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Natural Silk Agribusiness Development Strategy in South Sulawesi Province, Indonesia

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Abstract. Natural silk is an agribusiness activity consisting of interconnected and interrelated upstream-to-downstream subsystems. It is one of the leading industries in South Sulawesi Province, the national silk-producing region. The government has launched various development programs and policies to increase natural silk production in South Sulawesi Province but has not achieved the expected targets. Therefore, this research analyzed natural silk agribusiness's internal and external environment to formulate alternative and development strategy priorities. The research was conducted in South Sulawesi Province, with a regional focus on Soppeng Regency and Wajo Regency in February – April 2024. The location selection was carried out by purposive sampling, considering that the area is the main priority in developing natural silk in South Sulawesi Province. The selection of respondents used a deterministic approach in the form of purposive sampling, with 41 respondents in the study. Eight experts filling out a pair comparison questionnaire determined the strategy's priority. The research method used is A'WOT Analysis. The research results show that eight alternative strategies were formulated. The main priority is optimizing policies and regulations from departments/agencies related to the development of natural silk, with a weight value of 0.160. It is hoped that all the results of formulating alternative strategies can be considered in developing natural silk agribusiness in South Sulawesi Province.

Keywords: agribusiness; A'WOT analysis; nature silk; strategic priorities

INTRODUCTION

Agribusiness is the total sum of all operations involved in manufacturing and distributing raw material supplies, agricultural production operations, and marketing and distribution of finished farm products (Davis & Goldberg, 1957). Likewise, natural silk is an agribusiness activity that consists of interconnected and interrelated upstream and downstream systems. The core process in natural silk consists of an upstream sub-system in the form of business activities for planting mulberries as caterpillar feed and silkworm breeding. At the same time, *on-farm* or production activities are rearing caterpillars to form cocoons that are ready to harvest. Moreover, activities in the downstream sub-system consist of spinning cocoons into silk thread, weaving them into silk cloth, and marketing the product to the end user. There are also supporting subsystems that help the continuity of the process in aspects of cultivation and aspects of the natural silk industry, such as credit institutions, research and development institutions, and extension institutions (Rusdi et al., 2021; Tenriawaru et al., 2021)). The process from mulberry cultivation to finished silk products and product marketing to final consumers combines actors from farmers, spinners, weavers, weaving entrepreneurs, cloth and sarong traders, caterpillar egg importers, as well as government stakeholders, including the Environment and Forestry Service, and the Industry Service, Trade & Cooperatives (Sadapotto et al., 2021).

South Sulawesi Province is one of the national producers of natural silk, contributing around 90% of silk thread production for all of Indonesia (Iwang, 2020). This is in line with the stipulation of South Sulawesi Province Regional Regulation Number 7 of 2018 concerning the South Sulawesi Province Industrial Development Plan for 2018-2038; as regulated in Article 6, it is stipulated that one of the leading industries of South Sulawesi Province is the textile and silk processing industry. Consists

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of the spinning, weaving, and natural silk finished product industries.

Silk activities in South Sulawesi Province have been integrated, starting with mulberry cultivation, silkworm rearing, thread spinning, weaving, and the ready-made clothing industry. Natural silk is one of the local wisdom assets that has been carried out by the people of South Sulawesi Province since the 1950s and has become a typical product that has high interest among the community to be used as a primary product in the form of sarongs, metered cloth, Bodo clothes, silk shirts, wallets. , bags, and various souvenirs made from silk (Muin & Isnan, 2019). (Sinaga et al., 2010) and (Ashar et al., 2022) state that natural silk is one of the strategic businesses to be developed because it has *backward linkage* And *forward linkage*, which is relatively long and can contribute to household income, so silk becomes a mainstay business worth developing.

According to (Sadapotto et al., 2021) from 24 districts, silk companies in South Sulawesi Province have been developed in 12 districts, namely Wajo, Enrekang, Bulukumba, Soppeng, Sidrap, Bone, Barru, Maros, Gowa, Toraja, Sinjai and Luwu districts. East. However, currently, the districts that are used as the main areas in the development of natural silk in South Sulawesi Province are Soppeng Regency, which is the centre for the development of mulberry plants, silkworm farming, and cocoon production in the upstream sub-system, and Wajo Regency as the centre for weaving and producing silk cloth in the sub-system downstream.

Natural silk agribusiness has several advantages throughout the production process, from upstream to downstream, placing it in a very strategic position. This agribusiness development offers enormous potential to have a broader impact on improving the economy and environment in South Sulawesi Province (Sadapotto et al., 2021). The development of natural silk has enormous potential to have a broader impact on improving the economy and environment of South Sulawesi, both in households and the regional economy (Ashar et al., 2023). (Muin & Isnan, 2019) stated that the existence of natural silk cultivation in South Sulawesi Province has been maintained for generations because there is still support from the government in establishing institutions such as silkworm cultivation groups. The government has also developed a program to support silkworm cultivation, including assistance with mulberry cuttings, seed assistance, production equipment machines, empowerment, marketing facilities, and capital.

In developing natural silk agribusiness, the government has a crucial role. The government is highly expected to overcome the problems of human resource quality, limited capital, limited facilities and infrastructure, low product quality, and technological limitations. Making policies is critical for the government to develop natural silk agribusiness (Ramdana et al., 2021; Tarigan et al., 2010). The government has intensified the natural silk development policy program in South Sulawesi Province through the regional superior industrial development plan. As a form of superior industrial development as stipulated in the 2018-2038 South Sulawesi Provincial Industrial Development Plan, the natural silk development strategy that has been developed to date takes the form of utilizing production forests, developing mulberry cultivation technology and methodology, building natural silk regional technical service units, strengthening the capacity and institutions of silkworm distributors, promoting investment in the silk spinning and weaving industry, developing and managing human resource capacity, applying and innovating technology, and developing natural silk MSMEs (Sadapotto et al., 2021).

However, various development programs and policies have been launched by the government to increase natural silk production in South Sulawesi Province but have not achieved the expected targets, the impact of which is that silk production has not

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been able to reach market demand and also the quality of the silk produced is still low. The policy never met the target because various reasons influenced it. The condition of each local silk sub-system in South Sulawesi Province has several problems that require more attention to survive and operate (Sadapotto et al., 2021). Natural silk in South Sulawesi Province is facing several issues, namely a decrease in the area of mulberry plantations which are being converted into land for other commodities, a reduction in the quality and quantity of cocoons, which is influenced by the condition of the silkworms used as primary material and can affect the quality and quantity of silk thread to be produced (Nuraeni, 2017).

Regional-based agribusiness development in an agribusiness industry by utilizing regional potential as the leading resource and maintaining environmental sustainability can be a regional development approach that aims to empower the actors involved and provide opportunities for transformation of the socio-economic structure of the region (Haris et al., 2023; Syafa'at et al., 2003). The development of natural silk agribusiness in South Sulawesi Province requires a comprehensive assessment of the conditions for the development of natural silk agribusiness in terms of mulberry cultivation as feed, silkworm cultivation to post-harvest and market mechanisms in particular in order to achieve superior industrial development plans. This research aims to analyze the internal and external environment of natural silk agribusiness to formulate alternative strategies and strategic priorities for developing natural silk agribusiness in South Sulawesi Province.

METHODS

The research was conducted in South Sulawesi Province, with a regional focus on Soppeng Regency and Wajo Regency. The location selection is done by *purposive sampling*, considering that this area is the main priority in developing natural silk in South Sulawesi Province. This research was conducted in February – April 2024. Primary data includes all data collected from original sources obtained through interviews, *Focus Group Discussion* (FGD), and filling out questionnaires for all respondents related to the formulation of the internal environment, external environment, and strategies for developing natural silk agribusiness, as well as direct observations at the research location. Meanwhile, secondary data is obtained from agencies and institutions related to research and other supporting data in journals, articles, books, research reports, and other sources.

The selection of respondents used a deterministic approach in the form of *purposive sampling*, considering that the respondents in this research are all actors involved in developing natural silk agribusiness in South Sulawesi Province. The selected respondents were supposed to have in-depth experience and knowledge and were involved in natural silk agribusiness in South Sulawesi Province. The number of respondents in the research was 41 people consisting of research involved 41 respondents consisting of mulberry and silkworm cultivation farmers (10 people), spinners (5 people), weavers (5 people), natural silk business owners (2 people), Bappelitbangda Provincial South Sulawesi (1 person), Provincial LHK Service. South Sulawesi (1 person), Provincial Department of Industry and Trade. South Sulawesi (1 person), BPSKL Provincial South Sulawesi (1 person), Indonesian National Bank (BNI) (1 person), SSC (1 person), Bappelitbangda Soppeng Regency (1 person), Soppeng District Agriculture Service (1 person), DPPK & UKM Soppeng Regency (1 person), Bappelitbangda Soppeng Regency (1 person), Wajo Regency Disperindagkop (1 person), Extension agents (5 people), Academics (1 person), and Consumers (2 people). Meanwhile, experts, including Provincial Development Planning and Research and Development Agency representatives, filled out the special strategy priority questionnaire. South Sulawesi, Wajo

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Regency Regional Development Planning, Research and Development Agency, Soppeng Regency Regional Development Planning, Research and Development Agency, *Silk Solution Center*, Silk Farmers Group, Silk Craftsmen Group, Silk Entrepreneurs and Academics.

This research uses A'WOT analysis. A'WOT analysis results from a combination of AHP and SWOT analysis tools. The results of the A'WOT analysis are expert perceptions that can be used to formulate development plans and strategies (Bottero et al., 2019). The stages of A'WOT analysis can be described in the following stages:

1. Identification *goals* or desired development goals
2. Identify SWOT factors to find out the strengths, weaknesses, opportunities, and threats of development
3. Formulate the strategy by matching internal and external factors. Internal and external factors are data obtained from the input stage. The analysis tool used at this stage is the SWOT matrix.
4. Develop a hierarchical structure from the problem/goal to be resolved to the choice of strategy. The highest level is the goal or focus of the problem being studied, the second level is the SWOT group, the factors connected to each SWOT group are described at the third level, and the final level is the choice of strategy related to all SWOT factors—calculation of pairwise comparisons using *software Expert Choice V11*.
5. After the A'WOT hierarchical structure has been arranged, pairwise comparisons are made between each SWOT factor (criterion). *Strengths, weaknesses, opportunities, and threats*). This comparison is carried out to determine the weight that shows each factor's level of importance or influence in the SWOT group. This stage follows the provisions of the A'WOT hierarchy: pairwise comparisons between factors (criteria) first, pairwise comparisons of subfactors in the SWOT group, and pairwise comparisons of alternative strategies based on each SWOT subfactor.
6. Formulate alternative strategies using the SWOT matrix by matching internal and external factors. The strategy with the most significant amount of weight is the top priority.

RESULTS AND DISCUSSION

Internal and External Environment Analysis

Environmental analysis includes the internal and external environment, where the internal environment consists of variables of strengths and weaknesses that exist in a business area and are sourced from the business area itself. The internal environmental analysis consists of several aspects, namely production, human resources, marketing, finance, and institutions, as well as communication structures, authorities, workflows, and norms that can directly affect the internal environmental conditions. Meanwhile, the external environment includes opportunities and threats analyzed based on political, legal, economic, social, technological, and work environment aspects (Hunger & Wheelen, 2003). Based on the analysis carried out, it can be known that the grouping of environmental analysis in the development of natural silk agribusiness can be seen in **Table 1.**

SWOT Matrix and Strategy Development

A combination of strengths and opportunities is needed to minimize weaknesses and face threats. Table 2 shows eight recommendations for alternative strategies (AS) for developing natural silk agribusiness in South Sulawesi Province based on the SWOT matrix. Alternative strategies are:

S-O Strategy (Strengths – Opportunities)

All strength factors are used to obtain a strategy that can take advantage of opportunity factors, namely:

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Increased production by utilizing infrastructure in all-natural silk processes (S1, S3, S5, O1, O3, O4)

Infrastructure in natural silk consists of caterpillar houses for cultivating silkworms and technology used in the downstream process of producing natural silk products. The infrastructure for cultivating natural turtles currently needs to be in better condition to produce quality cocoons and the quantity by the expected demand. Farmers cultivate silkworms under their houses, where the conditions are different from the standard provisions that should be in cultivating silkworms. There is assistance from the government in several caterpillar housing units, but more is needed to help the farmers' overall cultivation process.

Table 1. Environmental analysis of natural silk agribusiness in South Sulawesi Province

Internal Environment	**External Environment**
Strengths	***Opportunities***
1. Regional leading industries 2. Community hereditary activities 3. Demand for silk products is high 4. Distributor of silk fabrics outside South Sulawesi 5. Diversified end products	1. The amount of government contribution and support in development 2. Typical culture of the community 3. The geographical conditions of the region support the cultivation of mulberries and silkworms. 4. Innovation in the manufacturing process of silk products 5. High-selling prices for various types of silk products
Weakness	***Threats***
1. Decrease in the number of mulberry farmers and silkworms 2. Decrease in the area of mulberry cultivation land 3. Decrease in the number of weavers 4. Farmers have difficulty obtaining silkworm eggs 5. The quality and quality of local silkworm eggs is low 6. Institutions in nature silk have not been maximized	1. Uneven distribution of government assistance 2. Competition with Chinese silk products 3. Unstable selling price of cocoons 4. Dependence on the use of imported silkworm eggs 5. The use of imported silk yarn and silk substitution-silk yarn is increasing.

Source: Data processed, 2024

Meanwhile, technology still needs to be improved in creating quality products in the downstream sub-system processes of natural silk, in the form of spinning, weaving, dyeing of silk fabric, and creating products in various shapes. Technological assistance from the government is in the form of large-scale spinning equipment, which is given to be distributed and allocated to spinning players, although currently, the equipment is not being used as intended, so optimization is needed by the government in coordination with spinning players. Meanwhile, in the downstream sub-system activities of weaving to the creation of a variety of silk products, not all silk weavers have implemented advanced technology that supports large production quantities and good quality, so technology optimization is also needed in collaboration between silk weavers and silk entrepreneurs and the role of the government is necessary so that this can be achieved. It is creating diverse silk products of high value.

W-O Strategy (*Weaknesses-Opportunities)*

Alternative WO strategies can be implemented to reduce the effects of several

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weaknesses by utilizing existing opportunity factors. The WO strategy consists of:

1. Developing and producing local silk egg seeds (W4, W5, O1, O2, O3)

Silkworm eggs are the leading and most important raw material in natural silk agribusiness. In the past, silk farmers in South Sulawesi Province could produce quality local silkworms, suitable cocoons, and silk thread. However, since the febrile epidemic entered and attacked local caterpillars produced by farmers, farmers have started importing silkworms from China to continue their natural silk cultivation. Apart from imports, reserve silkworm seeds are produced by BPSKL Prov. South Sulawesi, however, there are many things that farmers consider when using these caterpillar seeds, mainly because the condition of the caterpillar seeds is declining due to storage that does not comply with the provisions in the process of sending silkworm eggs to farmers.

With government support in developing natural silk in South Sulawesi Province, farmers want to return to trying to produce local silkworm seeds because the geographical conditions are very supportive in designing and producing silkworm seeds and also because silk is a cultural characteristic of the community. Where farmers have the ability and experience in natural silk, making it possible to produce local silkworm seeds.

2. Utilization of resources found in natural literature (W1, W2, W3, W4, O1, O2, O3, O4)

Utilization of resources in natural literature focuses on optimizing human, natural, and technological resources. The current conditions, namely the decline in the number of silk farmers and weavers, have resulted in the productivity of natural silk in South Sulawesi Province needing to be more optimal. The decline in natural silk actors is due to the lack of regeneration of each activity actor. Young people's interest in natural silk is shallow due to the opinion that the activities involved in natural silk are challenging, require special skills, and cannot provide profits commensurate with the energy expended. So, policies and regulations from the government are needed to create programs for regeneration and attract young people's interest in natural literature.

Meanwhile, natural resources and technology are also very much needed to develop natural silk. Supportive geographical conditions can cover the problem of decreasing mulberry cultivation land so that mulberry cultivation activities can continue. Moreover, innovation that continues to develop can help realize resource optimization, which will later impact increasing local silk production.

3. Strengthening the institutional role of each relevant actor (W1, W3, W6, O1, O3)

Support from institutions in development is vital to ensure the productive activities of each actor involved through increasing knowledge, training, providing information, and developing natural literature. Efficient institutions can significantly increase the independence of every actor in natural silk activities. Institutions in natural silk in South Sulawesi Province consist of silk farmer groups in the upstream sub-system and silk artisans groups in the downstream sub-system. The current condition of silk farmer groups could be more optimal, where only a few silk farmer groups are still active, and the number of active group members is only 2-3 people/group. This can happen due to a need for more socialization and strengthening the role of groups for farmers so that they are more active as individual farmers. On average, silk farmer groups only act as facilitators or connectors in the distribution of aid from the government. However, based on conditions in the field, this assistance could have been better distributed to farmer group members.

Meanwhile, the silk artisans group is currently running well because the formation and arrangement of the structure and duties of the silk artisans group are directly under and supervised by the Wajo Regency Service. However, artisans in Soppeng Regency are

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still individual businesses; there must be direct institutional support. Therefore, there is still a need to strengthen the institutional role of each natural silk sub-system in South Sulawesi Province, especially in silk farmer groups.

S-T Strategy (Strengths – Threats)

This strategy brings together interactions between identified external threats by using existing strength factors to overcome the threats. The ST strategy formulated is:

1. Improving the quality of local silk products (S1, S2, S3, S4, T2, T4, T5)

Local silk products from South Sulawesi Province currently have a quality that supports demand in national and international markets. However, with the existence of competing silk products from other countries, such as India and China, which have good quality but relatively cheaper prices, the condition of the local silk market in South Sulawesi Province needs to be corrected. Local silk products currently have relatively high prices, and the target market is the upper middle class, so the lower middle market prefers to buy substitute silk products or Chinese silk products.

Farmers and silk businesses still use imported materials in the form of imported silk worms and threads to run silk agribusiness. There are social conditions in the form of community experience that can help silk farmers and entrepreneurs create and produce quality local silk. With the knowledge and cultural factors of the people of South Sulawesi Province regarding natural silk, the quality of local silk products can increase, and prices that match the quality they create can compete with silk products from other countries.

2. Strengthening policies and regulations from departments/agencies related to the development of natural silk (S1, T1)

Natural silk is one of the leading sectors in South Sulawesi Province, and its main focus is regional economic development. The South Sulawesi Provincial Government aims to "Returning the Glory of Silk to South Sulawesi Province" per the Industrial Development Plan for 2018-2038. To achieve this goal, provincial and district governments have formulated various policies and regulations supporting natural silk development. In the form of superior industrial development as stipulated in Regional Regulation no. 7 of 2018 concerning the South Sulawesi Province Industrial Development Plan for 2018–2038, the natural silk development strategy that has been developed to date in the upstream sub-system is in the form of utilization of production forests, development of mulberry cultivation technology and methodology, construction of natural silk regional technical service units, strengthening capacity and institutionalization of silkworm distributors, providing assistance with mulberry tree seeds to increase production and in the downstream sub-system in the form of investment promotion in the silk spinning and weaving industry, development and management human resource capacity, technological application and innovation, as well as the development of natural silk MSMEs.

However, the development policy strategies and programs that have been prepared do not achieve the desired goals because these policies are not distributed and implemented well among all actors in natural silk; there is a lack of coordination and supervision of the implementation of policy programs between *stakeholder* is one of the main factors in the failure to achieve development goals. So, there is a need for an essential and strengthening role in the form of coordination and cooperation as well as evaluation of policy and regulatory programs from each provincial and district government agency involved in developing natural silk agribusiness in South Sulawesi Province.

W-T Strategy (Weaknesses-Threats)

The W-T alternative strategy can minimize losses from weaknesses while avoiding future threats. The WT strategy formulated is:

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1. Stabilization of selling and purchasing prices for silk farmers (W1, W2, T1, T3, T4, T5)

One of the reasons for the decline in the number of mulberry and silkworm farmers and the conversion of mulberry land to land for other commodities is that farmers feel that mulberry and silkworm cultivation is less profitable. This happens because the selling and buying prices of cocoons are unstable, tend to be low, and do not provide profits for farmers. Apart from that, the import of raw materials also affects the decline in income received by farmers. In the field, on average, if farmers want to get imported silkworm seeds, even though the seeds are free because they are government assistance, farmers have to pay the costs of handling and storing the caterpillar seeds to the importer so farmers feel that this is one of the reasons low net income received by farmers. So, a critical policy is needed to determine silk farmers' selling and buying prices.

2. Strengthening policies in the upstream silk sector in an integrated and comprehensive manner (W1, W2, W3, W4, W4, W5, T1, T3, T4, T5)

Policies and regulations in the upstream sub-system of natural silk are crucial. Activities in the upstream sub-system are the primary basis of natural silk because the results of this stage directly influence the results of the next stage. The condition of the upstream sub-system of natural silk still needs to achieve the desired development goals.

There is a need to strengthen policies and regulations that regulate all aspects of the upstream natural silk sub-system, including human resources, natural resources, and technology. Suppose these policies and regulations can be optimized comprehensively and integrated. In that case, all activities related to natural silk in South Sulawesi Province have the potential to achieve the expected development goals.

Table 2. SWOT Matrix for the development of natural silk agribusiness in South Sulawesi Province

Internal	***Strengths***	***Weakness***
	1. Regional leading industries 2. Community hereditary activities 3. Demand for silk products is high 4. Distributor of silk fabrics outside South Sulawesi 5. Diversified end products	1. Decrease in the number of mulberry farmers and silkworms 2. Decrease in the area of mulberry cultivation land 3. Decrease in the number of weavers 4. Farmers have difficulty obtaining silkworm eggs 5. The quality and quality of local silkworm eggs is low 6. Institutions in nature silk have not been maximized
External		
Opportunities	**S-O STRATEGY**	**W-O STRATEGY**
1. The amount of government contribution and support in development 2. Typical culture of the community 3. The geographical conditions of the region support the cultivation of mulberries and silkworms. 4. Innovation in the manufacturing process of silk products 5. High-selling prices for various types of silk products	1. Increased production by utilizing infrastructure in all-natural silk processes (S1, S3, S5, O1, O3, O4)	2. Developing and producing local silk egg seeds (W4, W5, O1, O2, O3) 3. Utilization of resources found in natural literature (W1, W2, W3, W4, O1, O2, O3, O4) 4. Strengthening the institutional role of each relevant actor (W1, W3, W6, O1, O2)
Threats	**S-T STRATEGY**	**W-T STRATEGY**
1. Uneven distribution of government assistance 2. Competition with Chinese silk products 3. Unstable selling price of cocoons 4. Dependence on the use of imported silkworm eggs 5. The use of imported silk yarn and silk substitution-silk yarn is increasing.	5. Improving the quality of local silk products (S1, S2, S3, S4, T2, T4, T5) 6. Strengthening policies and regulations from departments/agencies related to the development of natural silk (S1, T1)	7. Stabilization of selling and purchasing prices for silk farmers (W1, W2, T1, T3, T4, T5) 8. Strengthening policies in the upstream silk sector in an integrated and comprehensive manner (W1, W2, W3, W4, W5, T1, T3, T4, T5)

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1. Hierarchy Structure

Based on the A'WOT method, an AHP hierarchical structure was prepared, which includes SWOT components, which can be seen in **Figure 1**. The AHP hierarchy is helpful as a basis for respondents to make weighting simpler (Rainy & Widayanto, 2019). The hierarchical structure will consist of goals, with this study aiming to obtain a strategy for the development of natural silk agribusiness in South Sulawesi Province. At the second level, some criteria include strengths, weaknesses, opportunities, and threats. The third level contains sub-criteria that include the sub-factors of each SWOT component. The fourth level is an alternative strategy formulated through the SWOT matrix in **Table 2**.

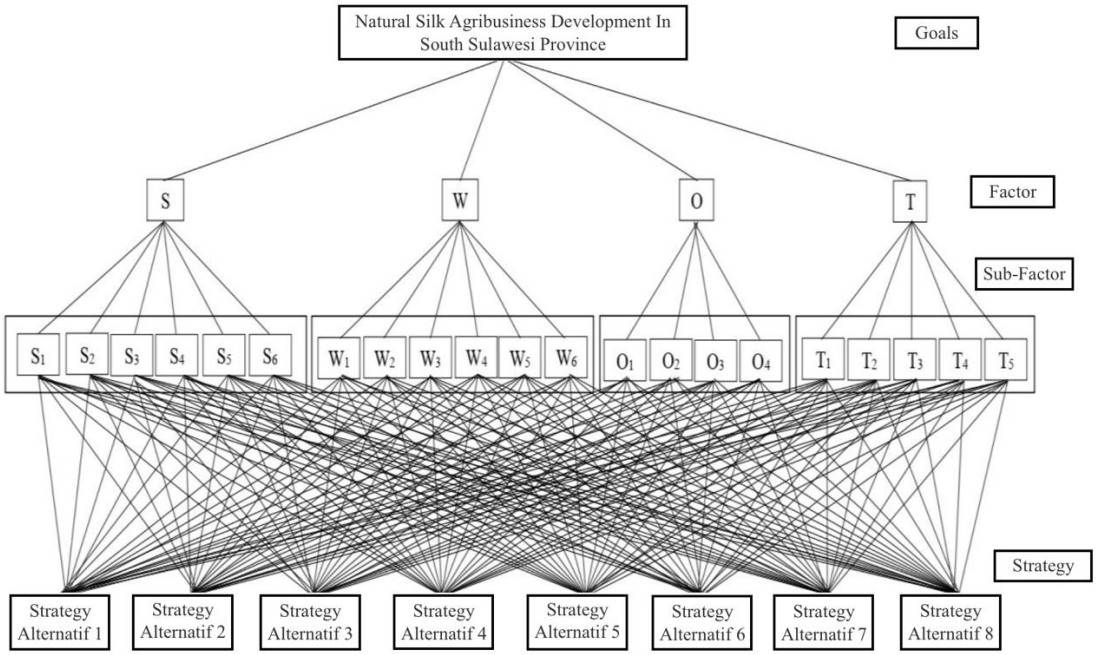

Figure 1. A'WOT hierarchy of natural silk agribusiness development in South Sulawesi Province

2. Pair Comparison

Weighting in pairwise comparisons is carried out after constructing a hierarchy, as in **Figure 1**. The first pairwise comparison carried out was a pairwise comparison between SWOT factors consisting of strengths (*strengths)*, weaknesses (*weaknesses)*, chance (*opportunities)*, and threats (*threats)*. Based on the comparisons carried out, the results obtained were that among the four SWOT factors, the opportunity factor (0.381) was the factor that was considered the most important, followed by the strength factor (0.357), the weakness factor (0.148) and the threat factor (0.114). The Mark *inconsistency ratio* of the comparison at this level is 0.03, which means that the assessment meets the requirements for paired comparison, where there is a provision that if the value *inconsistency ratio* is more than 0.1 (10%), then the results are inconsistent (Nastiti, 2019).

The following pairwise comparison is a comparison between levels of SWOT sub-factors. Based on the comparison that has been carried out, it can be seen that the subfactor that has the highest weight value of the strength factor is the high demand for silk products (0.267). There is enormous demand for silk products, both national demand and world demand, according to data obtained from (the International Sericultural Commission 2022) and (the International Sericultural Commission 2022), which states that every year, demand for silk increases by 5%. The high demand for silk products can

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provide a market opportunity for natural silk players in South Sulawesi Province to create silk products that can be sold.

The weakness sub-factor with the highest weight value is that farmers have difficulty obtaining silkworm eggs (0.249). Silkworm eggs are the primary input in natural silk agribusiness. Because silkworm eggs are difficult to obtain, activities in natural silk will become disorganized and influence each other between the activities within it. The primary source of silkworm eggs available to farmers is imported eggs. However, their availability is still limited and could affect farmers' cocoon production. The only source of local silkworm eggs that farmers can obtain is caterpillar eggs produced by BPSKL Prov. South Sulawesi.

A pairwise comparison of opportunity factors shows that the opportunity with the highest weight is the amount of government contribution and support in development (0.340). With significant contributions and support from the government, the chance to develop natural silk in South Sulawesi Province is enormous so that it can achieve the expected goals. The provincial government coordinates with several agencies within the province to create and formulate policies and regulations related to the development of natural silk, and it focuses on the development areas of the two central silk centre districts, namely Soppeng Regency and Wajo Regency. Furthermore, the district government is conducting further research and studies regarding the condition of natural silk in these areas. The aim is to ensure that the policies, regulations, and programs that will be formed and the assistance that will be provided are following the conditions of the field.

According to (Iwang, 2020), government support is made by Regional Regulation no. 7 concerning the 2018-2038 Provincial Industrial Development Plan, which makes natural silk a superior product, and the program is designed to involve many stakeholders, namely the government, farming communities, craftsmen and entrepreneurs, academics, NGOs and the media.

Pairwise comparison of the threat sub-factor with the highest value, namely the use of imported silk thread and non-silk substitute thread, increased (0.245), which occurred because local silk thread produced by weavers could not reach the quantity expected by silk entrepreneurs to grow with targets according to market demand. The quality of local silk thread differs from that of imported silk thread. Silk products that use 100% genuine silk thread have high prices and are aimed at the upper-middle-class market. However, because demand for silk is also high among lower-middle-class consumers, silk entrepreneurs are developing products using substitute threads at more affordable prices. According to (Sadapotto et al., 2021), imported silk and non-silk yarns increasingly dominate the woven market. The percentage of sales of local silk thread has decreased significantly while imported thread has increased. The condition of dependence on imported yarn has an indirect impact on independent weavers and small-scale weaving entrepreneurs.

The following pairwise comparison is to weight the pairwise comparison of alternative strategies based on each SWOT sub-factor to determine the priority of the approach taken when adjusting the interests of each sub-factor (**Table 3**). From all the sub-factors in the factors of strength, weakness, opportunities, and threats, strengthening policies and regulations from agencies/agencies related to developing natural silk is a priority strategy.

3. Priority Strategy

The primary priority strategy based on the overall hierarchical structure is AS 6, or strengthening policies and regulations from departments/agencies related to developing natural silk (0, 162). The second priority strategy is to improve the quality of local silk products (AS 5) (0, 144). The third priority strategy is strengthening policies in the upstream silk sector in an integrated and comprehensive manner (AS 8) (0, 133).

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Furthermore, the fourth priority strategy is AS 3, or utilizing resources found in natural silk (0.124), and the fifth is AS 1, or developing and producing local silk egg seeds (0.121).

Table 3. Pair comparison in SWOT sub-factor level

Factor	IR	SWOT Subfactor	Weight	Priority
Strengths	0.04	1. Regional leading industries	0.204	2
		2. Community hereditary activities	0.156	3
		3. Demand for silk products is high	0.267	1
		4. Distributor of silk fabrics outside South Sulawesi	0.062	5
		5. Diversified end products	0.099	4
Weaknesses	0.02	1. Decrease in the number of mulberry farmers and silkworms	0.201	3
		2. Decrease in the area of mulberry cultivation land	0.146	4
		3. Decrease in the number of weavers	0.120	5
		4. Farmers have difficulty obtaining silkworm eggs	0.249	1
		5. The quality and quality of local silkworm eggs is low	0.234	2
		6. Institutions in nature silk have not been maximized	0.050	6
Opportunities	0.03	1. The amount of government contribution and support in development	0.340	1
		2. Typical culture of the community	0.212	3
		3. The geographical conditions of the region support the cultivation of mulberries and silkworms	0.210	5
		4. Innovation in the manufacturing process of silk products	0.211	4
		5. High-selling prices for various types of silk products	0.238	2
Threats	0.01	1. Uneven distribution of government assistance	0.203	3
		2. Competition with Chinese silk products	0.217	2
		3. Unstable selling price of cocoons	0.133	5
		4. Dependence on the use of imported silkworm eggs	0.202	4
		5. The use of imported silk yarn and silk substitution-silk yarn is increasing	0.245	1

Source: Data processed, 2024

The sixth priority order is improving infrastructure in the entire natural silk process (AS 2) (0.114), the seventh priority order is stabilizing selling prices and purchasing prices for silk farmers (AS 7) (0.107), and the last priority is AS 4 or strengthening the institutional role of each relevant actor (0.096). The priority order of development strategies can be seen in **Table 4**. It is prepared by considering and comparing the importance of each component in the A'WOT hierarchical structure and remembering that there are limitations in implementing all strategies simultaneously.

Table 4. Priorities for the development strategy of natural silk agribusiness in South Sulawesi Province

Code	Alternatif Strategy	Weight	Priority
AS1	Increased production by utilizing infrastructure in all-natural silk processes	0.114	6
AS2	Developing and producing local silk egg seeds	0.121	5
AS3	Utilization of resources found in natural literature	0.124	4
AS4	Strengthening the institutional role of each relevant actor	0.096	8
AS5	Improving the quality of local silk products	0.144	2
AS6	Strengthening policies and regulations from departments/agencies related to the development of natural silk	0.162	1
AS7	Stabilization of selling and purchasing prices for silk farmers	0.107	7
AS8	Strengthening policies in the upstream silk sector in an integrated and comprehensive manner	0.133	3

Source: Data processed, 2024

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Based on considerations and weight calculations from the average results of pairwise comparisons that have been carried out, the alternative strategy that is the main priority in developing natural silk in South Sulawesi Province is the AS 6 strategy or strengthening policies and regulations from agencies/agencies related to the development of natural silk (0, 162). With the strategy of strengthening policies and regulations from agencies/agencies associated with developing natural silk, it is hoped that all activities in natural silk can run smoothly and achieve the desired goals. South Sulawesi Province has a leading program in natural silk, namely "Restoring the Glory of Silk in South Sulawesi Province." To achieve the success of this program, the best agencies/departments at both provincial and district levels are expected to be able to formulate and create appropriate policies and regulations so that they can be implemented by all-natural silk actors who contribute to achieving the goal of restoring the glory of silk. This is in line with (Ramdana et al., 2021), which states that in the strategy for developing natural silk, the role of government is vital in making policies that will support and help utilize the potential of the region and society.

Entire Actors involved in natural silk play an essential role in achieving strategies to strengthen policies and regulations from agencies/agencies related to the development of natural silk, both for existing policies and rules prepared in the Regional RPJMD and the latest guidelines and regulations, which will later be prepared by alternative strategies which are obtained. According to Saadah (2024), regional governments, through regional autonomy, are given greater authority in managing regional industrial potential. The government can make policies and plans more appropriate to the conditions and uniqueness of the region by allocating a larger budget for infrastructure development, promotion, and environmental preservation that supports developing regional industrial potential. With the strategy to strengthen policies and regulations from agencies/agencies related to the development of natural silk, natural silk in South Sulawesi Province can achieve growth and be sustainable. Therefore, this strategy is considered the most crucial strategy if there are limitations in implementing all strategies simultaneously and the strategy is long-term.

CONCLUSION

Priority strategies that can be implemented in the development of natural silk agribusiness in South Sulawesi Province, starting from the first to eighth priorities, are: i) strengthening policies and regulations from agencies/agencies related to the development of natural silk; ii) improving the quality of silk products; iii) strengthening policies in the upstream silk sector in an integrated and comprehensive manner; iv) utilization of resources contained in natural silk; v) developing and producing local silk egg seeds; vi) increasing production by utilizing infrastructure in all-natural silk processes; vii) stabilization of selling and purchasing prices for silk farmers; and viii) strengthening the institutional role of each relevant actor.

The results of formulating alternative strategies can be considered in developing natural silk agribusiness in South Sulawesi Province as a driver for increasing natural silk production. Moreover, there is a need for synergy between provincial governments, regional governments, related agencies/departments, silk farmers, spinners, weavers, entrepreneurs, associations, and universities to support the implementation of natural silk development strategies.

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