INDIGENOUS AGRICULTURE
Vol 1 No 1 March 2023
DOI: https://doi.org/10.20956/ia

OPEN ACCESS: Research Article

Promoting Indigenous Agricultural Systems through Strategy Design to Restore the Popularity of *Salak Lasape*

Andi Nuddin[1]*, Dedy Putra Wahyudi[2], Bunga Dara Amin[3], Rayhana Jafar[4]

[1]Faculty of Agriculture, Universitas Muhammadiyah Parepare, Parepare, Indonesia
[2]Faculty of Animal Husbandry and Fisheries, Universitas Sulawesi Barat, Majene, Indonesia
[3]Faculty of Mathematics and Natural Sciences, Universitas Negeri Makassar, Makassar, Indonesia
[4]Faculty of Agriculture, Universitas Brawijaya Malang, Malang, Indonesia

*Correspondence e-mail: andinuddin1956@gmail.com

Received : **February 01, 2023**
Accepted : **March 23, 2023**
Published : **March 31, 2023**

Abstract
Salak (*Salacca zalacca*) is a cultivated plant species with development areas spanning over half of Indonesia's provinces. It is not surprising since salak is a tropical plant native to Indonesia, managed traditionally for generations as an indigenous agricultural system. Learning from experience around the 1980s, the peak popularity of salak commodities in this area succeeded in becoming a commodity as regional icon of Pinrang Regency, South Sulawesi, called *salak lasape*. Although salak lasape is better known for its distinctive aroma, the production quantity in Pinrang Regency is declining. This research aims to find appropriate strategic programs to ensure food availability, especially fruit, and restore the popularity of salak lasape as a regional icon in South Sulawesi. This research was conducted through an expert system approach. Data were obtained through resource persons from several institutions/agencies related to developing horticultural commodities using the Interpretative Structural Modeling (ISM) analysis method. The results show that of the 14 sub-elements analyzed, there are nine of them that can be set as strategic programs in restoring the popularity of salak lasape, namely: (1) increasing the commitment of government agencies, (2) developing the marketing sector, (3) rehabilitating/rejuvenating salak plantations, (4) developing processed household products, (5) increasing farmers' knowledge and skills, (6) increasing the role of extension/mentoring, (7) fostering farmer groups/local wisdom, (8) Effectivize the role of the Industry and Trade Office, and (9) increasing the role and responsibility of the Plantation Office. Among the nine programs, two are key programs, namely: increasing the commitment of government agencies and rehabilitating/rejuvenating salak plantations. As a key program, government agencies' commitment to developing indigenous agriculture can be a driving force so that all strategic programs will run towards restoring the popularity of salak lasape under the control of a strong institutional system.

Keywords
Indigenous agriculture; Salak lasape; Agriculture Institutions; Horticulture

1. Introduction

Salak (*Salacca zalacca*) is a cultivated plant species with its development areas spanning over half of the provinces in Indonesia. This is not surprising because salak is one of the tropical plants native to Indonesia (Hadiati, 2012). As a native Indonesian plant, the development of salak cultivation is included in the indigenous agricultural system. This commodity has the opportunity to grow in various topographic areas, both in the lowlands and highlands. This means that agroclimatic conditions are not a limiting factor for salak commodities in Indonesia. This is in accordance with the findings of Petra et al. (2021) that the adaptation of native plants

is not extreme to climate and weather, with an average rainfall range of 1,700-3,100 mm per year and an average daily temperature of 22-32°C. Although natural factors, both geographical-geomorphological and climatological-meteorological are not an obstacle, it does not mean that this horticultural commodity is increasingly developing (Lakitan et al. 2019). In South Sulawesi, horticultural commodities, especially salak fruit, are still dominated by products produced by small farms and/or yards managed by family labor (Nuddin et al., 2021). Therefore, both product diversity and quality are still low (Hakim et al., 2018).

One of the regencies in South Sulawesi is Pinrang Regency, in addition to being a rice production center, almost all horticultural commodities are very potential to be developed in this area. Learning from experience around the 1980s, the peak popularity of the salak commodity with the designation salak lasape succeeded in becoming a commodity as a regional icon in South Sulawesi. Although lately, the popularity of salak lasape has only been a promotional material in traditional markets. Salak fruit from Enrekang Regency is promoted by enchanting the name salak lasape to attract consumers. Salak lasape commodity is better known for its distinctive aroma, but its production is declining in quantity. On the other hand, Enrekang Regency managed to excel in the first position with a large range of production achievements (Table 2). The South Sulawesi Central Bureau of Statistics released data in 2020 showing that the three largest salak-producing districts are East Luwu 135 tons, Pinrang 705 tons, and Enrekang 10,860.8 tons.

This research focuses on determining the strategy to restore the popularity of salak lasape as an indigenous agricultural commodity produced through traditional knowledge and experience of local communities (Efendi et al., 2021). In addition, to preserving regional icons, it can also ensure the availability of foods, especially fruit, on a national scale (Asih et al., 2017). It can even contribute to improving the welfare of farmers and society in general. Therefore, this study requires a sharper understanding and analysis of the region's factual conditions of salak farming. First, salak farming is an indigenous farm, managed traditionally based on hereditary experience, with no technological innovation and very limited farming capital (Santos et al. 2018). Second, the existence of other commodities with guaranteed markets and more lucrative prices has triggered the increasingly widespread conversion of salak land to other farms. Third, the absence of crop rejuvenation, so that the age of plants is getting older, directly impacts the decline in plant productivity. Fourth, the absence of regulations/policies that can regulate all farm management activities. Fifth, weak institutional support from both government and local community institutions (Osorio & Rivas, 2017), so farmers are less enthusiastic about developing their farms. Sixth, to preserve indigenous commodities, strategic programs are needed to develop indigenous agricultural systems to improve farmers' general welfare.

Starting from the six main ideas, as stated last, this research study focuses on raising the motivation of traditional farmers as the pioneer of restoring the popularity of salak lasape as a regional icon in South Sulawesi. Therefore, a strategic program is needed that is able to revitalize institutions through the functioning of both formal and non-formal institutions (Arsyad et al., 2021) in the context of efforts to develop indigenous agricultural systems to encourage the stretching of the lasape salak agribusiness in South Sulawesi. Although salak lasape still survives, its popularity is declining. Weak institutional support has made farmers unable to make salak farming as one of the cornerstones of hope to design their household economy (Nuddin et al., 2018). This research aims to find appropriate strategic programs to

ensure food availability, especially fruit, and restore the popularity of salak lasape as a regional icon in South Sulawesi.

2. Materials and Methods

2.1. Research Site

This study was conducted to assess the fruit horticulture farming sector in Pinrang Regency, South Sulawesi. Apart from being known as a rice center, Pinrang Regency is also a producer of salak fruit. Past experiences still depict the impression of how the popularity of this commodity as a regional icon with the name salak lasape. Because of its sweet aroma, the local community named it salak *gula-gula*. Therefore, to bring back the past glory of salak lasape, Pinrang Regency was designated as the research location, as shown in the map (Figure 1). This research location is one of 24 regencies/cities in South Sulawesi. The geographical position of this region is on the west coast, precisely on the southern arm of Sulawesi as an area bordering West Sulawesi Province.

Figure 1. Location of the study

2.2. Data Collection

The data required in this study consisted of; (i) primary data and (ii) secondary data. The types and data sources are adjusted to the analytical approach, namely Interpretative Structural Modeling (Rusydiana, 2018). Therefore, the type of data needed is sourced from institutions such as Regional Work Units (SKPD) obtained in the field through field observations/surveys. Secondary data collection regarding the dynamics of salak farming was obtained through documentation data collection techniques (Table 1), while primary data regarding institutions and strategies for salak farming development were obtained through interviews with resource persons representing SKPDs related to horticultural commodity development.

Table 1. Data usage characteristics and needs

Data characteristics	Data usage	Data sources
Secondary data is in the form of research/observation and studies documented through certain institutions.	To describe the dynamics of salak lasape farming as a horticultural commodity in Pinrang Regency.	Results of previous research and documentation from various related institutions.
Primary data: Sub-elements as strategic programs in salak farming development, obtained through interviews with experts/practitioners as resource persons.	To identify and establish a strategic development program to restore the popularity of salak lasape as a horticultural commodity in Pinrang Regency.	Resource persons are experts and practitioners from various related institutions.

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2.3. Data Analysis

Data analysis was carried out through the Interpretative Structural Modeling (ISM) approach with stages (Figure 2), namely: (i) preparation of Structural Self-Interaction Matrix (SSIM), namely transferring the results of resource persons' assessments into symbols V, A, X, and O; (ii) preparation of the Reachability Matrix table by replacing the symbols V, A, X and O with numbers 1 and 0; (iii) preparation of the Driver Power-Dependent Matrix (DP-D) to determine the cluster of sub-elements in the four quadrants (independent, linkage, dependent and autonomous); and (iv) preparation of a strategy program structuring model to restore the popularity of salak lasape as a horticultural commodity in Pinrang Regency, South Sulawesi. The clusterization of the 14 sub-elements in each quadrant is as follows:

Quadrant 1: Strong driver-weak dependent variables (independent). The sub-elements in this quadrant greatly influence the system, as indicated by the weight of the driver power of each sub-element (DP) >0.50. In addition, the dependence on other sub-elements is small, indicated by the weight of dependent (D) ≤0.50. Therefore, all sub-elements in this quadrant are independent variables (Figure 3 and Table 3).

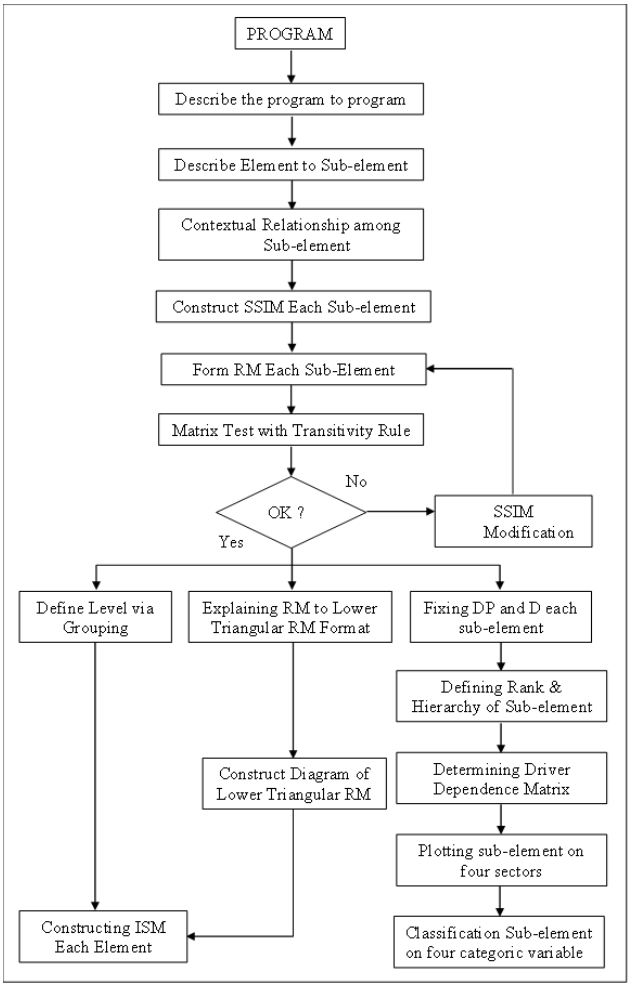

Figure 2. Flowchart of ISM (Eriyatno. 2012)

Quadrant 2: Strong driver-strongly dependent variables (linkage). Sub-elements in this quadrant strongly influence the system, while their dependence on other sub-elements is also great. The strong influence and the amount of dependency on other sub-elements can be seen from the driver power (DP) and dependent (D) weights, each of which is > 0.50 (Figure 3 and Table 3). Therefore, all sub-elements in this quadrant must be studied carefully because the relationship between sub-elements is unstable. Any action on a sub-element can impact other sub-elements, and feedback effects can magnify the impact and/or create new problems.

Quadrant 3: Weak driver-strongly dependent variables (dependent). Generally, the sub-elements here are not free (depending on other variables) and their influence on the system is weak. This is identified by the dependent weight (D) >0.50 and the driver power (DP) weight ≤0.50. Therefore, the sub-elements in this quadrant are not included as priority programs (Figure 3 and Table 3).

Quadrant 4: Weak driver-weak dependent variables (autonomous). The sub-elements in this quadrant are generally unrelated to the system and/or may be strongly related but do not affect the system. It can be understood

that the strength of the influence of a sub-element on the system is determined by the amount of driver power (DP) weight. The greater the DP, the stronger/greater the influence on the system. It is a provision in the ISM that the strength of influence of a sub-element on the system is divided into two, namely large/strong DP > 0.50) and small/weak (DP ≤ 0.50). Similarly, the dependence of one element on another sub-element is distinguished by large (D > 0.50) and small/weak ≤ 0.50).

3. Results and Discussions

3.1. Current description of salak farming

The administrative region of South Sulawesi, which consists of 24 districts/cities, is inhabited by a population with a majority of farmers, especially food and/or horticulture. Horticultural cultivation (fruit and vegetables) has been known for a long time, even as a cultural heritage of the ancestors (Costa & Vernandes, 2016). Among the horticultural commodities cultivated, salak is also cultivated by farmers in South Sulawesi (Table 2).

Table 2. Salak Production by Regency in South Sulawesi in 2018 - 2020

Regency	Salak Production (ton)		
	2018	2019	2020
Bulukumba	10.6	0.3	42.6
Bantaeng	24.1	9.1	8.4
Gowa	36.2	35.7	4.6
Sinjai	2.6	6.0	4.9
Maros	50.5	84.3	26.5
Pangkep	0	0	0.5
Barru	2.6	6.9	4.6
Bone	8.2	10.0	9.4
Soppeng	0.5	0	12.2
Sidrap	14.8	15.0	13.9
Pinrang	1,690.1	705.9	705.0
Enrekang	10,188.1	5,312.0	10,860.8
Luwu	23.2	8.7	96.6
Tana Toraja	2.5	0.9	0
Luwu Utara	3.3	14.0	54.9
Luwu Timur	135.5	177.9	135.0
Toraja Utara	10.6	9.8	59.3
Seven other districts/cities do not produce salak			
South Sulawesi	12,203.4	6,396.5	12,039.2

Source: Statistics Agency of South Sulawesi Province 2022

Table 2 shows that Pinrang Regency, a district previously known for its popular salak lasape commodity, is still in second place. Although its position is still in second place, its production is far behind. Salak production in Pinrang Regency in 2018 reached 1.690,1 tons, then decreased in 2020 to only 705 tons. Compared to its neighboring district (Enrekang), we found that Pinrang District's production gap is even more evident. In 2018, Enrekang Regency's salak production reached above 10 thousand tons. Although in the following year it declined, in 2020, it increased to 10,860.8 tons, thus successfully outperforming all districts in South Sulawesi.

The difference in production between these two neighboring regions results from each local government's different agricultural policies. There are indications that government policies and commitments greatly determine the performance of regional agricultural development. This phenomenon also occurs in other regions, such as developed countries (Takeyasu et al., 2018). Horticulture (fruits and vegetables) is the main agricultural development sector in Enrekang Regency. Meanwhile, Pinrang Regency, although part of its territory is eligible for horticultural development, government policy is more focused on the food crop sector. This is a phenomenon that the local government has not seen horticultural agribusiness as one of the farming sectors that can boost the economy of farmer households.

The difference in the application of agricultural policies between the two regions is motivated by differences in physiology. The characteristics of the Enrekang Regency area are dominated by rough, mountainous, and hilly topography, as well as varying levels of slopes. Therefore, horticultural farming is the only mainstay sector. Furthermore, Pinrang Regency, half of which is identified with flat topography and a smooth irrigation system. Therefore, it has long been known as a rice center. But almost the other half of the region (the northern part) is dry land, rough topography, and the level of slopes varies. This region is more appropriate if horticultural agriculture is the mainstay sector. This is where the weakness in applying agricultural policy appears, namely planning is not based on comparative regional considerations. Different land characteristics are managed in the same farm management. Therefore, people who inhabit this area (up-land) feel disadvantaged by government policies.

3.2. Priority programs in restoring the popularity of salak lasape

The results of the ISM analysis of the 14 sub-elements as defined earlier, nine of them were nominated as priority programs in restoring the popularity of salak lasape as a regional icon (Pinrang) in South Sulawesi. The nine sub-elements are distributed in the independent and linkage quadrant, respectively, while the remaining five sub-elements are in the dependent quadrant (Figure 2). This quadrant (dependent) indicates the amount of dependency on other sub-elements. Therefore, the five sub-elements are not prioritized. Under certain conditions, the contribution of these five sub-elements will have a noticeable effect, depending on the influence of one and/or more of the nine priority programs, both in the independent and linkage positions.

The priority programs in the independent quadrant consist of four sub-elements, with an average driver power weight (DP) = 0.93. One of them is the program to increase the commitment of government agencies with the largest driver power weight (DP = 1.00). As a key program (Table 3), advocacy is needed to motivate institutions as stakeholders in formulating policies that lead to horticultural development efforts (vegetables and fruit). This predicate indicates the importance of a common commitment between government institutions (Edda, 2010) to restore the popularity of salak lasape as a form of indigenous agricultural development in South Sulawesi. As a key program, the program to increase the commitment of government institutions is expected to anticipate all institutional problems (Jafar et al., 2021), including weak coordination between institutions (Nuddin et al. 2019). The impact of weak coordination function is that conflicts of interest between sectors are not uncommon and some institutions are not institutionalized in accordance with their main tasks and functions (Nuddin, 2021).

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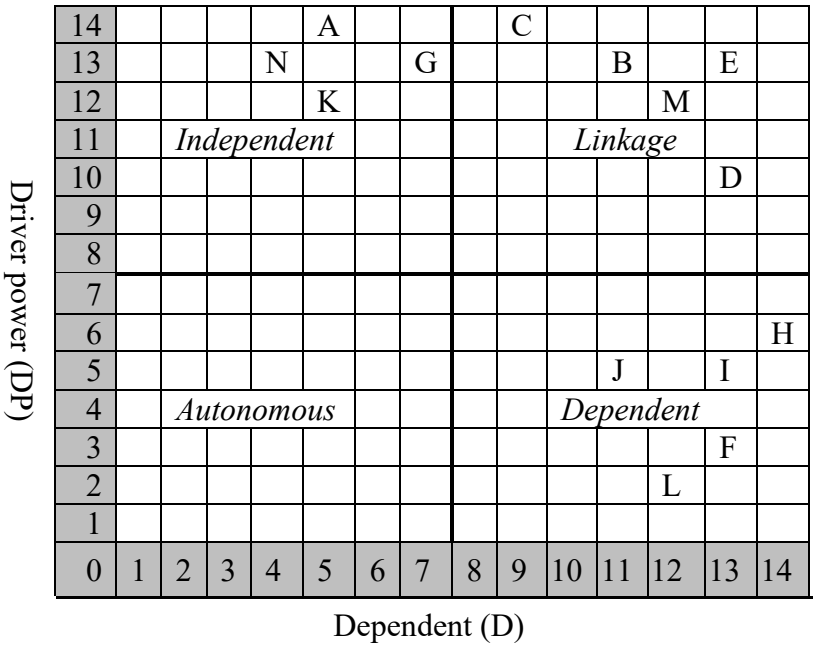


Notes:
A = Increasing the commitment of government agencies
B = Developing the marketing sector
C = Rehabilitating/rejuvenating salak plantations
D = Developing processed household products
E = Increasing farmers' knowledge and skills
F = Formation and development of farmer cooperatives
G = Increasing the role of extension/mentoring
H = Improvement of production facilities
I = Increased land productivity
J = Development of breeding business
K = Fostering farmer groups/local wisdom
L = Improvement of production quality
M = Effectivize the role of the Industry and Trade Office
N = Increasing the role and responsibility of the Plantation Office

Figure 2. Clusterization matrix of salak lasape development programs

Indications of the weakness of the institutional system both in the recovery of the popularity of salak lasape even on the development of horticulture in Pinrang Regency as shown by the results of ISM analysis (Figure 2 and Table 3), namely: the need to increase the role/responsibility of the Plantation Office, increase the role of extension, and the need for fostering farmer groups and local wisdom, with an average weight of DP = 0.93. The large achievement of the DP weight of these four programs indicates that to restore the popularity of Salak lasape, the maximum role of these four sub-elements is needed institutionally. Farmer group development and local wisdom are programs that are urgently needed. Farmer group development is not only required from an organizational point of view to distributing

assistance/incentives. The most fundamental role is how farmer groups are able to pass on values, ethics, customs, customary laws, and institutionalized behavior from generation to generation (Widodo & Hastuti, 2017). Among the ethical values, traditions, customary laws, and behavior related to horticultural farming activities (salak lasape) is local wisdom whose development becomes the task and responsibility of farmer groups.

In principle, increasing the commitment of government institutions is how the vision of local government can motivate the birth of a policy in the form of ideas, programs, and/or activities from all related institutions that lead to one goal, namely the restoration of the popularity of salak lasape as a horticultural farmer. As a priority program, increasing the commitment of government agencies as much as possible to protect the other three programs in the independent Quadrant so that all institutions understand the institutional philosophy, namely whom to do what and in what situations he can do something.

Table 3. Sub-element weights as a priority program for restoring salak lasape popularity

Quadrant	Sub-element/program	Weight	
		DP	D
Independent	Increasing the commitment of government agencies	1.00*)	0.36
	Increasing the role and responsibility of the Plantation Office	0.93	0.28
	Increasing the role of extension/mentoring	0.93	0.50
	Fostering farmer groups/local wisdom	0.86	0.36
	Average	0.93	0.37
Linkage	Rehabilitating/rejuvenating salak plantations	1.00*)	0.64
	Developing the marketing sector	0.93	0.78
	Increasing farmers' knowledge and skills	0.93	0.93
	Effectivize the role of the Industry and Trade Office	0.86	0.86
	Developing processed household products	0.71	0.93
	Average	0.89	0.83
Dependent	Improvement of production facilities	0.43	1.00
	Development of breeding business	0.36	0.78
	Increased land productivity	0.36	0.93
	Formation and development of farmer cooperatives	0.21	0.93
	Improvement of production quality	0.14	0.87
	Average	0.30	0.90
Autonomous	---	---	---

Note: *) Key programs

Similar to the independent quadrant, in this linkage quadrant (Figure 2), five sub-elements have identical characteristics and distinguish them from sub-elements in other quadrants, namely having DP and D weights > 0.50. The table above shows that the five priority programs in this linkage quadrant have a large driving force (DP) on the program and a large dependency (D)

on other sub-elements. Because of this characteristic (DP - D > 0.50), these five strategic programs (Table 3) must be intervened with a correct management approach. This is an indication of the large dependent weight (D > 0.50), which is dependent on other sub-elements (programs). In this case, it is not impossible with the pressure of external factors on one of the five priority programs (linkage), which will cause new problems that may hinder the development program of salak commodity and horticulture in general.

The results of the ISM analysis show that the rehabilitation/rejuvenation of salak plants is in the linkage quadrant (Figure 2) with the achievement of DP = 1.00 and D = 0.64. This is a priority program and even a key program to anticipate the condition of the old salak plants in Pinrang Regency. However, as a program in the linkage quadrant, plant rehabilitation/rejuvenation must be implemented under careful management control. As a program in the linkage quadrant, it can be successful, and its feedback effects can magnify and/or trigger new problems. This results from the high dependency on other sub-elements (Rizal et al., 2016). With the rampant development of corn farming in almost all regions in South Sulawesi, it is not impossible that salak rejuvenation could end up with land conversion from salak to corn. Therefore, implementing the salak rehabilitation/rejuvenation program needs to be done through careful consideration to anticipate external influences of indigenous agriculture extinction.

The same applies to marketing sector development programs. The marketing sector determines the success of agribusiness. In general, the agribusiness problems faced by household-scale farmers are the weakness of the marketing sector (Rahman et al., 2017). Therefore, the results of the ISM analysis indicate that the development of this marketing sector is a priority program (DP = 0.93 and D = 0.78) to restore the popularity of salak lasape in South Sulawesi. As a priority program in the linkage quadrant, implementing this marketing program must be considered to support the product development to be marketed. It is not impossible that fruit commodity marketing can grow and develop locally, but what dominates the market is the type of imported fruit produced outside the target development area. This means that the marketing sector grows and develops, but the goal of restoring the popularity of salak lasape will not be achieved. In this situation, farmers will not feel the economic stretch if the products marketed do not come from their farms.

To restore the popularity of lasape salak, improving farmers' knowledge and skills were found in the study as a strategic program in the linkage quadrant (Figure 2) with a DP-D weight of 0.93 each (Table 2). The magnitude of the weights of both the power and dependent drivers indicates that knowledge and skills greatly influence the development of lasape salak commodities as a regional icon in South Sulawesi. Not only that, but the ISM analysis also shows that the magnitude of the dependent weight indicates that the increase in knowledge and skills of farmers is influenced or highly dependent on other sub-elements. Opportunities for the community to gain knowledge and skills are open, along with the rapid development of information technology. Therefore, as a strategic program in the linkage sector, efforts to increase farmers' knowledge must be anticipated as much as possible so that the knowledge and skills that will fail the lasape salak popularity recovery program can be suppressed. The program to improve farmers' knowledge and skills can be carried out, among others, in education and training and/or extension and mentoring. In implementing this program, at least two institutions must be competent, namely: Agricultural/plantation extension agencies and

farmer groups. It is even possible that there are other related institutions. In this event, the importance of government institutional competence in restoring the popularity of Salak lasape is revealed again, especially if it is directed toward the development of plantation commodities in South Sulawesi (Nurhapsa et al., 2020).

In addition to the Plantation Office (independent quadrant), the effectiveness of role of the Industry and Trade Office is also a strategic program where its contribution is vital in efforts to restore the popularity of salak lasape in South Sulawesi. It can be shown in Figure 2 that the effectiveness of the main tasks and functions of the Industry and Trade Office is in the linkage quadrant. The important parameter of the main duties and functions of the agency can be shown based on the DP and D weights of 0.86 each (Table 2). The acquisition of both DP and D weights is a parameter of the importance of the role of this institution as a program to restore the popularity of salak lasape. However, in the implementation of further management, caution is needed. All priority programs in this quadrant need more intensive study because the relationship between programs is unstable. Any step taken by this sub-element (Industry and Trade Office) can impact other sub-elements, so the feedback effect can magnify the impact and/or potentially create new problems.

Furthermore, the last sub-element in this quadrant is the development of processed household products (Figure 2). This program is very strategic because it has a great driving force towards the recovery program of lasape salak popularity (DP = 0.71). The need to develop processed household products aims to improve the marketing sector, where the goods sold are primarily products and processed salak fruit in the form of finished goods. In managing this program implementation (Development of processed household products), it does not stand alone but is highly dependent on other sub-elements (D = 0.93). It can be ascertained that the development of processed household products is highly dependent on how government and private institutions guide community groups of farming actors (Karyadi, 2021).

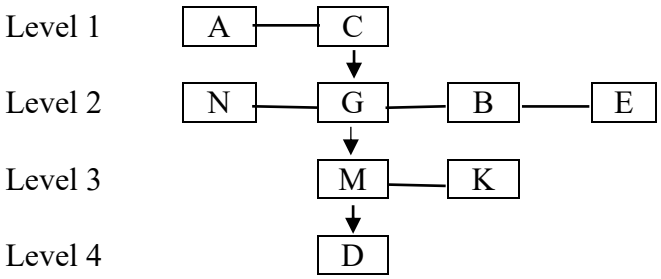
In addition to the nine strategic programs distributed in the independent and linkage quadrant, there are five other sub-elements in the dependent quadrant (Figure 2 and Table 3). As stated earlier (Data Analysis), the sub-elements in the dependent quadrant (Weak driver-strongly dependent variables) have an influence that is not independent. In general, changes that occur in the sub-elements in this quadrant depend on other variables. This is evidenced by the magnitude of the average dependent weight (D = 0.90) obtained (Table 3). In addition, its influence on the system is weak, as indicated by the small acquisition of the average weight of the driver power (DP = 0.30). Therefore, the sub-elements in this quadrant are not a priority in the program to restore the popularity of salak lasape in Pinrang Regency, South Sulawesi. However, as a sub-element in the dependent quadrant, it is not impossible that the five of them can contribute to the salak lasape popularity recovery program if other priority programs run optimally.

3.2. Priority program structuring model

The results of ISM analysis show several strategic programs for restoring the popularity of salak lasape, as illustrated in Figure 3. The vertical structural relationship between programs shows the order of priority, while the horizontal structural relationship shows that the implementation of the program is carried out simultaneously (Arsiwi & Adi, 2020).

Level 1; there are two sub-elements as priority programs. Both are key priority programs (DP = 1.00). As key programs, both must be empowered because their influence on the development of salak farming is very large. As a key priority program, it also determines the sustainability of other programs (Jessen et al., 2022; Salman et al., 2021) that will lead to the recovery of the popularity of salak lasape as a regional icon of Pinrang Regency in South Sulawesi. Similarly, with stronger government commitment, farmers will be motivated and more excited to develop their farms through salak rehabilitation and rejuvenation programs.

Level 2; There are four sub-elements as the second priority program (Figure 3). Two of these priority programs are how government institutions can maximize their role in achieving program objectives. The other two are activities, namely how the marketing sector can be developed and how farmers' knowledge and skills can be improved. The development of the marketing sector is under the control of the Industry and Trade Agency while improving farmers' knowledge and skills is the task of the Extension Agency or other institutions according to the structure and policies of the Local Government. This means that these four priority programs are also inseparable from institutional issues that need collective support in an institutionalized manner (Salcido et al., 2015).



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N = Increasing the role and responsibility of the Plantation Office

Figure 3. Structuring priority level of recovery strategy for salak lasape popularity

Level 3; There are two priority programs, namely the effectiveness of the role of the Industry/Trade Office and the effectiveness of the role of farmer groups. These two sub-elements are programs on regional institutional mechanisms so that the two institutions can play an effective role according to the program objectives. Furthermore, at **level 4**, there is only one priority program, namely the development of processed household products. The development of processed household products needs touch in the form of guidance from both government and private institutions. Therefore, the role of the Industry/Trade Office and other

institutions must be streamlined early through a common vision-mission and commitment to restoring the popularity of salak lasape as a regional icon in South Sulawesi.

As explained earlier, there are two priority programs. Both programs prioritize determining the sustainability of the salak lasape popularity recovery system (program). First, the Program to Increase the commitment of government institutions, as narrated earlier, is a program that is expected to generate a common vision of salak lasape commodity development for local government institutions. This program will evoke the same perspective of every relevant institution about the importance of horticultural development, especially the restoration of the popularity of salak lasape. Under these conditions, a sense of optimism about the coordination function between agencies will be effective (whom to do what). Second, rehabilitation and rejuvenation of salak plantations is a very important program. This is important to address the phenomenon in the field that the remaining salak plants are old and their production is declining. Therefore, rehabilitation and rejuvenation of plants are needed as a step to anticipate extinction.

Logically, there is no difference in the meaning/description of the salak lasape commodity development strategy program (Figure 3 and Table 3) and the narrative of the program structurization model (Figure 4). Figure 3 and Table 3 show the position (quadrant) of importance and indicators of program importance, while Figure 4 shows the relationship of interests between priority programs. A vertical relationship indicates which programs are more priority to run, while a horizontal relationship indicates that all programs at that level should be applied simultaneously.

4. Conclusion

To restore the popularity of salak lasape as one of the patterns of development of indigenous agriculture in Pinrang Regency, nine strategic programs were found, namely: (1) increasing government commitment, (2) rehabilitation/rejuvenation of plantations, (3) maximization of roles and responsibilities of the Plantation Office, (4) increasing the role of extension workers/mentoring, (5) developing the marketing sector, (6) increasing knowledge and therapy of farmers, (7) effective role of the Industry and Trade Office, (8) development of farmer groups and local wisdom, and (9) development of processed household products. Among the nine strategic programs, increasing the commitment of government agencies and rehabilitation/rejuvenation of salak plants are key strategic programs. The importance of increasing the commitment of government institutions indicates that institutional revitalization is necessary to accommodate eight other priority programs. The next key strategic program is the need for rehabilitation/rejuvenation of salak plants, which is a program to anticipate risk factors for the extinction of indigenous farming.

Acknowledgment

This research was made possible through the moral support of the Pinrang District Government. Therefore, it is appropriate on this occasion to express our gratitude and highest appreciation to the local government and all employees for their support and participation. enable the research can be carried out. Likewise, sincere thanks and appreciation to the experts/practitioners as resource persons who have provided the data/information needed.

Conflicts of Interest

The authors declare no conflicts of interest between us.

References

Adigoun, R. F. R., Houdegbe, A. C., Fassinou Hotegni, N. V., Segnon, A. C., N'Danikou, S., Adjé, C. A. O., Adadja, R. P. M., & Achigan-Dako, E. G. (2022). Enabling effective maize seed system in low-income countries of West Africa: Insights from Benin. Frontiers in Sustainable Food Systems, 6. https://doi.org/10.3389/fsufs.2022.1045629

Arsyad, M., Nuddin, A., Fahmid, I. M., Salman, D., Tina Pulubuhu, D. A., Unde, A. A., Rasyid J, A., & Amiruddin, A. (2021). Linkages of Inter-Institutional Roles Agricultural Development in Indonesia's Border Areas. Agroland: Journal of Agricultural Sciences, 28(1), 1–16. https://doi.org/10.22487/agrolandnasional.v27i3.619

Asih, N. D., & Klasen, S., (2017), Improving food security? Setting indicators and observing change of rural household in Central Sulawesi. Journal Forest and Society, 1(2): 154 – 161.

Arsiwi, P., & Adi, P. W. (2020). Interpretive Structural Modeling to Increase the Supply Chain Competitiveness of Mina Indo Sejahtera UKM. Journal of PASTI, 14(1), 26–36 https://doi.org/10.22441/pasti.2020.v14i1.003.

Callejo del, I and V. Cossio, (2009). Institutional Aspects of Sustainability for Irrigated Agriculture in Arid and Semi-Arid Regions. Chilean Journal of Agricultural Research. 96(Suppl.1): 41-53. http://dx.doi.org/10.4067/S0718-58392009000500005.

Costa, F. de Assis & D. A. Vernandes, (2016) Agrarian Dynamics, Institutions and Territorial Governance for The Sustainable Development of The Amazone. Journal of Contemporary Economics 20(3): 517-552. http://dx.doi.org/10. 1590/198055272036.

Edda Tandi Lwoga, P. N. (2010). Managing indigenous knowledge for sustainable agricultural development in developing countries: Knowledge management approaches in the social context. International Information & Library Review, 42(3), 174-185. doi:10.1080/10572317.2010.10762862.

Efendi, D., M. Meilinda., R. Riyanto. (2021). The Besemah Community's Indigenous Knowledge of Tebat Bukit Conservation in Tebat Benawa Village. BIOSFER: Jurnal Tadris Biologi. 12(2): 158-168. https://doi.org/10.24042/biosfer.v12i2.9641.

Eriyatno (2012). Ilmu Sistem: Meningkatkan Mutu dan Efektifitas Manajemen. Ed. 4. Guna Widya. Surabaya.

Hakim, L., N.R. Pamungkas., K.P. Wicaksono. & Soemarno. (2018). Conservation Osingnese Traditional Home Garden Agroforestry in Banyuwangi, East Java, Indonesia. AGRIVITA Journal of Agricultural Science. 40(3):506-514 http://doi.org/10.17503/agrivita. v40i3.1605.

Jafar, R., A. Nuddin., Khaerunnisa & N, Machmuddin. (2021). Institutional Systems in Planning and Strategy for Oyster Mushroom Business Development. IOP Conf. Series: Earth and Environmental Science 748 (2021) 012019, 1-7 doi:10.1088/1755-1315/748/1/012019

Jessen, T. D., Ban, N. C., Claxton, N. X. E. M. T. O. L. T. W., & Darimont, C. T. (2022). Contributions of Indigenous Knowledge to ecological and evolutionary understanding. Frontiers in Ecology and the Environment, 20(2), 93–101. https://doi.org/10.1002/fee.2435

Karyadi, L.W. (2021). The Existence of a Role of Indigenous Food Institution on Strengthening Foods Security of Rural Community. International Journal Papier Public Review, 2(1), 54-66. https://doi.org./10.47667/ijppr.v2i1.73

Lakitan, B., Lindiana, L., Widuri, L. I., Kartika, K., Siaga, E., Meihana, M., Wijaya, A. (2019). Inclusive and Ecologically-Sound Food Crop Cultivation at Tropical Non-Tidal Wetlands in Indonesia. AGRIVITA Journal of Agricultural Science, 41(1), 23-31. http://doi.org/10.17503/agrivita.v40i0.1717.

Nuddin, A., Reskiana., Arman., S. Yusuf., Nuringsih., M. Arsyad., A. Bustan. & A. Laapo. (2018), Designing New Strategy for Enhancing Robusta Coffee Production: An Application of Interpretative Structural Modeling. International Journal Agriculture System. 6(2): 156-163. http://pasca.unhas.ac.id/ojs/index.php/ijas.

Nuddin, A., M. Arsyad, M.I. Putra, N. Nuringsih & T.T. Teshome (2019). Making the case for institutional support on designing agroforestry technology models for rehabilitating critical lands. Forest and Society. Vol. 3(1): 49-63, http://dx.doi.org/10.24259/fx.v3i1.5975.

Nuddin, A., M.H. Jamil., & A. Laapo., (2021). Strategi Pengembangan Agribisnis Hortikultura di Luwu Utara: Suatu Pendekatan Kelembagaan dan Eko Geografi. Jurnal Galung Tropika 10(1): 57-65.

Nurhapsa., A. Nuddin., Suherman & B. Barbara. (2020). Is Input Utilization Inelastic to Coffee Production? International Journal of Agriculture System. 8(1): 26-33. DOI: 10.20956/ijas.v8i1.2291.

Osorio, A. A., & A. Rivas. G, (2017), Contribution of Local Peasant Innovations to the re-cofiguration of Endegenous Rural Development. Journal Agronomia Colombiana. 35(3): 365-373. http://dx.doiorg/10.15446/agron.colomb.v35n3.63551.

Petra Hl´asn´a ˇCepkov´a., Michal J´agr., Dagmar Janovsk´a., V´aclav Dvoˇr´aˇcek., Anna Kotrbov´a Kozak., and Iva Viehmannov´a. (2021) Comprehensive Mass Spectrometric Analysis of Snake Fruit: Salak (Salacca zalacca). Journal of Food Quality. Volume 2021. https://doi.org/10.1155/2021/6621811

Rahman, S. A., Sunderland, T., Roshetko, J. M., & Healey, J. R. (2017). Facilitating Smallholder Tree Farming in Fragmented Tropical Landscapes: Challenges and Potentials for Sustainable Land Management. Journal of Environmental Management, 198, 110-121. https://doi.org/10.1016/j.jenvman.2017.04.047

Rizal, M., Wiryawan, B., Wisudo, S. H., Solihin, I., & Haluan, J., (2016), Institutional Development Strategy Through Interpretative Structural Modelling (ISM) for Gilinet Fisher Group in Basela Aceh, Indonesia. Journal AACL Bioflux. 9(4): 802-814. http://www.bioflux.com.ro/aad.

Rusydiana, A. (2018). Interpretive Structural Modeling Application for Cash Waqf Development Strategy in Indonesia. Journal of Islamic Economics and Business (Journal of Islamic Economics and Business), 4(1), 1. https://doi.org/10.20473/jebis.v4i1.9771

Salman, D., Kasim, K., Ahmad, A., & Sirimorok, N. (2021). Combination of Bonding, Bridging, and Linking Social Capital in a Livelihood System: Nomadic Duck Herders Amid the Covid-19 Pandemic in South Sulawesi, Indonesia. Regular Research Article, Forest and Society, 5(1), 136–158. https://doi.org/https://doi.org/10.24259/fs.v5i1.11813.

Santos, L. F., M. A. M, Ferreira., & A. P. T, de Campos, (2018). Rural Development and Family Agriculture in the Brazilian state of Minas Geraise in the Light of Multivariate Data Analysis. Interacões (Campo Grande) 19(4): 827-843. http://dx.doi.org/ 10.20435/inter.v19i4.1817.

Sri Hadiati ., T. Budiyanti., A. Soemargono & A. Susiloadi. (2012). Characterization of Fruit on Several Salak Varieties and Their Hybrids. Agrivita 34 (2): 187-192. http://dx.doi.org/10.17503/Agrivita-2012-34-2-p187-192.

Takeyasu, M., H, Nie., D, Gao & C, Chen, (2018). Local Action for Realizing Sustainable Society: A Survey of Japanese "Futurecity" Initiative. International Journal of Agriculture System, 6(2): 130-137. http://dx.doi.org/10.20956/ijas.v6i2.394

Widodo, E., & Hastuti. (2017). Kearifan Lokal dalam Mengelola Sumberdaya Lahan Pertanian di Lembah Sungai Sileng Purba Kecamatan Borobudur. Jurnal Ilmu-Ilmu Sosial, 14(1): doi 10.21831/socia.v14i1.19665

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