

Weaving Collaboratively for Competitiveness: Revitalizing Sumbawa's Weaving Industry

Ninik Probosari¹(⊠), Andi Kusmayadi², Ari Wijayani¹, Kartika Ayu Ardhanariswari¹, Ilham Ramadan Pandu Setia Negara Siregar³, and Ari Okta Viyani³

Abstract. This study focuses on developing the weaving industry in Sumbawa Regency using the One Village, One Product (OVOP) approach. The aim is to identify and address the weaknesses in the association of weaving craftsmen, the people's weaving trade system, production facilities and infrastructure, and capital and business management. The researchers utilized the Triple Helix Communication Model, a qualitative descriptive research method, stakeholder analysis, SWOT analysis, and Delphi analysis to formulate a strategy for developing the Sumbawa weaving industry. The results indicate that a strong association of weaving craftsmen, improved trade systems, better production facilities and infrastructure, and increased access to capital and business management knowledge are critical to enhancing the competitiveness of the weaving industry. The implication of this study is that a more coordinated and collaborative approach involving stakeholders can lead to the successful development of the weaving industry in Sumbawa Regency.

Keywords: Sumbawa weaving \cdot one village one product \cdot triple helix \cdot development strategy

1 Introduction

1.1 Background

The weaving industry makes a major contribution to the national economy. The weaving industry can be a driver of the people's economy and a contributor to foreign exchange, especially in export destination countries such as Japan, the Netherlands, and United States. The Ministry of Industry noted that Indonesia's weaving commodity exports reached US\$53.3 million or around Rp752 billion throughout 2018. The government is committed to increasing the productivity and innovation of the weaving Small and Medium Industries. Indonesia has the advantage of creative craftsmen and cultural

wealth. Most of the woven fabrics and batik makers in Indonesia are small entrepreneurs from various industrial centers. It is recorded that there are 368 weaving industry centers spread across almost all regions of the archipelago.

The Province of West Nusa Tenggara (NTB) is one area rich in the weaving industry. NTB has enormous industrial potential, especially in the woven fabric industry, one of NTB's leading products. NTB is one of the leading participants in the Muslim fashion exhibition made from weaving which was held in 2020. One of the districts in NTB that has the potential for weaving as a local specialty product is Sumbawa Regency. Sumbawa Regency has 16 textile industry centers with 383 business units. The potential of Sumbawa weaving is centered in Poto Village, Moyo Hilir District, Sumbawa Regency. In this village, there are 62 weaving craftsmen. This number has decreased every year. This decrease was due to the market's low competitiveness of woven products. This low competitiveness is due to several factors, including the quality of weaving, packaging, and uncertain weaving prices.

There are several problems related to the non-optimal weaving industry in Sumbawa, including: first, the weakness of the association of weaving craftsmen. The bargaining position of the weaving artisan community is very weak in the construction of the weaving trade system because it does not yet have a strong representative institution and fights for the interests of the crafter. Individual weaving farmers are weak in terms of the quality of education and inadequate capital for production facilities and infrastructure, limited capital, and business management.

Second, the weakness of the people's weaving trade system. The weaving trade system is inseparable from 3 main things that are often a problem for weavers: price, quality, and distribution. Prices at the level of weavers fluctuate and tend to harm the crafters. The production of Sumbawa weaving craftsmen has not been able to penetrate the potential market area due to limited access and the strong network of inter-island traders. This problem can clog the distribution of Sumbawa weaving, and prices drop due to not being competitive in terms of quality and price.

Third, inadequate production facilities and infrastructure. The production facilities of traditional weaving craftsmen incur high costs. This condition is coupled with inadequate infrastructures, such as damaged roads. Weaknesses in road infrastructure result in high production costs and have an impact on less competitive selling prices.

Fourth, limited capital and business management. Weaving craftsmen have difficulty accessing banking institutions, which causes many weaving craftsmen to be trapped in the pattern of moneylenders. Limited capital also makes it difficult for weaving craftsmen to invest in technology to improve productivity and quality and minimize costs. This condition results in the cost of traditional management patterns tending to be high. Small business scale, low productivity, and quality result in low selling prices for Sumbawa weaving.

Based on the potential and complexity of the problems faced by the Sumbawa Regency Government related to weaving production, to make weaving one of the superior products of the NTB region, it is necessary to have an appropriate development strategy for this Sumbawa weaving. Therefore, the Sumbawa Regency Government needs to implement an effective strategy by utilizing its internal strengths, namely its

opportunities and strengths, by considering external threats and weaknesses to develop Sumbawa weaving products.

In addition, an innovation-based approach is needed to develop the Sumbawa weaving economy from production to marketing to better market competitiveness. With the One Village One Product (OVOP) approach based on local economic development, it is expected to strengthen regional products to develop and be competitive in the market.

In Indonesia, there are about 74,000 villages that have uniqueness or characteristics, one of which is Poto village, Moyo Hilir District, Sumbawa Regency, where about 65% of the population is still classified as poor/low income, and the majority of these villages exist in the agricultural sector. With this culture, it is very potential to develop an OVOP program. It is necessary to map the potential of the region, as well as the strengths, weaknesses, opportunities, and threats faced by developing superior regional products with the OVOP approach to have added value and competitiveness. This mapping will be used to determine the strategy for developing the Sumbawa weaving industry.

In this study, the authors use the Triple Helix communication model, which involves elements of the government (Bappeda and the Department of Industry & Trade, Cooperatives and SMEs), academics, and weaving craftsmen. It is hoped that with the involvement of these 3 parties, the strategy for developing competitive Sumbawa weaving will be more precise and measurable.

This research is important because of the conditions in Sumbawa Regency that need universities to be involved in helping the development of Sumbawa's weaving potential. The Sumbawa Regency Government wants to develop woven products that are superior to regional products to have competitiveness. So far, the role of universities is still very minimal, so a deeper involvement of universities is needed to help them prepare for competitive Sumbawa weaving.

1.2 Importance of the Problem

In specific, the problem lies in (1) the weakness of the association of weaving craftsmen, (2) the weakness of the people's weaving trade system, (3) inadequate production facilities and infrastructure, and (4) limited capital and business management. The OVOP-based weaving development strategy with a triple helix communication model is very important to becoming a director for competitive Sumbawa weaving development.

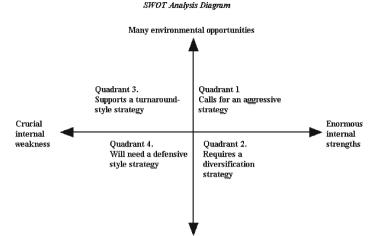
1.3 Research Question

Based on the background above, the research question is as follows:

1) What is the strategy for developing Sumbawa weaving based on the OVOP approach with a triple helix communication model toward competitive Sumbawa weaving?

1.4 Research Objective

Based on the research question above, the research objective is as follows:



Grave environmental threats

Fig. 1. SWOT Diagram

 Analyzing the development of Sumbawa weaving and designing a strategy for developing Sumbawa weaving based on the OVOP approach with a triple helix communication model to optimize weaving management so that it has competitiveness.

1.5 Research Limitation

The authors make sure to make the research limitation. This study's research limitation focuses on data collected from the Sumbawa Regency government, academics, and all weaving industry.

2 Literature Review

2.1 SWOT Analysis dan Development Strategy

According to Rangkuti (2013: 198 [1]), SWOT analysis systematically identifies various factors to formulate a business strategy. This analysis is based on a logic that can maximize strengths and opportunities and minimize weaknesses and threats. Meanwhile, according to Siagian (2012: 172 [2]), SWOT analysis is a powerful instrument for conducting a strategic analysis. Its efficacy lies in the ability of the company's strategy makers to maximize the role of strength factors and minimize weaknesses in the organization and reduce the impact of threats that arise and must be faced. SWOT analysis is described in a SWOT diagram model to facilitate data analysis. The SWOT diagram can be described in Fig. 1.

Based on the picture above, the SWOT analysis compares the external factors of opportunities and threats with the internal factors of strengths and weaknesses. *Quadrant 1*: A very favorable situation. This favorable situation is because an organization or company has opportunities and strengths to take advantage of existing opportunities.

The strategy that must be applied in this condition is to support an aggressive growth policy (*Aggressive Strategy*). *Quadrant 2*: Companies that face various threats but still have internal strength. The strategy that must be applied is to use strength to take advantage of long-term opportunities using a product/market diversification strategy (*Diversification Strategy*). *Quadrant 3*: The company faces a huge market opportunity but experiences some internal constraints/weaknesses. The focus of this company's strategy is to minimize the company's or organization's internal problems to seize better market opportunities (*Turnaround Strategy*). *Quadrant 4*: In a very unfavorable situation, the company or organization faces various internal threats and weaknesses (*Defensive Strategy*).

2.2 One Village One Product (OVOP) Approach

The OVOP approach was first initiated in Oita, Japan. OVOP is an approach to developing regional potential in one region to produce products that can compete in the global market while still having the region's unique characteristics. The OVOP program has been successfully developed in several Asian countries, such as Japan and Taiwan, and has now been declared a national movement in Indonesia. The implementation of OVOP in Indonesia has been implemented through the Ministry of Industry program since 2008 to develop the potential of Small and Medium Industries in various sectors. Implementing this program is expected to improve the population's welfare by optimizing local resources' potential to compete in the global market (M. Triharini et al., 2014 [3]). OVOP is expected to be able to strengthen regional products so that they can develop and be competitive in the market. The objective of the OVOP program is to build sustainable activities through expanding market access produced by each village/region. The success will increase farmers' and business community's income and welfare.

2.3 Triple Helix Communication Model

Conceptually, the triple helix is defined as an approach that shows innovation emerges from the existence of reciprocal, balanced, and sustainable relationships between business people, academia, and government and how they transform through these relationships (Etzkowitz, 2014 [4]; Etzkowitz & Viale, 2010 [5]; Leydesdorff, 2012 [6]). The triple helix model emerged as a framework for analyzing knowledge-based innovation systems that emphasizes the multiple and reciprocal relationships between the 3 main actors in the process of knowledge creation and capitalization (Lombardi et al., 2012 [7]). The triple helix model considers the structure of reciprocal relationships between universities, industry, and government for the creation and exchange of knowledge to help promote innovation at the regional or national level (Etzkowitz, 2002 [8]; Leydesdorff & Etzkowitz, 1996 [9]). In this model of knowledge and innovation, each helix corresponds to its traditional function: the university provides creative researchers, the local industry turns research and creativity into products and innovation, and the local government contributes with legislation and financial support. This synergy can be described in Fig. 2.

In addition, one helix can play the role of another. The interaction and reciprocity between the 3 areas are key elements of the innovation process (Laguna & Duran-Romero, 2017 [10]).

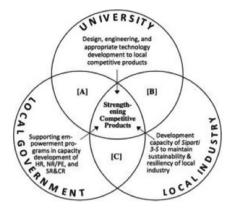


Fig. 2. Government-University-Industry Synergy in Triple Helix Communication Model

3 Methodology

The authors use qualitative research because authors feel this research seeks to understand a problem, as stated by Cresswell about qualitative methods from his book entitled Research Design: Qualitative, Quantitative, and Mixed Methods Approaches defines research guided by a qualitative paradigm. It is defined as: "The process of inquiry to understand social or human problems based on constructing a complex and holistic picture" (Cresswell, 2009 [11]).

Research guided by a qualitative paradigm is defined as: "A research process for understanding human or social problems by creating a comprehensive and complex picture." Cresswell continued that research using qualitative research methods is presented in words, detailed view reports obtained from information sources, and carried out in a natural setting.

From this explanation, it can be concluded that qualitative research is free from manipulating research variables. Researchers only function as observers and discoverers of facts in research.

In this study, a qualitative method is used with a descriptive model, namely research that provides a careful description of certain individuals or groups of conditions and symptoms that occur (Koentjaraningrat, 1994 [12]). To analyze internal and external factors that influence the development of the Sumbawa weaving industry through stakeholder analysis and SWOT analysis, then formulate a strategy for developing the Sumbawa weaving industry using Delphi analysis.

Data collection methods include focus group discussions, participatory resource mapping, observation, in-depth interviews, and literature studies.

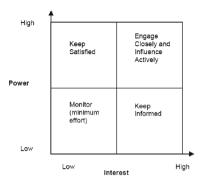


Fig. 3. Stakeholder Analysis

4 Results

The results of data collection will be analyzed using Stakeholder Analysis, SWOT Analysis (Strengths, Weaknesses, Opportunities, Threats), IFAS (Internal Factors Analysis Strategic), EFAS (External Factors Analysis Strategic), and Delphi Analysis.

4.1 Stakeholder Analysis

Stakeholder analysis in this study aims to find stakeholders who have influence and a high interest in the process of developing the Sumbawa Weaving Industry in Poto Village, Moyo Hilir, Sumbawa Regency. This stakeholder analysis can be described in Fig. 3.

The stakeholder analysis matrix in Fig. 3 shows that: (1) When the organization has high power with high interests, then the parties must be involved in planning and implementing strategy; (2) When the organization has high power with low interest, then the parties are involved in planning and implementing the strategy, but in a small portion; (3) When the organization has low power with high importance, then the parties need to be maintained by providing enough information because it will be very helpful in the strategy implementation process; and (4) When the organization has low power with low interest, then the parties are adequately monitored with reasonable communication.

4.2 SWOT Analysis

The purpose of formulating a general strategy or grand strategy is to develop the company by utilizing the results of a SWOT analysis in a format by selecting 3 to 15 main factors for each strength, weakness, opportunity, and threat. By linking one factor with other factors that are in one quadrant. This SWOT analysis can be described in Table 1, 2, and Fig. 4.

 Table 1. Internal Factors (Strengths and Weaknesses)

No.	Strengths			
1.	Commitment to support from the Regent of Sumbawa to develop Sumbawa Weaving			
2.	The weaving craftsmen of Poto Village have organized themselves by having the Sumbawa Traditional Weaving Association (APDISA).			
3.	Commitment to support from the Village Head to develop Sumbawa Weaving.			
4.	Commitment to support from community leaders and cultural leaders.			
5.	Weaving in Poto Village has become part of the culture.			
6.	Support from the private sector in making events.			
7.	Weaving can be used as a pawn at a pawnshop.			
8.	There is already a Sumbawa Regent SK No. 95 of 2022 concerning the Determination of the Sumbawa Regency Weaving Motif.			
9.	Poto Village Weaving Production consists of 2 methods: Gedogan and ATBM.			
No.	Weaknesses			
1.	Prices are considered expensive and have not been able to compete.			
2.	There is no regeneration; weaving craftsmen are dominated by elderly women.			
3.	It's still hard to adapt to change.			
4.	The Poto Village weaving products do not yet have brand rights.			
5.	The weaving SMI of Poto Village does not yet have business legality.			
6.	The level of education and knowledge about the craftsman's business and the mark is still weak.			
7.	Making traditional weaving is still a side job. Craftsmen only make weaving if there is an order.			
8.	Low business management.			
9.	Craftsman production is not sustainable.			
10.	There is no product diversification yet.			
11.	There has been no application of digital systems in production, marketing, and sales.			
12.	There tends to be a cultural grip on weaving motifs.			
13.	The spirit of entrepreneurship is still low. Craftsmen still depend on local government support.			

Table 2. External Factors (Opportunities and Threats)

No.	Opportunities
1.	The district government has required ASN to use ikat and songket weaving on certain days.
2.	The Provincial and Central Governments have great attention to the use of weaving and local products.
3.	OVOP Program from the Ministry of Industry of the Republic of Indonesia.
4.	Massive P3DN campaign and the necessity of local governments to buy local products through the procurement system.
5.	Facilitate local e-catalog.
6.	The growth and development of young fashion designers in the area.
7.	Attention and support for tourism development are quite high.
8.	MXGP International event held in Sumbawa Regency.
9.	International Moto GP event held in Central Lombok.
10.	A digital system that continues to develop facilitates the marketing and sales of MSE products.
No.	Threats
1.	Expansion of woven from outside has been established with a lower price offer.
2.	Prices of weaving raw materials continue to rise.
3.	Intellectual property protection for weaving in Sumbawa Regency has not been maximized.

4.3 IFAS and EFAS Analysis

IFAS and EFAS analysis is a technique to measure the weight, rating, and score of strength, weakness, opportunity, and threat factors. This IFAS and EFAS analysis can be described in Table 3 and Table 4.

4.4 Delphi Analysis

Delphi analysis is a method used to assist researchers in compiling an optimal decision tree while assessing the importance of each branch of alternative problem-solving. The whole stages of the research can be summarized in Fig. 5.

The research steps can be seen based on the Delphi analysis above through the data collection process. Then the data presentation is carried out, which was previously sorted first. Furthermore, an in-depth data analysis was conducted to draw a comprehensive conclusion.

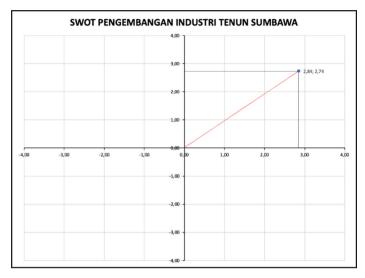


Fig. 4. SWOT of the Sumbawa Weaving Industry Development

 Table 3. Internal Factors Analysis Strategic (IFAS)

Strategic Fa	ctors	Weight	Rating	Score
Strengths	Commitment to support from the Regent of Sumbawa to develop Sumbawa Weaving.	0.05	5	0.26
	The weaving craftsmen of Poto Village have organized themselves by having the Sumbawa Traditional Weaving Association (APDISA).	0.05	5	0.26
	Commitment to support from the Village Head to develop Sumbawa Weaving.	0.05	5	0.26
	Commitment to support from community leaders and cultural leaders.	0.05	5	0.26
	Weaving in Poto Village has become part of the culture.	0.05	5	0.26
	Support from the private sector in making events.	0.05	5	0.26
	Weaving can be used as a pawn at a pawnshop.	0.03	4	0.14
	There is already a Sumbawa Regent SK No. 95 of 2022 concerning the Determination of the Sumbawa Regency Weaving Motif.	0.03	4	0.14
	Poto Village Weaving Production consists of 2 methods: Gedogan and ATBM.	0.03	3	0.10

(continued)

 Table 3. (continued)

Strategic Factors			Rating	Score
Weaknesses	Prices are considered expensive and have not been able to compete.	0.05	1	0.05
	There is no regeneration; weaving craftsmen are dominated by elderly women.	0.05	1	0.05
	It's still hard to adapt to change.	0.05	1	0.05
	The Poto Village weaving products do not yet have brand rights.	0.03	2	0.07
	The weaving SMI of Poto Village does not yet have business legality.	0.03	1	0.03
	The level of education and knowledge about the craftsman's business and the market is still weak.	0.03	1	0.03
	Making traditional weaving is still a side job. Craftsmen only make weaving if there is an order.	0.05	2,5	0.13
	Low business management.	0.04	2,5	0.11
	Craftsman production is not sustainable.	0.05	1	0.05
	There is no product diversification yet.	0.05	2	0.10
	There has been no application of digital systems in production, marketing, and sales.	0.04	2,5	0.11
	There tends to be a cultural grip on weaving motifs.	0.03	2	0.07
	The spirit of entrepreneurship is still low. Craftsmen still depend on local government support.	0.05	1	0.05
	Total	1		2.84

 Table 4. External Factors Analysis Strategic (EFAS)

Strategic Factors		Weight	Rating	Score
Opportunities	The district government has required ASN to use ikat and songket weaving on certain days.	0.10	5	0.48
	The Provincial and Central Governments have great attention to the use of weaving and local products.	0.10	3	0.29
	OVOP Program from the Ministry of Industry of the Republic of Indonesia.	0.06	3	0.19

(continued)

 Table 4. (continued)

Strategic Fa	actors	Weight	Rating	Score
	Massive P3DN campaign and the necessity of local governments to buy local products through the procurement system.	0.08	3	0.24
	Facilitate local e-catalog.	0.08	3	0.24
	The growth and development of young fashion designers in the area.	0.06	3	0.19
	Attention and support for tourism development are quite high.	0.06	3	0.19
	MXGP International event held in Sumbawa Regency.	0.06	3	0.19
	International Moto GP event held in Central Lombok.	0.06	3	0.19
	A digital system that continues to develop facilitates the marketing and sales of MSE products.	0.06	3	0.19
Threats	Expansion of woven from outside has been established with a lower price offer.	0.10	1	0.10
	Prices of weaving raw materials continue to rise.	0.10	1	0.10
	Intellectual property protection for weaving in Sumbawa Regency has not been maximized.	0.06	2	0.13
	Total	1		2.74

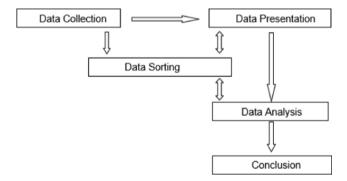


Fig. 5. Research Stages

5 Discussion and Conclusion

This study aims to analyze the development of Sumbawa weaving and design a strategy for developing Sumbawa weaving based on the OVOP approach with a triple helix

communication model. This is useful for optimizing the management of weaving so that it has competitiveness by using internal and external factors that affect the development of the Sumbawa weaving industry through stakeholder analysis and SWOT analysis. Furthermore, the thing to do is to formulate a strategy for developing the Sumbawa weaving industry using Delphi analysis.

The stakeholder analysis consists of 3 parties: the government, academics, and weaving craftsmen. Where the Regional Government has very strong power and has supported the development of the Sumbawa weaving industry, but the low interest of weaving craftsmen coupled with a lack of knowledge makes the production process Weaving is still using the traditional way. This makes the production process slow, and the weaving price is relatively higher than the market price. So there is a need for the role of academics to provide training and business guidance to weaving craftsmen in Sumbawa Regency. Therefore, the authors recommend maintaining the relationship between the three parties to establish a good synergy.

The SWOT analysis discusses the condition of Internal Factors Analysis Strategic (IFAS) and External Factors Analysis Strategic (EFAS). Then, those will be used as the basis for designing a development strategy to overcome existing weaknesses, face threats both currently being faced and will be faced, take advantage of opportunities that arise, and optimize the strengths that have been possessed in the face of competition.

The IFAS analysis obtained a higher total score of 2.84 than the EFAS analysis of 2.74. These results indicate that internal factors (strengths and weaknesses) have a stronger role than external factors (opportunities and threats). So that the Sumbawa weaving industry is expected to focus more on maximizing strength, especially on: commitment to support from the Regent of Sumbawa to develop Sumbawa Weaving; the weaving craftsmen of Poto Village have organized themselves by having the Sumbawa Traditional Weaving Association (APDISA); commitment to support from the Village Head to develop Sumbawa Weaving; commitment to support from community leaders and cultural leaders; weaving in Poto Village has become part of the culture, and support from the private sector in making events. As well as minimizing weaknesses, especially on: making traditional weaving is still a side job, craftsmen only make weaving if there is an order; low business management; and there has been no application of digital systems in production, marketing, and sales.

Currently, the Sumbawa weaving industry has a good opportunity to optimize its strengths by taking advantage of existing opportunities and overcoming internal weaknesses. It can anticipate threats currently or will be faced to have competitiveness during increasingly competitive competition.

Finally, implementing a development strategy using a differentiation strategy will be more appropriate for the Sumbawa weaving industry to produce products that can compete in the global market while still having the region's unique characteristics.

Acknowledgments. The authors would like to thank LPPM UPN "Veteran" Yogyakarta for the financial support of this experiment.

References

- 1. Rangkuti, F. Analisis SWOT: Teknik membedah kasus bisnis. Jakarta: Gramedia; 2013.
- 2. Siagian, S. Manajemen Sumber Daya Manusia. Jakarta: Bumi Aksara; 2012.
- 3. M. Triharini, D. Larasati, & R. Susanto. Pendekatan One Village One Product (OVOP) untuk mengembangkan potensi kerajinan daerah studi kasus: Kerajinan gerabah di Kecamatan Plered, Kabupaten Purwakarta. ITB J. Vis. Art Des. 2014; Vol. 6, No. 1, pp. 29-42.
- Etzkowitz, H. The entrepreneurial university wave: From ivory tower to global economic engine. Industry and Higher Education. 2014; Vol. 28, No. 4, pp. 223-232. https://doi.org/10. 5367/ihe.2014.0211
- Etzkowitz, H., & Viale, R. Polyvalent knowledge and the entrepreneurial university: A third academic revolution? Critical Sociology. 2010; Vol. 36, No. 4, pp. 595-609. https://doi.org/ 10.1177/0896920510365921
- Leydesdorff, L. The triple helix quadruple helix, an N-tuple helices: Explanatory models for analyzing the knowledge-based economy? Journal of Knowledge Economics. 2012; Vol. 3, pp. 25-35. https://doi.org/10.1007/s13132-011-0049-4
- Lombardi, P., Giordano, S., Farouh, H., & Yousef W. (2012). Modeling the smart city performance. Innovation: the European Journal of Social Science Research. 2012; Vol. 25, No. 2, pp. 137-149. https://doi.org/10.1080/13511610.2012.66
- 8. Etzkowitz, H. The triple helix of university-industry-government relations: Implications for policy and evaluation. 2022; In SE-114 28.
- 9. Leydesdorff, L., & Etzkowitz, H. Emergence of a triple-helix of university-industry-government relations. Science and Public Policy. 1996; Vol. 23, No. 5, pp. 279-286.
- Laguna, N. E., & Duran-Romero, G. Science parks approaches to address sustainability: A
 qualitative case study of the science parks in Spain. International Journal of Social Ecology
 and Sustainable Development (IJSESD). 2017; Vol. 8, No. 3, pp. 38-55. https://doi.org/10.
 4018/IJSESD.201707010
- 11. Cresswell, J. W. Research Design: Qualitative, Quantitative, and Mixed Methods Approaches, Thousang Oaks: Sage Publisher; 2009.
- 12. Koentjaraningrat. Metode-Metode Penelitian Masyarakat. Jakarta: Gramedia Pustaka Utama; 1994.

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (http://creativecommons.org/licenses/by-nc/4.0/), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

