et al., 2021). An innovative economy manifests when villages can utilize developments in information technology to increase their economic activities (Somwanshi et al., 2016).

$H_3$: Smart Economics Affects Village Economic Development Synergy

Waste management can contribute to village economic development by opening up new sources of income where people can get new income from the sale of waste that is processed into products with sales value (Budihardjo et al., 2022) and (Jayasinghe et al., 2021). Additionally, it can also help meet needs where income from waste sales can assist people in fulfilling their needs. An efficient waste management system has the potential to stimulate economic growth and create jobs. The expansion of recycling programs and the development of recycling infrastructure can lead to the creation of new businesses and industries, providing more job opportunities (Conke, 2018). Additionally, the recycling sector contributes to the local economy by selling and exporting recycled materials, thereby supporting domestic industry and trade. This means that by investing in efficient waste management practices, the government can foster economic development, boost local employment rates, and cultivate an environmentally friendly and sustainable workforce.

$H_4$: Waste Management Affects Village Economic Development Synergy

## 3. Data and methodology

The research was conducted in Sudaji Village, which was chosen as the location because it has become a thriving tourist village, renowned for its natural beauty and culture. This study uses a quantitative descriptive approach. Data were collected using a questionnaire distributed via a Likert scale (1-5) with 256 respondents selected, including representatives from the Sudaji Village government, Pokdarwis, BUMDes managers, and the Sudaji Village community. The data analysis model in this study uses SEM-PLS. Primary data was analyzed using WarpPLS Ver 7 software. For secondary data, relevant literature and reports from the Sudaji Village government were used. The identities of the informants in this study were kept confidential to ensure their peace of mind when providing information about the research.

This research analyzes (1) the influence of BUMDes management on village economic development synergy, (2) the influence of village fund finance on village economic development synergy, (3) the influence of smart economics on village economic development synergy, and (4) the influence of waste management on village economic development synergy.

**Table 2:** Summary of Sample Presentation

| Criteria of questionnaires | Total observations |
|---|---|
| Distributed | 260 |
| Un-returned | 4 |
| Returned | 256 |
| Un-processed | 0 |
| Processed | 256 |

**Table 3:** Definition of Variables and Data Sources

| Variable | Definition | Indicator |
|---|---|---|
| Village Economic Development Synergy (Y) | Cooperation between the village government, the community, and the private sector to develop the rural economy. This synergy can create jobs, increase community income, and reduce economic disparity by utilizing existing resources (Rodríguez-Pose & Hardy, 2015) | 1. Collaboration<br>2. Legitimacy<br>3. Regulation<br>4. Community Participation |
| BUMDes Management (X1) | The Village Government manages the village business and has legal status. The Village Government can establish BUMDes according to the needs and potential of the Village (Sutrisno & Permana, 2024) | 1. Village Potential<br>2. Governance<br>3. BUMDes Programs<br>4. Effectiveness<br>5. Constraints |
| Village Funds (X2) | Funds sourced from the State Revenue and Expenditure Budget (APBN) allocated for Villages are transferred through the Regency or City Regional Revenue and Expenditure Budget (APBD) and used to finance the implementation of government, implementation of development, community development, and community empowerment (Agus et al., 2023) | 1. Planning<br>2. Implementation<br>3. Reporting<br>4. Accountability |
| Smart Economics (X3) | A concept that combines digital technology with the economy to create efficiency, innovation, and sustainable growth (Apostol et al., 2015) | 1. Internal and External Factors<br>2. Strengths (S)<br>3. Opportunities (O)<br>4. Weaknesses (W) |

| | | |
|---|---|---|
| Waste Management (X4) | Activities to manage waste from the beginning to disposal, including collection, transportation, processing, and disposal, as well as monitoring and regulation (Zorpas, 2020) | 1. Reduce<br>2. Reuse<br>3. Recycle<br>4. Disposal |

Research model:

$$\eta = \eta\beta + \xi\Gamma + \beta_1\xi_1 + \beta_2\xi_2 + \beta_3\xi_3 + \beta_4\xi_4 + \varepsilon$$

Information

$\eta$ = Village Economic Development Synergy (DS)
$\eta\beta$ = Coefficient matrix of endogenous variables
$\xi\Gamma$ = Coefficient matrix of exogenous variables
$\beta_1\xi_1$ = BUMDes Management (BM)
$\beta_2\xi_2$ = Village Fund (VF)
$\beta_3\xi_3$ = Smart Economics (SE)
$\beta_4\xi_4$ = Waste Management (WM)
$\varepsilon$ = error disturbance (confounding variable)

## 4. Results and discussion

The WarpPLS 7.0 structural equation model is used as a data analysis technique in research. The outer and inner model tests prove the large or small influence of the path coefficient of an exogenous variable on an endogenous variable (Kock, 2020). The outer model tests the validity and reliability of a research instrument. The validity test in the outer model is measured using the convergent validity and discriminant validity instruments (Wong, 2013) Convergent validity refers to the correlation between the reflective indicator score and the corresponding latent variable score. If the loading value is ≥ 0.6, this validity meets the criteria.

**Table 4:** Convergent Validity

| Variable | Indicator | BM | VF | SE | WM | DS | P Value |
|---|---|---|---|---|---|---|---|
| BM** | BM.1 | 0.821 | | | | | |
| | BM.2 | 0.894 | | | | | |
| | BM.3 | 0.938 | | | | | |
| | BM.4 | 0.896 | | | | | |
| VF** | VF.1 | | 0.923 | | | | |
| | VF.2 | | 0.912 | | | | |
| | VF.3 | | 0.931 | | | | |
| SE** | SE.1 | | | 0.864 | | | |
| | SE.2 | | | 0.944 | | | |
| | SE.3 | | | 0.894 | | | <0.001* |
| | SE.4 | | | 0.812 | | | |
| WM** | WM.1 | | | | 0.877 | | |
| | WM.2 | | | | 0.889 | | |
| | WM.3 | | | | 0.871 | | |
| DS** | DS1 | | | | | 0.853 | |
| | DS2 | | | | | 0.881 | |
| | DS3 | | | | | 0.862 | |
| | DS4 | | | | | 0.835 | |
| | DS5 | | | | | 0.840 | |

Source: processed data (pvalue <0.001* = Valid**).

Table 4 shows that the combined loadings and cross-loadings in the convergent validity test have a loading value of ≥ 0.6, indicating that the criteria are met and thus validity is established. Discriminant validity as a measurement of reflective indicators based on cross-loading with its latent variables (Roldán & Sánchez-Franco, 2012) Table 5 shows that the AVE value of each variable is acceptable.

**Table 5:** Discriminant Validity

| | Correlations among l.vs. With sq. rts. of AVEs | | | | |
|---|---|---|---|---|---|
| | BM | VF | SE | WM | DS |
| BM | 0.788* | | | | |
| VF | | 0.922 | | | |
| SE | | | 0.757* | | |
| WM | | | | 0.879* | |
| DS | | | | | 0.833* |

Source: processed data.

The validity and reliability are also measured using composite reliability and Cronbach's alpha. (Mohajan, 2017) Composite reliability measures the stability and consistency of combined reliability measurements. The questionnaire has high composite reliability if the composite reliability value is 0.8 or higher. At the same time, Cronbach's alpha on each variable must be above 0.6 to accept the internal consistency reliability. In Table 5, the composite reliability value of each variable exceeds 0.7, and the Cronbach's alpha value of each variable exceeds 0.6. Therefore, it can be concluded that all variables have met the reliability criteria.

**Table 6:** Latent Variable Coefficients

| | BM | VF | SE | WM | DS |
|---|---|---|---|---|---|
| Coefficients: | | | | | |
| R-squared | | | | | 0,800 |
| Adjusted R-squared | | | | | 0,797 |
| Composite reliability | 0,828 | 0,944 | 0,783 | 0,911 | 0,901 |
| Cronbach's alpha | 0,697 | 0,911 | 0,612 | 0,853 | 0,835 |
| Average variances extracted | 0,621 | 0,850 | 0,672 | 0,773 | 0,695 |
| Full collinearity VIFs | 1,571 | 1,164 | 1,051 | 1,992 | 2,499 |
| Q-squared | | | | | 0,735 |

Source: processed data.

Furthermore, as shown in Table 6, the study yields an R-square of 0.800, indicating that 80% of the synergy in village economic development can be attributed to four variables: BUMDes management, village fund finance, smart economics, and waste management. In comparison, other variables influence the remaining 20%. In the full collinearity VIFs value as a result of the full collinearity test, which includes vertical and lateral multicollinearity, the criteria must be minor from (<3.3) so that the model can be declared free from vertical collinearity problems and standard method bias occurs, the output results show a value smaller than (<3.3) then the full collinearity VIFs value is accepted and in the measurement of Q-square coefficients used as an assessment of predictive validity which can be damaging and more significant than (> 0), the results of the study showed a value greater than (> 0) so that it was declared valid.
The research is declared good if the structural model meets the required standards (Kock, 2015). Table 7 contains test items and standard inner model test values used to measure the model's strength.

**Table 7:** Model Fit and Quality Indices

| Model Fit and Quality Indices | Fit Criteria | Indeks |
|---|---|---|
| Average: | | |
| path coefficient | | 0,559* |
| R-squared | p < 0.05 | 0,800* |
| adjusted R-squared | | 0,797* |
| block VIF | acceptable if <= 5, ideally <= 3.3 | 2,773* |
| full collinearity VIF | | 2,180* |
| Tenenhaus GoF | small >= 0.1, medium >= 0.25, large >= 0.36 | 0,749** |
| Ratio: | | |
| Sympson's paradox | acceptable if >= 0.7, ideally = 1 | 0,849* |
| R-squared contribution | acceptable if >= 0.9, ideally = 1 | 0,993* |
| Statistical suppression | acceptable if >= 0.7 | 1,000* |
| Nonlinear bivariate causality direction | | 0,975* |

Source: processed data.
*) = Fulfilled
**) = Fulfilled, large category

The output results presented in Table 7 indicate that the fit and quality indices for all criterion values meet the requirements, making the structural model acceptable and suitable for analysis. The output results from Table 8 and Figure 1, in the form of path coefficient values, are used to determine the magnitude of the direct relationship's influence. The path coefficient value of BM, VF, SE, and WM towards DS:

1) BM= 0.046, p-value is 0.228 > significance level 0.05. It is stated that BUMDes management does not significantly affect the village's economic development synergy.
2) VF= 0.456, p-value is 0.001 < significance level 0.05. The Village Fund's finances significantly affect the village's economic development synergy.
3) SE= 0.066, p-value is 0.143 > significance level 0.05. Smart economics does not significantly impact the village's economic development synergy.
4) WM= 0.467, p-value is 0.001 < significance level 0.05. Waste management has a significant impact on the village's economic development synergy.

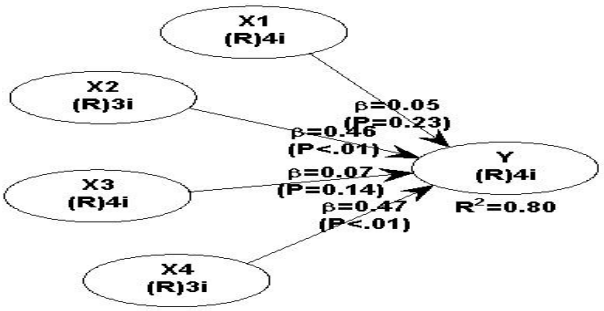


**Fig. 1:** Results of the Direct Effect Analysis Test.

**Table 8:** Path Coefficients and P-Values

| Variable | Criteria<br>Path coefficients | P Values |
|---|---|---|
| BM | 0,046 | 0,228 |
| VF | 0,456 | < 0,001 |
| SE | 0,066 | 0,143 |
| WM | 0,467 | < 0,001 |

Hypothesis testing decision: obtained p-value ≤ 0.10 then weakly significant, p-value ≤ 0.05 then significant, and p-value ≤ 0.01 then highly significant***.

The study's results above indicate that the first hypothesis is rejected, meaning that the influence of BUMDes management does not significantly impact the synergy of village economic development. Research conducted by Syafitri (2019) showed that BUMDes management still experiences obstacles due to minimal community involvement and a lack of communication between stakeholders and all parties involved, resulting in less than optimal improvement of the regional economy. This is also supported by the statement of the Head of Sudaji Village, who notes that an appropriate economic impact does not accompany the superior potential and achievements of Sudaji Tourism Village for its people. Amid achievements and potential that should be proud of, it turns out that the original regional income (PAD) generated from tourism village activities has not become the primary income compared to other sectors in the village, as evidenced by the original regional income from BUMDes Sudaji Village for the last 3 years by the Sudaji Village Government that income only comes from BUMDes profit sharing. This means no synergy exists between the government and the community as business actors in tourism villages. It is also said that many homestay managers are still not under the auspices of BUMDes, so there is still a high sense of ego in creating synergy in village economic development. Several factors can cause the insignificance of BUMDes management to village economic development: a) Conflicts between stakeholders within the BUMDes structure, such as between village officials, BUMDes managers, and community groups, often hinder decision-making and accountability. According to Badaruddin et al. (2017), one of the main challenges in BUMDes management is weak coordination and lack of synergy between the parties involved, which ultimately hinders the effectiveness of village economic programs; b) Limited managerial capacity, including a lack of training in entrepreneurship, financial management, and village business innovation, also hinders the optimization of the role of BUMDes; c) Lack of utilization of digital technology in BUMDes business processes, so that management is still conventional and less adaptive to market dynamics and tourist needs. These findings confirm that the application of ambidexterity in the context of tourism villages, specifically the exploitation of existing systems (village-owned enterprises and community participation), does not have a direct and significant impact without the support of human resource readiness and inclusive governance.

Furthermore, the second hypothesis shows different results when the second hypothesis is accepted, namely, the influence of village fund finances has a significant effect on the synergy of village economic development, which is supported by research (Palisuri et al., 2024); (Saepudin & Yusuf, 2022); (Karim & Syamsuddin, 2024); (Bustomi et al., 2020); (Arham & Payu, 2019) and (Zhu et al., 2022) stated that the funds allocated for the village have been earmarked, and development and empowerment have been carried out fairly. As with the available village funds, they have been managed and appropriately distributed by the local government in Sudaji Village. In implementing village funds in Sudaji Village, the government conducted socialization sessions regarding the management of village funds with village officials, the Village Consultative Body, and lower-level organizations within the village. Then, direct distribution of BLT Village Funds by the Sudaji Village Head and Village Apparatus to the community in need, and monitoring the management of village funds by the entire village community to prevent fraud by village officials or those directly involved. This means that the village funds in Sudaji village have a positive impact. Overall, village funds have been utilized to alleviate poverty and reduce inequality, ultimately increasing the income of villages and communities. Village funds are also used to improve planning and budgeting for development at the village level, contributing to community empowerment, as evidenced by the increasingly positive development of tourist villages.

Then, the study results from the third hypothesis showed that this hypothesis was rejected, which means that the smart economics variable does not significantly affect the synergy of village economic development. This is based on research conducted by (Tosida et al., 2022) and (Wahyuni et al., 2022). Smart economics is a concept that leverages technology to drive innovation and enhance economic competitiveness. An innovative economy is one dimension of a smart city, a city concept that integrates government services and infrastructure with citizens. The Buleleng regional government has promoted smart cities and innovative economies, and Sudaji Village is preparing to join this movement. One of the steps taken is to create the sudajitourism.com domain to promote Sudaji Village as a tourist destination. This means that in Sudaji Village, the government coordinates the implementation of the program for the Sudaji village community, but its implementation has not been optimal. This is due to the lack of coordination and communication between the Sudaji Village apparatus and the Sudaji Tourism Village managers, making it challenging to design a promotional strategy that incorporates smart economics. A well-defined promotional strategy is essential for Sudaji Tourism Village to enhance the quality of tourist visits, thereby positively impacting the village's economic development (Purnamawati et al., 2024). However, its implementation in tourist villages is often hampered by: a) Low digital literacy among village communities, which limits the use of technology, such as digital marketing, electronic payment systems, and location-based tourism applications. In line with the findings of Tosida et al. (2022), many tourist villages have not been able to adopt a comprehensive digital economy system due to limited human resources, digital infrastructure, and minimal technological assistance; b) Limited access to Information and Communication Technology infrastructure, such as stable internet and digital devices, which are the main prerequisites for developing an innovative economy ecosystem. c) Lack of awareness of the potential of data and digital innovation in supporting sustainable tourism, so that the strategies implemented are still traditional and not integrated into the smart tourism system. Therefore, digital training and technology facilitation are crucial.

The results of the last study or the fourth hypothesis show that the waste management variable has a significant effect on the synergy of village economic development, which is supported by research (Salmon, 2023); (Wulandari et al., 2017) and (Purba et al., 2014) The existence of a waste management model is not only beneficial in keeping the environment clean but also has a positive impact on the local economy by increasing the income of homemakers through the establishment of a waste bank. This is achieved through the implementation carried out by the government and the people of Sudaji Village, who utilize TPS3R technology, specifically a waste processing system featuring innovative waste shredding and compost sieving machine technology that is more effective and efficient. The results of organic waste processing in compost are used for ornamental plant fertilizer and sold to the community or collectors. In addition, to improve the quality of composting results, worm compost technology will be applied. TPS3R Sudaji Village was established through the initiative of the Sudaji Village community, which recognizes the importance of waste management. This TPS3R was built using self-help funds by the Kelompok Sadar Wisata (Pokdarwis) of Sudaji Village. Currently, TPS3R Sudaji Village already has a plastic pressing machine, an organic waste shredding machine, and a compost processing machine, all of which were provided by the Ministry of Tourism of the Republic of Indonesia.


**Fig. 2:** Village Economic Development.

Figure 2 illustrates the activities of the Sudaji Village community in producing and utilizing Eco Enzyme as an innovative method for managing organic waste. This practice is not only part of an integrated waste management system but also a concrete form of sustainable community-based tourism. Eco Enzyme production is carried out collectively by residents, housewives, Pokdarwis (Tourism Awareness Groups), and BUMDes managers. This activity demonstrates the level of active community participation in maintaining the cleanliness of the tourism village environment. The practice of waste management through Eco Enzyme production in Sudaji Village is a concrete example of the synergy between simple technological innovation, community empowerment, and digital marketing strategies. This approach demonstrates that community involvement in environmental management can be an integral part of the tourism experience, while strengthening the position of tourism villages as models of sustainable development.

## 5. Conclusion

The existence of tourist villages is one form of implementing sustainable tourism development through local community participation, ultimately aiming to improve community welfare. An ideal tourist village can fulfill three key aspects: guaranteeing environmental sustainability, involving the community in its development, and enhancing the community's economic quality of life. Developing tourist villages prioritizes giving villages sufficient authority to establish themselves in tourism creatively and independently. The involvement of the community and stakeholders fosters a sense of ownership and responsibility towards the town, encompassing its economy, society, and environment. Community involvement in Sudaji Village significantly contributes to local economic empowerment. Therefore, there is a need for collective awareness of the importance of cooperation and business continuity, as well as the avoidance of potential internal conflicts, to increase the sustainability of BUMDes management programs. In addition, by utilizing technology, Sudaji Village can enhance the welfare of its citizens, protect the environment, and become a hub of new economic growth. So, careful planning, support from various parties, and community readiness are needed to adapt to change. The limitations of this study lie in the variables used. It is still not optimal to show its role in the synergy of village economic development. In addition, the study was limited to the tourist village area, specifically Sudaji Village, Bali Province, and therefore does not represent all tourist areas in Indonesia. This research is limited in terms of geographic scope, as it focuses solely on Sudaji Village as a case study. While the findings offer in-depth insights into the factors influencing the synergy of village tourism economic development through innovation, green technology, and community collaboration, the generalizability of these findings remains limited to the specific local social, cultural, and institutional context. Therefore, the application of these findings to other tourist villages requires considering variations in local conditions, including: a) Level of digital readiness and technological infrastructure; b) The institutional capacity of the village and BUMDes; c) Collaborative social and cultural capital of the local community; d) Access to training and technical assistance. To strengthen the external validity and increase the generalizability of the research results, further studies covering several tourist villages across Indonesia are highly recommended. These multi-village studies can compare the dynamics of economic and environmental synergy in different contexts and identify common patterns as well as variations driven by local factors. This approach will also enable broader and more adaptive policy mapping for innovation- and sustainability-based village tourism development at the national level. However, there is potential for expansion into aspects not yet covered in this study, including: 1) Tourist Satisfaction, which will directly influence: the rate of repeat visitors, Word-of-mouth-digital reviews, and the economic sustainability of the tourism sector. Including this variable will open insights into how tourist experiences interact with the quality of service, cleanliness, cultural authenticity, and digital facilities available in tourism villages. 2) Cultural Preservation. As part of social and symbolic capital, it plays a crucial role in strengthening the identity of tourism villages and enhancing the attractiveness of destinations that modern alternatives cannot replicate. 3) External environmental variables such as regional tourism policies and global digitalization trends. Methodologies such as mini-ethnographies or phenomenological studies can be used to capture local narratives, experiences, and values that influence acceptance of innovation. Qualitative studies, particularly those employing in-depth interviews and focus group discussions (FGDs), are well-suited to contextually exploring these dynamics.

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