

# Utilizations and policy formulations of home garden (*pekarangan*) as agritourism area in East Java, Indonesia

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**Abstract.** *Trisananto A, Soekmadi R, Arifin HS, Pramudya B. 2023. Utilizations and policy formulations of home garden (pekarangan) as agritourism area in East Java. Biodiversitas 24: 1450-1459.* This study aims to determine the factors that play a role in successfully using a home garden (*pekarangan*) as an agritourism area. This is important as material for formulating designs for home gardens for sustainable agritourism areas. This research was conducted in Banyuwangi District, East Java Province. The data and information to develop a home garden utilization system were collected through field observations and interviews with relevant parties. This study uses Interpretive Structural Modeling (ISM) analysis to identify the determinants and develop design formulations for utilizing *pekarangan* for agritourism areas. The key elements of a system are generated from the interpretation of ISM analysis data, which shows the levels of system structure. ISM analysis was determined through an approach with five criteria to examine the binding strength within and between groups/levels, the relative frequency of oscillations/shocks, context, coverage (containment), and functional relationship, respectively. The results showed that management institutions need to develop financing schemes with financing institutions, both banks and non-banks, based on financial technology (fintech). As practical implications, affordable financing for farmers/providers of tourism products, with their aggregator avalists, is needed to improve the financial capacity of community-based tourism. The manager of the *pekarangan* agritourism area is an aggregator of regional business processes by building inter-village networks and connectivity to major tourist destinations. Thus, home garden-based agritourism is expected to create new tourism area units networked with the main tourist destinations to form network tourism destinations.

**Keywords:** Aggregator, agritourism, home garden (*pekarangan*), interpretive structural modeling

## INTRODUCTION

Home gardens have vital functions for various kinds of home interests. Apart from supporting household food security (Ferdous et al. 2016; Castañeda-Navarrete 2021), a functioning home garden can facilitate ecosystem services (Mohri et al. 2013), vegetation (Ali et al. 2021), carbon sequestration (Devi et al. 2020; Mattsson et al. 2015), and commercialization (Prihatini et al. 2018). During critical times such as the Covid-19 pandemic, restrictions on social and economic activities have reduced the availability of foods on the market. While most of the living activities are at home, this situation also forces the family to use their home garden to support food availability. In addition, to meet the family's food needs, the home garden can also be used as an added economic value (Naigaga et al. 2021). Therefore, home garden-based agritourism concepts must be well developed to grow the community's economy. Furthermore, tourism is a promising economic growth driver (Adedoyin et al. 2021; Summers et al. 2019; Rifa and Hossain 2022). Bojanic and Lo (2016), Jalil and Mahmoud (2013), and Pulido-Fernández and Cárdenas-García (2021) revealed that the tourism sector has a significant effect on economic growth.

Agritourism, in a broad sense, is defined as one of the tourism sectors that utilize agricultural business in the

village as the main object (Arroyo et al. 2013). Sonnino (2004) and Galluzzo (2022) broadly defined agritourism as agricultural or complementary activities to attract visitors, emphasizing agricultural and cultural aspects of farming. The concept of agritourism that utilizes rice fields or plantations has been widely implemented in various regions (Barbieri 2019; Arroyo et al. 2013). However, one potential has not been examined and optimized: using a home garden as an agritourism area. A home garden is generally defined as a plot of land around a house with private ownership status, either individually or in household ownership, with clear boundaries (Arifin 1998). Previous studies have examined the effect of functioning home gardens as ecosystem services, constraining disservices in cities, and its commercial implication for agritourism (Mohri et al. 2013; Mattsson et al. 2015; Larson et al. 2020; Abdoellah et al. 2020).

The existence of agritourism based on the community's home garden is expected to be a source to increase community income as well as regional own-source income and preserve the biophysical resources of the community's home garden (Mohri et al. 2013). One interesting area to study is Banyuwangi District, which has had very high tourism and economic growth this decade. Li et al. (2016) demonstrated that the small tourism industry could increase regional income and reduce regional income inequality. The existence of agritourism based on community gardens in Banyuwangi is currently complementary to the main

tourist destinations. However, the existing home garden-based agritourism has not been able to grow properly due to several constraints. These obstacles are the low skills of human resources, inadequate accessibility and amenities, lack of community awareness, institutional models that are not yet appropriate, and the absence of regulations that support the success of home garden-based agritourism. Arintoko et al. (2020) described several things that greatly hamper tourism development policies: lack of synergy, lack of communication between stakeholders, incompetence of policy implementers, and lack of community participation.

Meanwhile, Graci (2016) stated that achieving policy goals in tourism development requires effective management planning strategy support built from various points of view, knowledge, and experience from practitioners, researchers, and various stakeholders. Domestic gardens are a part of urban agriculture and are often grown on the city's margin (Madaleno 2000). With the significant growth of nature-based tourism in recent years, agritourism has also developed and become an important supporter of broader tourism destinations such as culture and beaches. This makes creative ideas by small-scale entrepreneurs and households emerge to add value to destination attractions in an area. As a result, the home garden (*pekarangan*) has emerged as a new tourism in Banyuwangi, which is used not only as a tourist destination but also as a contributor to household income and food security through its production. In this regard, investigations regarding the role of the home garden have been investigated in previous studies (Ali et al. 2021; Pérez-Olmos and Aguilar-Rivera 2021; Lisek 2012). However, this study differs from the previous one, focusing on the policy strategy for making *pekarangan* a sustainable tourist destination by identifying stakeholders' role in utilizing *pekarangan* as agritourism. Hence, proper holistic information is needed for policymakers to get an effective planning strategy. Thus, this study aims to determine the factors that play a role in successfully using a home garden (*pekarangan*) as an agritourism area in Banyuwangi District. This information is important to formulate home garden designs for sustainable agritourism areas.

## MATERIALS AND METHODS

### Place and time of research

This research was conducted in Banyuwangi District, East Java Province. Banyuwangi District is one of the regions in East Java Province, has an area of 5,782.50 km<sup>2</sup>, and consists of 24 sub-districts. The research starts from December 2021 to April 2022, consisting of preparation stages, research implementation stages, data processing, and analysis.

### Collecting data method

The collection of data and information for developing a home garden utilization system was carried out through field observations and interviews with relevant parties, such as land owners, business owners, administrators of community organizations, and village apparatus to the

district/city in the study location. In addition, directed discussions for sharing knowledge (knowledge sharing) were carried out through FGDs (focus group discussions) involving the Tourism and Culture Office, the Banyuwangi District Agriculture Office, community organizations such as Poktan/Gapoktan, Village Tourism Awareness Groups (Pokdarwis), and business actors, private sector, associations of tourism actors, as well as community leaders and humanists. The information obtained and the support of literature studies from various documents compiled the elements and sub-elements of the system being developed.

### Data analysis method

This study uses Interpretive Structural Modeling (ISM) analysis to identify the determinants and develop design formulations for utilizing home gardens (*pekarangan*) for agritourism areas in Banyuwangi District. The ISM method is used to identify the determining factors for successfully utilizing *pekarangan* as an agritourism area and to formulate the management concept design. According to Saxena et al. (1992), ISM is a descriptive modeling technique for structuring a direct relationship. The basis for decision-making in the ISM technique is the group. Structural models are generated to describe the complex problems of a system through carefully designed patterns using graphics and sentences. Through the ISM technique, the models that are not clear are transformed into visible system models. Figure 1 shows a chart showing Interpretive Structural Modeling (ISM) steps.

ISM analyzes the elements of the system and graphically presents each direct relationship and its hierarchical level. System elements are matters in the form of policy objects, organizational objectives, assessment factors, policy strategies, etc. The relatedness of the elements as a direct relationship can vary in a context. The relationship refers to the contextual relationship between elements, such as element (i) "better than" or "is success through" or "will help success" or "more important than" element (j). Summarized by Kanungo and Batnagar (2002) and Eriyatno (2012), the ISM stages consist of several steps: Identifying elements and arranging hierarchies. Hierarchical level determination can be approached with five criteria: binding strength within and/or between groups/levels; relative frequency of oscillations; a lower level shakes faster than the level above it; context; coverage; and functional relationships. The first consideration was (i) dividing substance into elements and sub-elements in depth until deemed adequate. The preparation of these sub-elements uses input from related groups. Furthermore, the contextual relationship between the sub-elements is determined and expressed in subordinate terminology, leading to pairwise comparisons. The second was that (ii) a Structural Self Interaction Matrix (SSIM) was prepared based on contextual relations. A Reachability Matrix (RM) table was made, and calculations according to the Transitivity Rule were made by correcting SSIM until a closed matrix was obtained. RM that has complied with the transit rule is then processed to determine the level (level partition) choice. Structural Self

Interaction Matrix (SSIM) is a matrix that presents respondents' perceptions of each element up to the direct relationship between elements. Reachability Matrix (RM) provides a symbolic conversion of SSIM into a binary matrix according to the conversion rules. If  $E_{ij}=1$  and  $E_{jk}=1$ , then  $E_{ik}=1$ , the initial RM modifies it to show all direct or indirect achievements (iii). After the third step, a digraph is made, and a pattern (term) is obtained from the directional graph. As a reference, it is a graphical representation of the elements, their direct relationships, and hierarchical levels. The initial graph is provided based on a canonical matrix which is then shortened by removing all transitivity into the final digraph form (iv). The structural model, the ISM model, is generated by transferring all element numbers with the actual element description to provide a clear picture of a system of elements and the flow of relationships (v).

The final results of the ISM technique are: key elements, structural diagrams, and DP-D (Driver Power-Dependence) matrices, which describe the classification of sub-elements as follows: Weak driver-weak dependent variables (Autonomous), generally the sub-elements are not related to the system and may have a little relationship, although the relationship can be strong (Sector I). Weak driver-strongly dependent variables (Dependent) that are not independent and will be affected by the program due to actions on other sectors (Sector II). Strong driver-strongly dependent variables (Linkage) must be studied carefully because the relationship between variables is unstable. Every action on these variables will impact the others, and the feedback effect can increase the impact (Sector III). Finally, strong drive-weak dependent variables (Independent) have a large driving force on the success of the program but have little dependence on the program (Sector IV) (Figure 2).

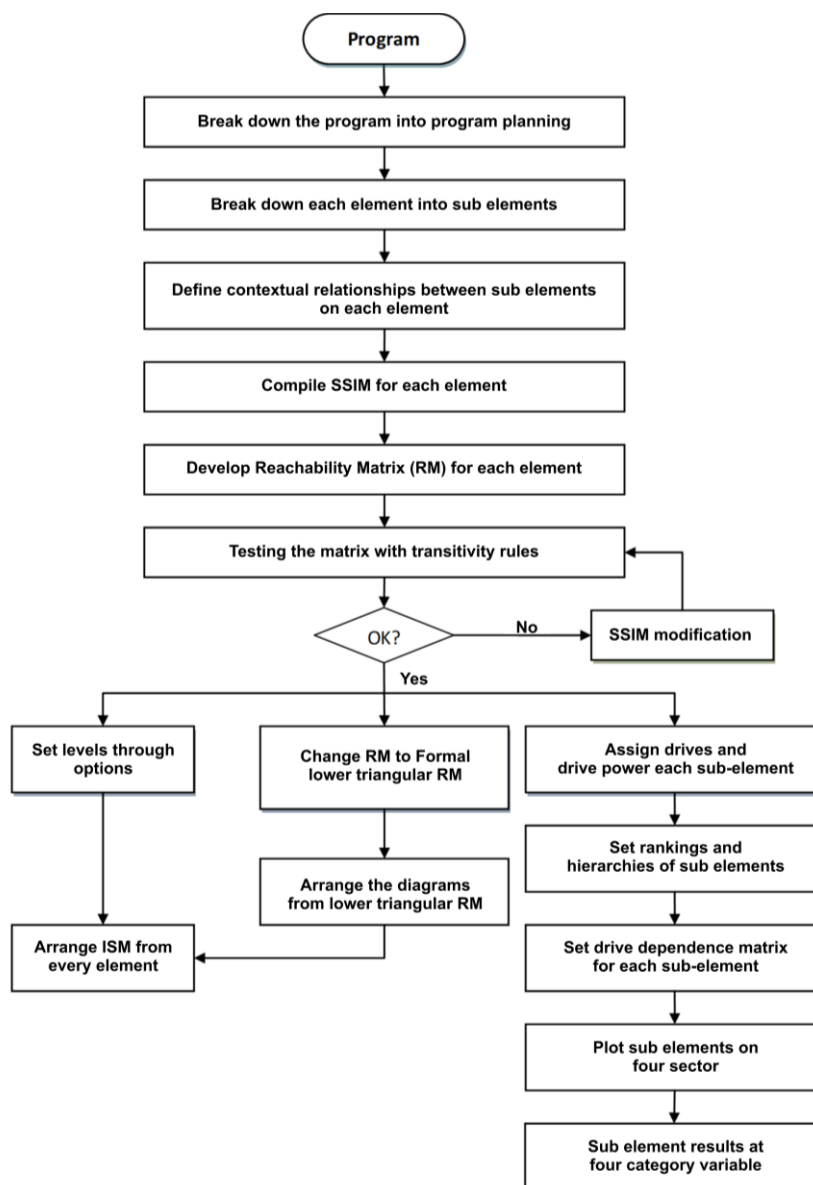


Figure 1. Flow chart of ISM

<i>Driver power</i>	IV. Independent: Strong Driver weak Dependent variabels	III. Linkage: Strong driver – strongly Dependent variabels
	I. Autonomous Weak Driver - weak Dependent variabels	II. Autonomous Weak Driver - strongly Dependent variabels
	<i>Dependence</i>	

**Figure 2.** Matrix Driver Power - Dependence

Saxena et al. (1992) stated that a program could be built from nine elements, namely (1) the community sector that is affected by the program; (2) the needs of the program; (3) the main constraints of the program; (4) possible changes in the program; (5) the objectives of the program; (6) benchmarks for assessing each program objective; (7) activities required for action planning; (8) activity measures to evaluate the results achieved; (9) institutions involved in program implementation. However, in this study, only 6 (six) elements were used according to the

results of the FGD agreement between stakeholders, namely: (1) the community sector affected by the program; (2) the needs of the program; (3) the main constraints of the program; (4) possible changes in the program; (5) The objectives of the program; and (5) institutions involved in program implementation.

Based on the literature review, the opinions of experts and stakeholders, as well as field observations, the sub-elements of each element and their contextual relationships can be identified, as shown in Table 1.

**Table 1.** Elements, sub-elements, and contextual relationships between sub-elements

Code	Element	Sub-element	Contextual relationship
G	Program goals	Preserving local resources Maintain local cultural wisdom Increasing community (household) income Increase regional income Meet the food and nutritional needs of the family Growing MSMEs based on the potential of local natural resources	G <sub>i</sub> contributes goal achievement G <sub>j</sub>
N	Program requirements	Competent, skilled, and entrepreneurial human resources Network of partnerships with tourism businesses Application of appropriate technology Financing schemes that are suitable for local communities Promotion facilitation Digitalization of tourism business management Sectoral regulations	N <sub>i</sub> support N <sub>j</sub>
E	Possible changes	Knowledge and skills of potential home garden management Community participation, local entrepreneurs, and community organizations Home garden-agritourism product development Patterns of cooperation and business partnerships Local government policies in regional development	E <sub>i</sub> resulted in E <sub>j</sub>
B	Program constraints	Lack of local HR knowledge and skills Lack of local community interest in the use of the home garden Lack of funding for development Lack of appropriate technology Lack of supporting infrastructure home garden area There is a change in the land use of the home garden	B <sub>i</sub> cause B <sub>j</sub>
C	Affected Sector of Society	Village/Kelurahan Local community leaders Home garden owner Social institutions Local entrepreneur Joint business group	C <sub>i</sub> influencing role C <sub>j</sub>
A	Related institutions	Local government Tourism Industry Association Tourism Awareness Group Poktan/Gapoktan/KWT Village Government Mass Media & Electronic Institutions Universities/Research Institutes	A <sub>i</sub> influence A <sub>j</sub>

Note: ij = 1,2,3,.....(i,j ≤ 10)

**RESULTS AND DISCUSSION**

The key elements of a system are generated from the interpretation of ISM analysis data, which shows the levels of system structure. Eriyatno (2012) mentions the determination of levels through an approach with five aforementioned criteria. The program, the system under study, is divided into elements, each consisting of several sub-elements. Program elements that have sub-elements with the highest level, then these sub-elements are declared to be key elements. The results of interpreting the contextual relationship of each element of the home garden utilization program as an agritourism area follow.

**Critical factors for program success**

In terms of program objectives, the sub-element maintaining local cultural wisdom (G2) is a key sub-element because its role can affect all sub-elements of the program objectives. For example, the success of this program's objectives will impact the achievement of objectives on sub-elements at level 1 (Figure 3).

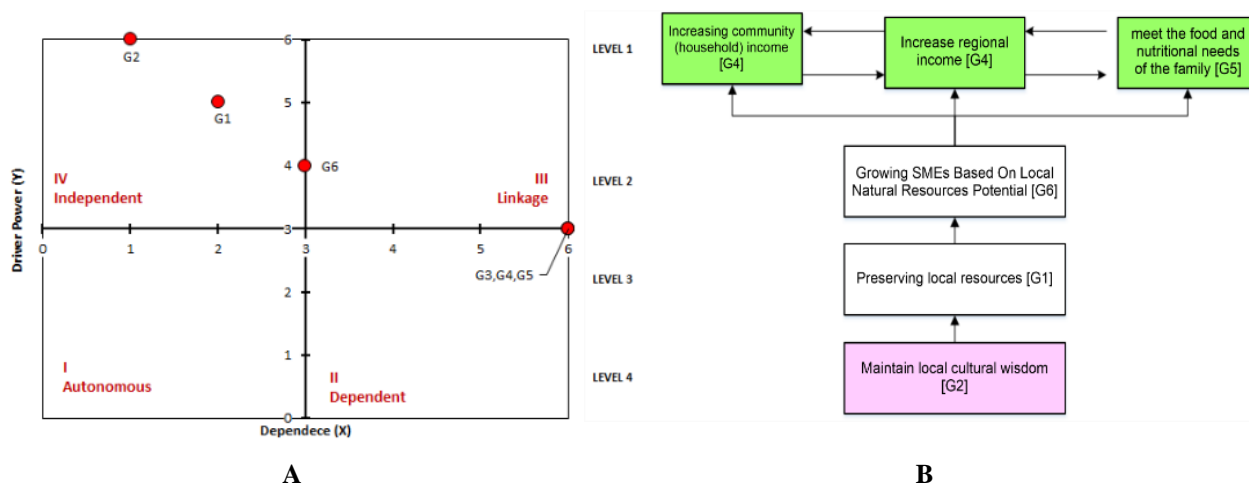
Maintaining local wisdom can support the success of achieving the goals of increasing community income, increasing regional income, and meeting the nutritional food needs of families. Local wisdom in the form of knowledge, diversity of biological resources, and the ability to cultivate a home garden can be maintained. It will be beneficial for the three sub-elements of this goal.

Setting goals is a frame of the system built and does not stand alone (Dettmer 2007). The achievement of goals is influenced by critical success factors (Balaban 2020), which require certain conditions. The home garden utilization program as an agritourism area also needs support to realize the goals that have been set. The results of the ISM analysis show that the program needs element, which consists of seven sub-elements, indicates that sectoral regulations are the determining factor needed. Figure 4 shows the sub-elements of program needs in the

form of a partnership network for tourism business actors (N2), application of appropriate technology (N3), appropriate financing schemes (N4), promotion facilitation (N5), and digitalization of tourism business management (N6). have a high dependency. These five needs are supported by competent, skilled, and entrepreneurial human resources (N1). Furthermore, to meet the need for capable human resources, sectoral regulatory support (N7) is needed at level 3. Thus, the sub-element of sectoral regulations is urgently needed to achieve the goal of using a home garden (*pekarangan*) as an agritourism area. Linkage with sectoral programs is also a critical factor for its success.

Change is a process made systematically by applying the facilities, resources, and knowledge needed to impact the process (Düren 2013). Every change must be managed properly to increase the benefits and reduce the negative impacts. The research was conducted in community home gardens in Banyuwangi District as a study location. The home garden use in Banyuwangi has not been managed effectively and efficiently. Therefore, change becomes a necessity to increase its usage and value. Based on discussions with stakeholders and experts, five possible sub-elements for change can be identified. During the SSIM modification process using transitivity rules and expert input, changes in the contextual relationship matrix regarding possible changes occur. The process of acquiring the knowledge of experts as thinking respondents in their assessment showed a consistency level of 99.9%, meaning that experts are consistent and understand the existence of possible changes to build solutions to achieve the system's goals.

Based on Figure 4, the possible change in the elements is the development of agritourism products in the home garden as an economic driver. However, the determining factor is the policy of the regional government in regional development. This determinant will affect the other four factors at level 3, level 2, and level 1.



**Figure 3.** Diagram of (A) the power-dependence driver and (B) the structure of the program's objective elements

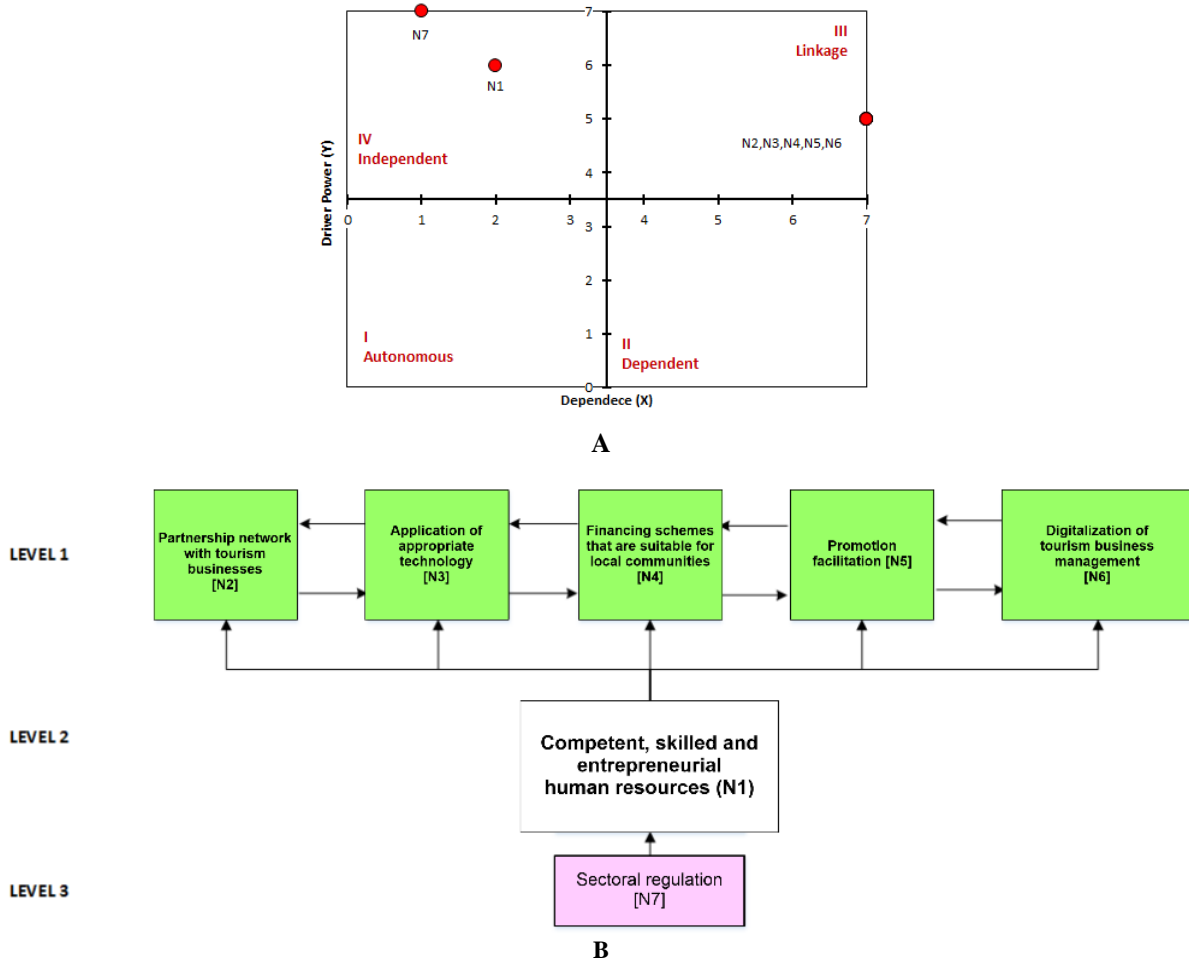


Figure 4. Diagram of (A) the power-dependence driver and (B) the element structure of the program requirements

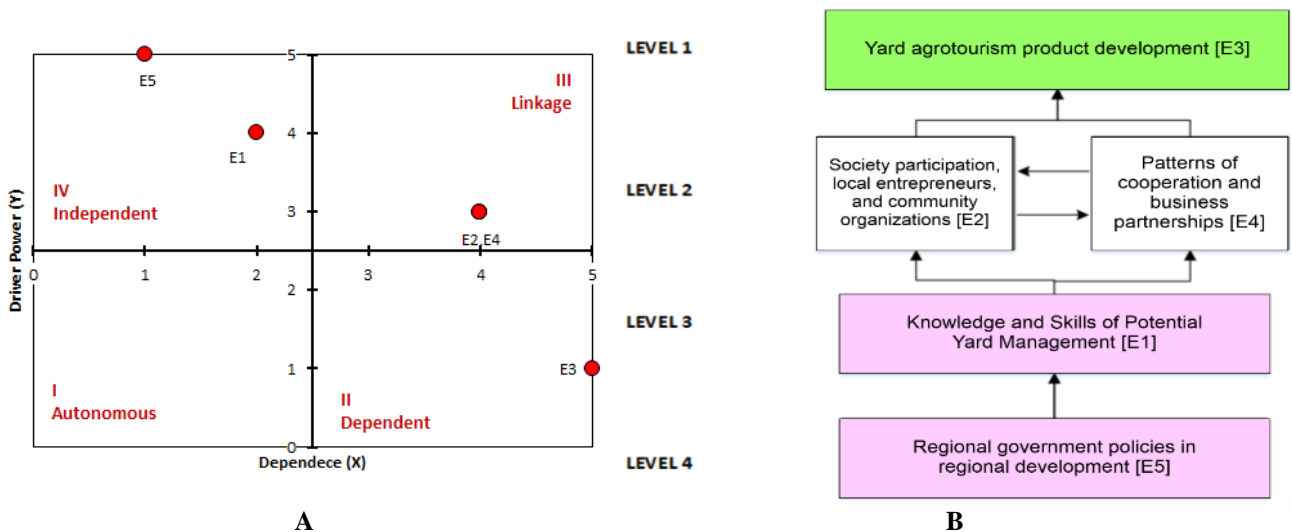


Figure 4. Diagram of (A) the power-dependence driver and (B) the structural elements of the possible changes

Interpretation of the structure of the program's constraint elements is presented in Figure 5, that the level of the level 1 structure is a change in the allotment of home gardens (B6). The lack of public interest in the use of the

home garden causes the occurrence of this obstacle. As a result, people tend to leave their home gardens unused. The lack of public interest can also be caused by a lack of appropriate technology (B4) and supporting infrastructure

(B5). These two sub-elements at level 3 provide feedback and influence each other. However, those are also heavily affected by the lack of local HR knowledge and skills (B1) and the lack of financing (B3). Therefore, sub-elements B1 and B3, which are sub-elements at level 4, are the determining factors for successfully using the home garden as an agritourism area in Banyuwangi District.

Elements of the community sector that are affected by the home garden utilization program based on the identification of stakeholders show that the main role of the local community is very important. The results of an expert survey using the ISM technique obtained the position of the variables in the system modeling, causing differences in the structural level, as presented in Figure 6. Level 1, the lowest level that has a high level of dependency and a low level of the driving force, is the owner of the home garden (C3), influenced by local entrepreneurs (C5) and joint venture groups (C6). The two sectors at level 2 provide

mutual influence and feedback on the activities of the system being built. Based on the structural analysis, the community sector at level 2 is also influenced by community leaders (C2) and community organizations (C4). These findings align with previous research highlighting the role of Tourism Awareness Groups (Pokdarwis) in the community as aggregators that connect individuals and other institutions to develop regional tourism potential (Nindyatmoko et al. 2022; Nurhasanah and Van den Broeck 2022). The central role of the Pokdarwis is also influenced by the village/kelurahan government (C1). This sector strongly encourages local communities to mobilize their tourism potential, in this case, the potential for home garden-based agritourism. At level 4, the village government is a determining factor for success because of its ability and authority to consolidate all village-level stakeholders to manage their agritourism area.

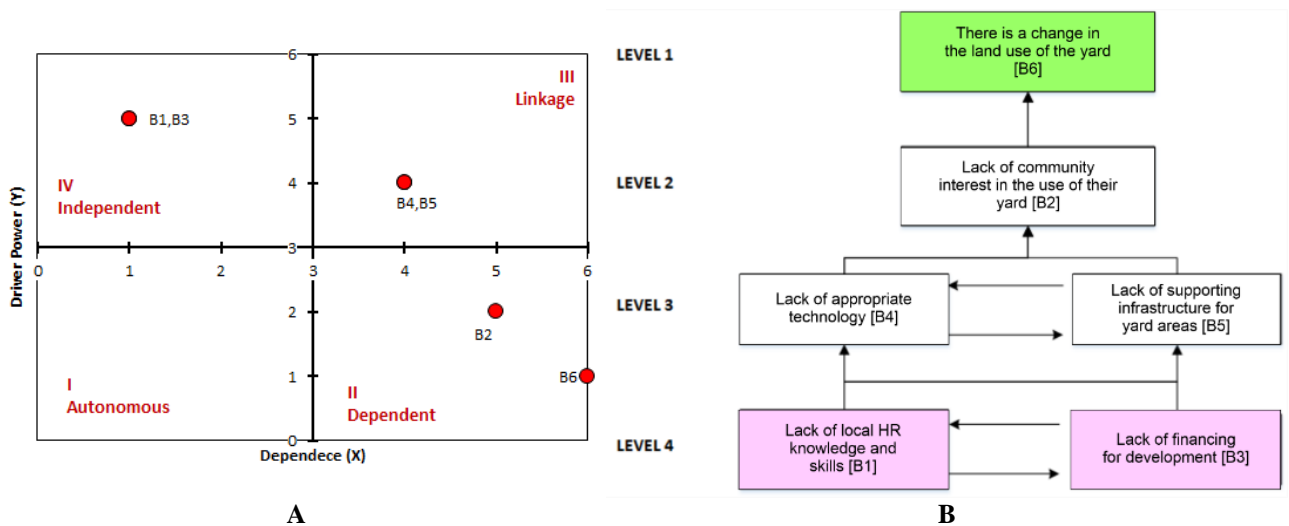


Figure 5. Diagram of (A) the power-dependence driver and (B) the structure of the program's constraint elements

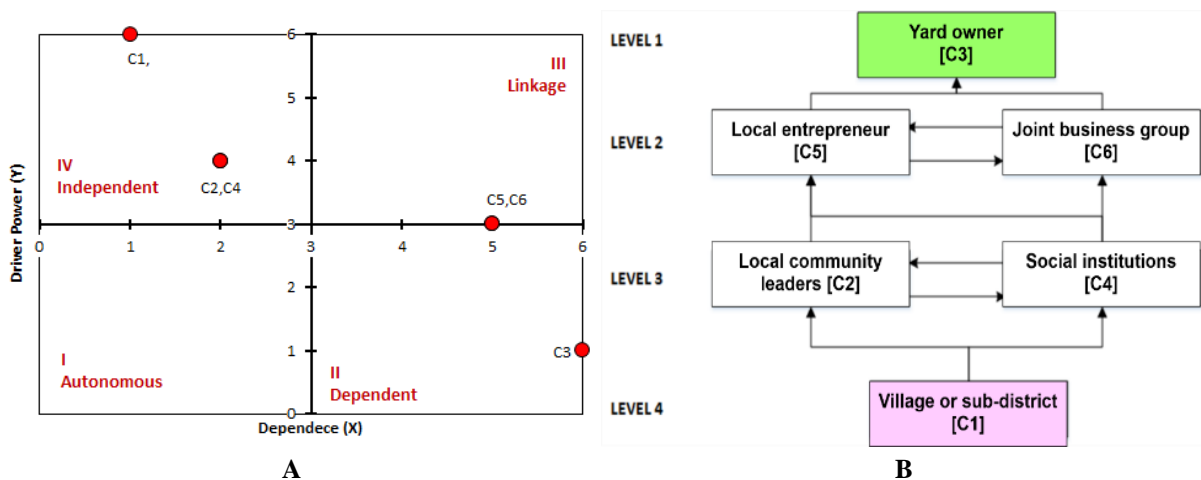


Figure 6. Diagram of (A) power-dependence drivers and (B) the structure of elements of the community sector

In the last element section, the elements of the institutions involved in the program identify ten stakeholders who play a role in utilizing the *pekarangan* as an agritourism area. As presented in Figure 7, these ten stakeholders are then simplified into seven sub-elements because the sub-elements of the regional government already represent the Tourism Office, Agriculture Service, and Bappeda. Meanwhile, the community is combined with the land owner. According to Fadhil et al. (2018), institutions can be interpreted as an organization with a hierarchy coordinated by administrative or authority mechanisms. Therefore, it becomes very complex, and many parties influence each other. The results align with previous studies demonstrating the institutional role of the oil palm smallholder. Raharja et al. (2020) showed the form of institutional partnerships for developing agroindustry that could grow the local economy. Similarly, the findings are consistent with Fakhurrizi et al. (2018), demonstrating that the partnership of various parties with different duties and responsibilities having the same goal is needed to develop cocoa agroindustry-based agritourism. These partnerships can grow the technology-based economy of local communities through the integrated and sustainable business platform.

Based on the final RM, it can be determined that the level of the structure consists of five levels. Level 1, the lowest level, has a high level of dependency and a low level of thrust. The institutional sub-elements are the community and landowners (A4), whose roles are influenced by Farmer Groups (Poktan), Gapoktan, or Women Farmers Groups/KWT (A3), which are at level 2. The district government (A1) and Village Pokdarwis (A7) occupy the highest level positions. Finally, the sub-elements at level 5 are stated as key elements of the institutions involved because they are independent variables with high impetus. The results align with previous studies demonstrating village government's and

community participation's role in fostering agritourism in rural areas (Komariah et al. 2021; Bosone and Nocca, 2022; Wirahayu et al. 2022).

**Home garden utilization and design formulation as an agritourism area in Banyuwangi District**

The considerations to solve the problem are the low knowledge of the community in the field of utilizing home gardens to become agritourism areas and the lack of financing schemes. For this reason, it is necessary to build synergy between stakeholders, where the important institution to become the driving force for its management is Podarwis. However, its success in coordinating and organizing other stakeholders is highly dependent on the role of the district government, which the village government and other stakeholders support.

Together with land owner groups, Poktan/Gapoktan/KWT, and business groups around the main destinations provide attractions in arts/culture and agricultural thematic attractions. The area manager, through the platform, provides amenity information and collaborates with associations of business actors around the agritourism area. Regional managers as aggregators are also required to partner and network with tourism business actors. In guiding providers of tourism service products, tourism aggregators in rural areas collaborate with village/ *kelurahan* governments to strengthen the capabilities of farmers/communities in agritourism areas. In addition, the role of tertiary institutions is to develop inventions that can be transferred to home garden-based tourism service actors. Service standards will be monitored and fostered by tourism industry associations. Systematically, the design formulation for using home gardens as home garden-based agritourism areas in Banyuwangi District is presented in Figure 8.

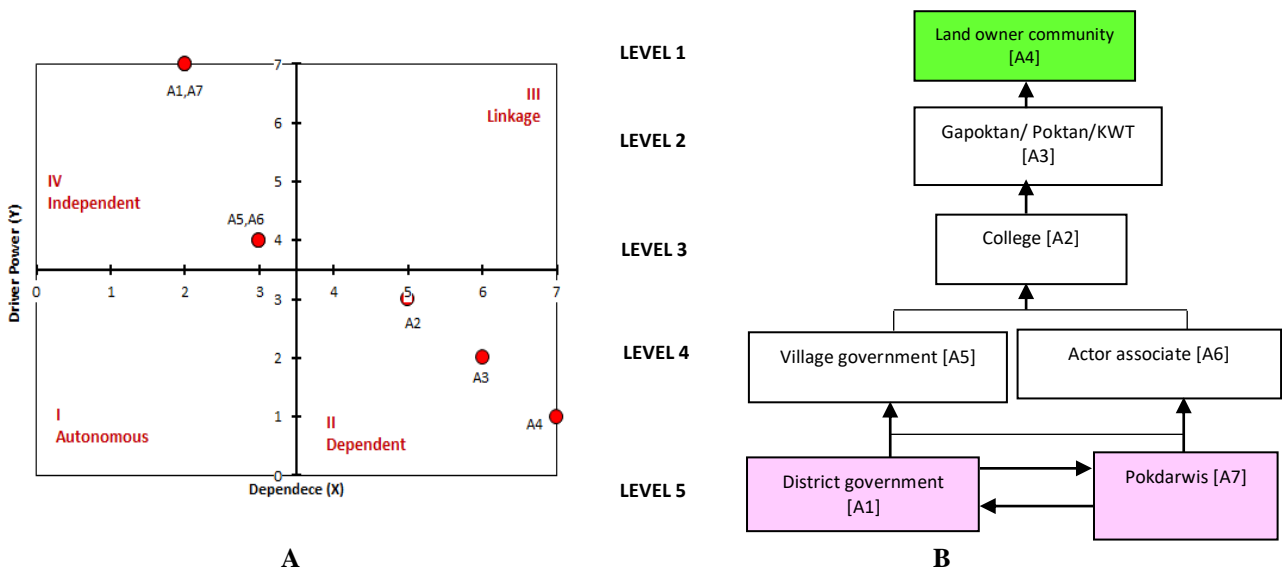
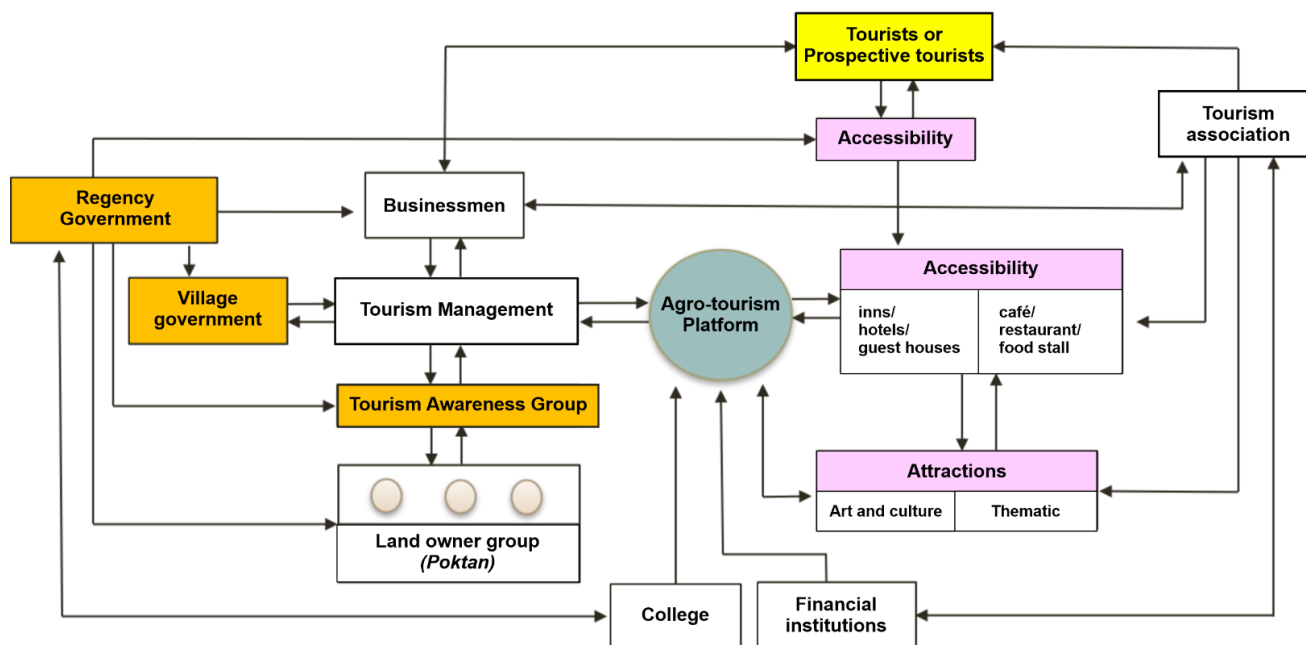


Figure 7. Diagram of (A) power-dependence drivers and (B) the structure of the institutions involved



**Figure 8.** Home garden on Utilization System Design Plan as an agritourism Area in Banyuwangi District

This research was conducted in Banyuwangi District, East Java Province, to analyze the home garden utilization system. Interpretive structural modeling (ISM) was used to identify the determinants and develop design formulations for the utilization of *pekarangan* for agritourism with five criteria used. The results showed that the key elements of the system structure produced through the ISM method, the use of a community home garden (*pekarangan*) as an agritourism area, which aims to preserve local cultural wisdom, namely the cultural wisdom of the community and the wisdom of community agricultural activities in the *pekarangan*. Achieving these goals requires sectoral regulations that can encourage government policies and their implementation in developing models for utilizing *pekarangan* as agritourism areas.

As a practical implication, management institutions must also develop financing schemes with financial institutions, both banks, and non-banks, based on financial technology (fintech). Furthermore, affordable financing for farmers/providers of tourism products, with their aggregator avalist. The manager of the *pekarangan* as an agritourism area is played as an aggregator of regional business processes by building inter-village networks and connectivity to major tourist destinations. Thus, home garden-based agritourism can create new tourism area units networked with the main tourist destinations to form a network of tourism destinations. The digitization of the home garden agritourism platform supports its management. This aggregator institution also functions as a consolidation of the three key elements of agritourism, namely attractions, amenities, and accessibility. Travel aggregators align the demand and supply of these three elements.

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