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STRATEGIC ROLE IDENTIFICATION OF AGRO-SCIENCE TECHNOPARK MANAGEMENT IN GORONTALO PROVINCE Wawan K. Tolinggi Agribusiness Department Faculty of Agriculture Gorontalo State University Gorontalo Jendral Sudirman Street 6 Gorontalo wawan.tolinggi@ung.ac.id Abstract This study aims at determining strategic role groups related to the management of agro-science technopark site based on external conditions (opportunities and threats) and internal condition (strengths and weaknesses). Data were collected through observation and focus group discussion.

Data analysis in this study employs SWOT analysis and Analytic Hierarchy Process (AHP). SWOT analysis uses internal and competitiveness factors to reveal that the strategic position of the management is within the first quadrant (Strengths-Opportunities strategy) with the coordinate points of 0.76 and 2.52.

Paired comparative evaluation with AHP reveals that the global priority value from strategic role groups is: PS1 (0.419) local government's role, stakeholders, and institutional management; PS2 (0.239) research institutions' role, research and development; PS3 (0.210) community and business world's role; PS5 (0.136) regional condition and availability of raw materials' role; and PS4 (0.131) institutional role and marketing system.

Keywords : Agro-Science Technopark, SWOT Analysis, AHP Background Innovation is critical in economic growth and creation of competitiveness, thus, a helix concept, which is based on the idea that innovation is an interactive result that involves various actors that contribute based on their institutional function in the community is proposed (Praswati, 2017).

Taking the Triple Helix (TH) concept that involves "government", "university", and

"industry", which later grows into a quadruple helix with the addition of "social community" as one of the actors in the helix. The quintuple helix (QuiH), a further development, encompasses political system and natural environment as determinants in sustainable development and provide "manpower" and "natural capital" such as plants, animal variation, etc., (Carayannis and Campbell, 2012).

It is expected that in the future industry will keep emerging and cooperation between industry and university in the development of research and innovation will become a necessity (Audretsch et al., 2006). One of the innovation spaces within the helix concept is the science and technopark, which is able to commercialize knowledge and provide service to develop entrepreneurial potential and ensure competitive advantages of a region, including, Gorontalo province.

Thus, it becomes urgent to carry out a comprehensive study on the readiness of Gorontalo province in developing a science technopark as an area with economic development dimension as well as the center of knowledge and technology development that support the acceleration of innovation as well as a motor in the development of the region.

Based on its economic growth structure, a potential science technopark to be developed in Gorontalo province should be focused on the development of Agro-Science Technopark site. This is supported by the gross regional domestic product of Gorontalo in the third semester of 2018, which are still dominated by the contribution of agriculture, forestry, fisheries sectors by 39.92%, and highest economic growth rate is 2.46% (Gorontalo Province Central Bureau of Statistics, 2018).

To support this effort, several studies on the potential Agro-Science Technopark sites recommended location potential, potential commodity, and potential type of agro-industry that are appropriate to be developed in the Agro-Science Technopark site in Gorontalo province (Tolinggi et al., 2018). Further, a study to formulate the management of the Agro-Science Technopark site is carried out, which initiated by stakeholder analysis as a process to identify individuals, groups, and organizations that are influenced or can influence environment and future generations as well as prioritizing individuals and groups involved within the decision-making process (Reed et.al, 2009). The result of this study by Tolinggi et al.,

(2018) has managed to classify 20 stakeholders involved within the study into three

categories, which was based on the stakeholders' identification concept by Grimble (1998), which has been modified and used by Mulyaningrum (2013) in Nurfatriani, et al., (2015), those are : Primary Stakeholder, Key Stakeholder, and Secondary Stakeholder. In addition, the study has also managed to classify those twenty stakeholders into four groups based on the interest level and influence level criteria in the management of the plan to establish Agro-Science Technopark site in Gorontalo province (Figure 1), these groups are dominated by key players classification by 9 stakeholders (45%) from the total stakeholders involved, context setter classification by five stakeholders (25%), subject classification by four stakeholders (20%), and crowd classification by two stakeholders (1%). Figure 1.

Influence-Interest Matrix of Stakeholders in Management of Agro-Science Technopark Site Plan in Gorontalo Province (Tolinggi et al., 2018) Based on the result of stakeholders analysis in that study, it becomes necessary to determine the strategic position of those stakeholders in order to identify strategic role groups in relation to the management of Agro-Science Technopark site based on the external condition (opportunities and threats) and internal conditions (strengths and weaknesses).

Observation on the internal and external condition are analyzed using the SWOT (strengths, weaknesses, opportunities, and threats) matrix, and is based on the logic to maximize strengths and opportunities and minimize weaknesses and threats (Rangkuti, 2015) to obtain best strategic alternatives, which in its implementation, decision is made to prioritize the strategies with high priority score using the Analytical Hierarchy Process (AHP) method.

Theoretical Review Science Techno Park International Association of Science Park / IASP defines science technopark as an organization managed by professionals with the main objective of increasing the economic growth and strengthen the role of science and technology in economic development by promoting innovation culture and competitiveness of the related business, and knowledge-based institutions (Ministry of Technology Research and Higher Education, 2015).

Hierarchically, development of Science and Technology Park is directly under the president's control, where the development of National Science and Techno Park, then becomes the umbrella for development of science park in provincial level and a number of technopark in regencies/municipalities level. Science technopark aims at stimulating and managing the knowledge and technology flow in university, research and

development institutions and industry in its area; facilitate establishment and development of innovation-based companies through business incubation and spinoff process, and provide services to increase other value-added, through the provision of space and high quality supporting facilities.

Based on the outline of the science technopark development model, there are three units in its development process namely: business incubation, technology development unit, and technical service unit; where for each process unit supporting facilities and services are provided for users, and different outputs for each process units (Ministry of National Development Planning: National Development Planning Agency, 2015).

The success in development of science park or technopark, from Stanford research park that becomes the incubator for the growth of Silicon Valley, Science Park in Japan which is able to contribute to the added value for technology-based industries (Fukugawa, 2006), Techno Park in Malaysia, which focused on collaborative research and development in automotive, biotechnology, and electronics (Rasiah and Govindaraju, 2009), up to Korea who has succeeded in mapping the innovation cluster based on the established science park (Deog-Seong and Yoem, 2012).

On the other hand, the establishment of Science Park and Techno Park are signified by the establishment of Bandung High Tech Valley (BHTV) in 2006, established by Institut Teknologi Bandung (ITB), which focused on startup business in the technology field. Later, Solo Techno Park is established, where its development zone consists of IT and research zone, training, a business incubator, industry and trade, and several other science parks and technoparks that are being pioneered in the regions, both at provincial and regencies/municipalities level.

SWOT Analysis A SWOT analysis is the systematic identification of various factors to formulate the company's strategy. This analysis is based on logic to maximize strengths and opportunities while at the same time try to minimize weaknesses and threats. The strategic decision-making process is always related to attainment of vision, mission, objectives, strategy and company's policy.

Therefore, strategic planners should analyze current strategic factors of the company (strengths, weaknesses, opportunities, and threats) (Rangkuti, 2009). Meanwhile, SWOT analysis according to Kotler (2009) is overall evaluation toward strengths, weaknesses, opportunities, and threats. A SWOT analysis is one of the popular instruments to analyze

the internal and external environments of the company.

This analysis is based on the assumption that effective strategy will minimize weaknesses and threats. When it is accurately implemented, this simple assumption will have large impact on the success of the designed strategy. SWOT analysis serves to collect information from situational analysis and separate into internal problems (strengths and weaknesses) and main external problems (opportunities and threats).

A SWOT analysis will describe whether the information will be helpful to assist the company in achieving its objectives or indicates that there is an obstacle that should be faced or mitigated to obtain the desired result (Ferrel and Harline, 2005). Analytic Hierarchy Process (AHP) The multi-criteria decision-making process, Analytic Hierarchy Process (AHP), is a method that has been known and accepted to provide answer toward various decision-making and provides alternatives (Kazibudzki, 2013). This AHP method is developed by Thomas L.

Saaty, a mathematician, as a framework to make an effective decision on complex problems by simplifying and accelerating the decision making the process of this problem through the various arrangements of variables in a hierarchical model. It provides numeric value in subjective development on the importance of each division of the variables group and synthesized various considerations to determine how dependent variable, and which dependent variables which have highest priority score and take action to influence the result in this situation (Saaty, 2008).

Methodology Data in this study consist of primary and secondary data. Primary data are collected through observation and interview with selected respondents using purposive sampling method in Focus Group Discussion. Meanwhile, secondary data are collected from the literature review and desk study related to management of Agro-Science Technopark site.

The data analysis tool is SWOT-AHP (Strength Weakness Opportunities Threats – Analytical Hierarchy Process) with the following stages: (1) conducting SWOT analysis to define internal and external factors, both qualitatively and quantitatively which produces the SWOT matrix on Strategic Position Mapping of the Agro-Science Technopark Site management and the quadrant position to determine type of strategies that will be used in the management of the Agro-Science Technopark site in Gorontalo province; (2) describing the hierarchically structure of the strategy and the strategic role of SWOT-

AHP analysis; (3) developing paired comparison method of each hierarchy, using Saaty scoring scale; and (4) determining the global strategic position of the stakeholders, their ranks and priorities.

The Results Of Statistical Test Management of the Agro-Science Technopark site in Gorontalo province based on SWOT-AHP analysis refers to the stages developed by Kangas et al., (2001). SWOT Analysis A SWOT analysis is started by defining its objective that is to develop a strategy in the management of Agro-Science Technopark site in Gorontalo province.

Based on this objective, identification of internal and external factors which suitable to the management principles of Agro-Science Technopark site, through observation and interview with key respondents. Those internal and external factors then classified into six aspects (Table 1), namely: (1) natural resource and geographic environment aspect; (2) human resource aspect; (3) business activities and socio-economic aspect; (4) science and technology and innovation aspect; (5) government and stakeholders support; and (6) institutional aspect. Table 1. Internal and External Factors of the Management of Agro-Science Technopark Site. INTERNAL AND EXTERNAL FACTORS _S _W _O _T _ _A.

NATURAL RESOURCE AND GEOGRAPHIC ENVIRONMENT ASPECT _ _1 _The location of Agro-Science Technopark site: Strategic _v _ _ _ _ _2 _Road infrastructure and transportation facilities: Sufficient _v _ _ _ _ _3 _Availability of area and prominent raw materials: Sufficient _v _ _ _ _ _4 _Marketing area and network: sufficiently broad _ _ _v _ _ _5 _Access toward resources and raw materials: sufficiently broad _v _ _ _ _ _B.

ASPEK SUMBER DAYA MANUSIA _ _1 _Community's level of education and skill in utilizing commodity-based technology: low _ _v _ _ _ _2 _Level of income and welfare of the community surrounding the Agro-Science Technopark area: Low _ _v _ _ _ _3 _Managerial and professional ability of the workers: available _v _ _ _ _ _4 _Community and business world's motivation in agribusiness: Available _v _ _ _ _ _C.

BUSINESS AND SOCIO-ECONOMIC ASPECT _ _1 _Working capital: limited _ _v _ _ _ _2 _Prominent commodity-based business: Traditional _ _v _ _ _ _3 _Marketing institution and channel: yet optimized _ _v _ _ _ _4 _Regional economic endowment for regional development: Uneven _ _ _ _v _ _5 _Market demand for the processed product: high _ _ _v _ _ _6 _Production continuity: Low _ _v _ _ _ _7 _Market growth and global competition: High _ _ _ _v _ _D.

SCIENCE AND TECHNOLOGY AND INNOVATION ASPECT _ _1 _A skill training system that encourages the community to establish new business: less available _ _v _ _ _ _2 _Products' processing based on prominent commodities: less innovative and less variative _ _v _ _ _ _3 _Diversification potentials for the prominent commodities products: plentiful _ _ _v _ _ _4 _IT development for online marketing: opportunities are open _ _ _v _ _ _E.

GOVERNMENT AND STAKEHOLDERS SUPPORT ASPECT _ _1 _Regulation and policy support from the government: available _v _ _ _ _ _2 _Local government readiness in the implementation of programs related to Agro-Science Technopark site: in place _v _ _ _ _ _3 _Support from stakeholders for integrative and sustainable management of the Agro-Science Technopark site: available _ _ _v _ _ _F.

INSTITUTIONAL ASPECT _ _1 _Financial institutions (cooperatives and banks): available _ _ _v _ _ _2 _Support from research development and institution in conducting market research or product innovation: available _ _ _v _ _ _3 _Support from educational and training institutions to increase entrepreneurship skills: available _ _ _v _ _ _4 _Structure and institutional working mechanism in site management: in place _v _ _ _ _ _Notes: S = Strengths, W = Weaknesses, O = Opportunities, T = Threats Based on the identifications of SWOT factors above, a SWOT matrix is developed using two approaches, quantitative and qualitative approaches.

A qualitative approach is made to identify alternative strategy as the result of strategy formulation based on the conversion of internal and external factors, whereas, quantitative approach is made to map the position of Agro-Science Technopark site management based on the analysis of each strategic factors' characteristics. Qualitative Approach In the SWOT matrix, there are eight boxes.

Two most top boxes are for the external environment which consists of opportunities and threats in the management of Agro-Science Technopark site, whereas two boxes in the left are internal factors, strengths, and weaknesses in the management of Agro-Science Technopark site. Meanwhile, the other four boxes are strategic issues from internal and external factors on Agro-Science Technopark site management in Gorontalo province, which consists of SO strategies (strengths-opportunities); strategies to optimize strengths by utilizing opportunities and WO Strategies (weaknesses-opportunities); strategies to minimize weaknesses by utilizing opportunities; ST

strategies (strengths-threats) to minimize threats by utilizing opportunities, and WT (weaknesses-threats) that is strategy to minimize weakness and avoiding threats. Table 2.

SWOT Matrix for Formulation of Strategy to Manage Agro-Science Technopark Site _EXTERNAL FACTORS _ _ _Strengths _Weakness _ _INTERNAL FACTOR _S1 S2 S3 S4 S5 S6 S7 S8 S9 _Agro-Science Technopark Site: Strategic Road infrastructure and transportation facilities: Sufficient Availability of area and prominent raw materials: Sufficient Marketing area and network: sufficiently broad Managerial and professional ability of the workers: available Community and business world's motivation in agribusiness: Available Regulation and policy support from the government: available Local government readiness in the implementation of programs related to Agro-Science Technopark site: in place Structure and institutional working mechanism in site management: in place _W1 W2 W3 W4 W5 W6 W7 W8 _Community's level of education and skill in utilizing commodity-based technology: low Level of income and welfare of the community surrounding the Agro-Science Technopark area: Low Working capital: limited Prominent commodity-based business: Traditional Marketing institution and channel: yet optimized Production continuity: Low A skill training system that encourages the community to establish new business: less available Products' processing based on prominent commodities: less innovative and less variative _ _Opportunities _SO Strategies _WO Strategies _ _O1 O2 O3 O4 O5 O6 O7 O8 _Marketing area and network: sufficiently broad Market demand for the processed product: high Diversification potentials for the prominent commodities products: plentiful IT development for online marketing: opportunities are open Support from stakeholders for integrative and sustainable management of the Agro-Science Technopark site: available Support from research development and institution in conducting market research or product innovation: available Support from educational and training institutions to increase entrepreneurship skills: available Financial institutions (cooperatives and banks): available _SO1 SO2 SO3 SO4 SO5 _Utilizes support from educational and training institutions and research and development agencies to increase community and business world motivation in agribusiness (S6, O6, O7) Utilizes the availability of land and important raw materials to fulfill the market demand and increase diversification of products made from a prominent commodity (S3, O2, O3) Increase stakeholders' support in the management of Agro-Science Technopark site and the readiness of local government in the implementation of programs related to the site management to strengthen the structure, and institutional mechanism of the site management, and managerial ability and workers' professionalism (O5, S5, S8, S10)

Utilizes strategic location, road infrastructure, and sufficient transportation, and access toward resources or raw materials to broaden and increase marketing network and area (S1, S2, S4, O1) Utilizes regulation and institutional support from the local government, financial institution, and IT development potential to broaden online marketing (S7, S9, O4, O8) _WO1 WO2 WO3 WO4 WO5 _Optimizes marketing channel and institutions by utilizing openly wide marketing network to meet the market demand, which supported by opportunities for IT development for online marketing system (W5, O1, O2, O4) Utilizes support from research and development institutions to increase the community's education and skill in the utilization of resources and prominent commodity-based technology (O6, W1) Utilizes support from education and training institutions to obtain skill training that supports the community in the establishment of new modern businesses (O7, W4, W7) Utilizes the availability of financial institutions in overcoming the problem related to limited agribusiness working capital to increase income and welfare (O8, W2, W3) Increase stakeholder support in the utilization of diversification potentials for prominent commodity products to increase a more innovative and varied product (O3, O5, W8) _ _Threats _ST strategies _ WT Strategies _ _T1 T2 _Regional economic endowment for regional development: Uneven Market growth and global competition: High _ST1 ST2 ST3 _Utilizes strategic location, road infrastructure and available transportation, availability, and access toward raw materials of the prominent commodity to solve uneven economic endowment of the region (S1, S2, S3, S4, T1) Increase local government readiness in the implementation of programs related to Agro-Science Technopark site management which supported by the availability of regulation and policy to solve high market growth and demanding global competition (S7, S8, T2) Increases community motivation and business world in agribusiness, and strengthening the structure and institutional mechanism of the site management which supported by the managerial ability and workers' professionalism to solve market growth and global competition issues (S5, S6, S9, T1) _WT1 WT2 WT3 _Increase the level of education and skill of the community in utilizing commodity-based resources and technology and ability in processing the products and production continuity to solve the high market growth and demanding global competition (W1, W8, W6, T2) Optimizes marketing channel and institutions to solve the limited working capital issue as an effort to increase regional economic endowment in site development (W3, W5, T1) Optimizes skill training system which encourages the community to establish a new business, with more modern commodity-based business to increase community's income and welfare as the answer for rapid market growth and high global competition issues (W7, W2, W4, T2) _ _ Formulation of various alternative strategies in Table 2 produces 16 alternatives, where SO strategies and WO strategies produce every

five alternatives, every three alternatives are produced by ST strategies and WT strategies.

Quantitative Approach Data on analysis of internal and external factor are quantitatively changed through calculation which preceded by scoring and rating for each factor by expert respondents, which in this study are stakeholders identified through stakeholder analysis method which classified into four groups: Key Player, Context Setters, Subjects, and Crowd (Tolinggi et al., 2018).

Data collection for scoring are taken through focus group discussion method (FGD) using closed-ended questions with answer scale and intensity from highest to lowest (Likert scale), in which, the score recapitulation of all respondents are given in each question. The result of this value, rating, and score for each SWOT factor is presented in Table 3 and 4. Table 3.

Value, Rating, and Score for Internal SWOT Factors in the Management of Agro-Science Technopark Site in Gorontalo province INTERNAL FACTORS _VALUE _RATING _SCOR _ _1 _Agro-Science Technopark Site : Strategic _0.06 _3.25 _0.19 _ _2 _Road infrastructure and transportation facilities: Sufficient _0.06 _3 _0.18 _ _3 _Availability of area and prominent raw materials: Sufficient _0.05 _4 _0.20 _ _4 _Marketing area and network: sufficiently broad _0.07 _2.75 _0.18 _ _5 _Managerial and professional ability of the workers: available _0.05 _3 _0.16 _ _6 _Community and business world's motivation in agribusiness: Available _0.06 _3.75 _0.23 _ _7 _Regulation and policy support from the government: available _0.06 _3.25 _0.20 _ _8 _Local government readiness in implementation of programs related to Agro-Science Technopark site: in place _0.07 _3.75 _0.24 _ _9 _Structure and institutional working mechanism in site management: in place _0.05 _3 _0.15 _ _Total Strength Factors _0.52 _ _1.58 _ _1 _Community's level of education and skill in utilizing commodity-based technology: low _0.07 _1.75 _0.11 _ _2 _Level of income and welfare of the community surrounding the Agro-Science Technopark area: Low _0.05 _2 _0.11 _ _3 _Working capital: limited _0.05 _1.75 _0.09 _ _4 _Prominent commodity-based business: Traditional _0.06 _1.75 _0.11 _ _5 _Marketing institution and channel: yet optimized _0.06 _2 _0.12 _ _6 _Production continuity: Low _0.06 _1.5 _0.09 _ _7 _A skill training system that encourages the community to establish new business: less available _0.07 _1.5

_0.10 _ _8 _Products' processing based on prominent commodities: less innovative and less variative _0.06 _1.5 _0.09 _ _Total Weakness Factor _0.48 _ _0.82 _ _TOTAL INTERNAL

FACTOR _1.00 _ _2.39 _ _NOTE: Rating Value 4 = Major Strength, 3 = Minor Strength, 2 = Minor Weakness, 1 = Major Weakness Table 4. Value, Rating, and Score of External Factors for SWOT of Agro-Science Technopark Site Management in Gorontalo Province EXTERNAL FACTORS _ VALUE _RATING _SCORE _ _1 _Marketing area and network: sufficiently broad _0.12 _4 _0.48 _ _2 _Market demand for the processed product: high _0.11 _3.75 _0.42 _ _3 _Diversification potentials for the prominent commodities products: plentiful _0.12 _3 _0.36 _ _4 _IT development for online marketing: opportunities are open _0.10 _3.5 _0.37 _ _5 _Support from stakeholders for integrative and sustainable management of the Agro-Science Technopark site: available _0.12 _4 _0.48 _ _6 _Support from research development and institution in conducting market research or product innovation: available _0.10 _3.75 _0.39 _ _7 _Support from educational and training institutions to increase entrepreneurship skills: available _0.11 _4 _0.45 _ _8 _Financial institutions (cooperatives and banks): available _0.06 _3.25 _0.19 _ _Total Opportunity Factors _0.79 _ _2.94 _ _1 _Regional economic endowment for regional development: Uneven _0.10 _2 _0.21 _ _2 _Market growth and global competition: High _0.10 _2 _0.21 _ _Total Weakness Factors _0.21 _ _0.42 _ _TOTAL EXTERNAL FACTORS _1.00 _ _3.36 _ _NOTE: Rating Value 4 = Major Strength, 3 = Minor Strength, 2 = Minor Weakness, 1 = Major Weakness Following obtainment of this result of value, rating, and score of internal and external factors of SWOT (Table 3 and 4), then calculation of Strength Posture and Competitive Posture to determine the coordinates from the quadrant, which showed the strategic position of Management of the Agro-Science Technopark site in Gorontalo province with the following formula: Strength Posture = Strengths + (- Weaknesses) = 1.58 + (- 0.82) = 0.76 Competitive Posture = Opportunities + (- Threats) = 2.94 + (- 0.42) = 2.52 Figure 2.

SWOT Matrix Strategic Position Mapping of Agro-Science Technopark Site Management The coordinate points (0.76, 2.52) in Figure 2 shows that the strategic position of Agro-Science Technopark site management is within Quadrant I (SO Strategy), that is a strategy to optimize strengths to utilize opportunities. The strategies to be optimized to utilize opportunities are: SO1.

Utilizes support from educational and training institutions and research and development agencies to increase community and business world motivation in agribusiness (S6, O6, and O7) SO2. Utilizes the availability of land and important raw materials to fulfill the market demand and increase diversification of products made from a prominent commodity (S3, O2, O3) SO3.

Increase stakeholders' support in the management of Agro-Science Technopark site and the readiness of local government in the implementation of programs related to the site management to strengthen the structure, and institutional mechanism of the site management, and managerial ability and workers' professionalism (O5, S5, S8, and S10) SO4.

Utilizes strategic location, road infrastructure, and sufficient transportation, and access toward resources or raw materials to broaden and increase marketing network and area (S1, S2, S4, O1) SO5. Utilizes regulation and institutional support from the local government, financial institution, and IT development potential to broaden online marketing (S7, S9, O4, O8) Description of Strategic Hierarchy Structure and Strategic Role of SWOT-AHP Analysis Based on a number of alternatives provided by the SO strategies, it becomes important to determine priority strategy and strategic roles which can be selected to clarify direction in the implementation of the decision-making process.

The strategic roles agreed by key respondents in this study are presented in Table 5. Table 5. Strategic Role of Agro-Science Technopark Site Management in Gorontalo Province Code _Role _Notes _ _PS1 _Role of local government, related stakeholder, and management institutions _Optimizes the role of local government and support from related stakeholder to increase managerial capacity and structural strengthening and institutional working mechanism of the site management to support the establishment of the competitive site _ _PS2 _Role of Educational, Research and Development Institutions _Optimizes the role of education, research, and development institution for diversification of a more innovative and variative processed products from prominent commodity _ _PS3 _Role of community and business world _Optimizes capacity (knowledge and skill) of the community and agribusiness actor through prominent commodity-based agribusiness to increase their income and welfare _ _PS4 _Role of marketing institution and system _Optimizes the channel, institution, and marketing system to broaden the network and marketing access to innovative products produced within the site.

_ _PS5 _Role of area condition and availability of raw materials _Optimizes the area condition with strategic location, road infrastructure and sufficient transportation, and availability of access and raw material for the uneven economic endowment of the region _ _Notes: PS= Strategic Role All five alternatives within SO strategies then mapped into five strategic roles to obtain priority strategy through the Analytical

Hierarchy Process (AHP) technique as seen in Figure 3. Figure 3.

Hierarchy Structure of SWOT-AHP for Strategic Management of Agro-Science Technopark Site Hierarchy structure of SWOT-AHP for Strategic Management of Agro-Science Technopark site which has been mapped in Figure 3 showed that the highest hierarchy is the objective or focus of the problem, the second hierarchy is the group of SWOT strategies which consists of four groups, namely: So strategies, WO strategies, ST strategies, and WT strategies.

The third hierarchy discuses a number of strategies from each group of strategies, and the lowest hierarchy is the role of strategies to the selected SO strategies as priority strategy based on value, rating, and score calculation of internal and external factors which later produced coordinate points within the first quadrant (SO Strategy).

Paired comparison matrix in each level of the hierarchy This paired comparison matrix is developed based on perception or opinion of the respondents by comparing several options or criteria. The markers are expert respondents who are also stakeholders identified through stakeholder analysis and classified into four groups: key player, context setters, subjects, and crowds (Tolinggi et al., 2018).

Data collection for this paired comparison matrix in each hierarchy which included into the AHP scheme (Figure 3), were taken using the Focus Group Discussion Method (FGD). The value used to measure the importance of two compared criteria is Saaty scale from 1 to 9, and reflects the expression of assessment of an expert in two criteria level of interest (Table 6). Table 6.

Saaty Assessment Scale Nilai _Paired Comparison _ _1 _Both criteria are equally important _ _3 _The first criterion is more important than the other _ _5 _First criteria are most important than the other _ _7 _First criteria are clearly more important from the other _ _9 _First criteria are definitely more important than the other _ _2,4,6,8 _A value between the two if there are doubts _ _ Below is the result of assessment for paired comparison matrix between strategies in SO strategies group (Table 7). Table 7. Paired comparison matrix between strategies in SO strategies group _SO1 _ SO2 _SO3 _SO4 _SO5 _ _SO1 _1 _3 _5 _7 _7 _ _SO2 _0.33 _1 _3 _5 _5 _ _SO3 _0.20 _0.33 _1 _1 _1 _ _SO4 _0.14 _0.20 _0.33 _1 _7 _ _SO5 _0.14 _0.20 _0.20 _0.33 _1 _ _Total _1.82 _4.73 _9.53 _14.33 _21.00 _ _ Evaluation of paired comparison matrix is manually calculated using the Ms. Excel application, by adding the value of each column.

This value is to divide the value of each compared strategy within the SO group hence the eigenvector as the value of priority value in that group is obtained (Table 8). Table 8. Paired comparison matrix evaluation between strategy in SO strategy group _SO1 _SO2 _SO3 _SO4 _SO5 _Priority _ _SO1 _0.55 _0.63 _0.52 _0.49 _0.33 _0.506 _ _SO2 _0.18 _0.21 _0.31 _0.35 _0.24 _0.259 _ _SO3 _0.11 _0.07 _0.10 _0.07 _0.05 _0.081 _ _SO4 _0.08 _0.04 _0.03 _0.07 _0.33 _0.112 _ _SO5 _0.08 _0.04 _0.02 _0.02 _0.05 _0.043 _ _Total _1.00 _1.00 _1.00 _1.00 _1.00 _1.00 _ _ The result of assessment toward decision-making has been checked its value of consistency ratio, where if the value of CR < 10% (CR < 0.1) then the assessment is considered consistent.

The value of CR for consistency between strategy assessments within the SO strategy is obtained through the following steps: Weighted sum vector for each obtained eigenvector value is calculated {1,3,5,7,7} * 0.51 + {0.33,1,3, 5,5} * 0.26 + {0.20,0,33,1,1,1} * 0.08 + {0.14,0.20,0.33,1,1} * 0.11 + {0.14,0.20,0.20,0.33,1} * 0.04 = {2.77,1.44, 0.42,0.56,0.22} Consistency Vector and Lambda Values ((2.77/0.51) + (1.44/0.26) + (0.42/0.08) + (0.56/0.11) + (0.22/0.04)) / 5 = 5.29 Consistency Index (CI) CI = (Lambda – n) / (n – 1) = (5.29 – 5) / (5 – 1) = 0.07 Consistency Ratio (CR) CR = CI / RI = 0.07 / 1.12 = 0.07 The RI value list based on matrix: 2 _3 _4 _5 _6 _7 _8 _9 _10 _And so on _ _0 _0.58 _0.9 _1.12 _1.24 _1.32 _1.41 _1.45 _1.49 _ _ _ The value of CR for consistency assessment between strategies within the SO strategy group is 0.07 which means that the assessment is consistent.

Hence, it can be further used to calculate a paired comparison matrix and consistency test for each strategic role (PS). Determine the Strategic Priority The summary of the evaluation result of the paired comparison is the final global priority of Strategic Role group and their ranks and priority order as presented in Table 9 below. Table 9.

Evaluation between strategies matrix within the SO strategy and Strategic Role Local SO priority _SO1 _SO2 _SO3 _SO4 _SO5 _Global PS Priority _PS Priority _ _ _0.506 _0.259 _0.081 _0.112 _0.043 _ _ _ _SO Rank _1 _2 _4 _3 _5 _ _ _ _PS1 _0.548 _0.233 _0.375 _0.301 _0.406 _0.419 _1 _ _PS2 _0.198 _0.233 _0.400 _0.351 _0.175 _0.239 _2 _ _PS3 _0.173 _0.300 _0.106 _0.253 _0.192 _0.210 _3 _ _PS4 _0.081 _0.233 _0.119 _0.095 _0.227 _0.131 _5 _ _PS5 _0.122 _0.178 _0.159 _0.119 _0.052 _0.136 _4 _ _ Discussion Based on the result of strategy evaluation, it is obtained that the highest local priority from SO strategy group in order are: SO1 (0.506) that is utilizing the support from education and training institution, and research and development institution to increase community and

business owners motivation in agribusiness. SO2 (0.259) utilizes the availability of land and important raw materials to fulfill the market demand and increase diversification of products made from the prominent commodity.

SO4 (0.112) utilizes strategic location, road infrastructure, and sufficient transportation, and access toward resources or raw materials to broaden and increase marketing network and area. SO3 (0.081) increases stakeholders' support in the management of Agro-Science Technopark site and the readiness of local government in the implementation of programs related to the site management to strengthen the structure, and institutional mechanism of the site management, and managerial ability and workers' professionalism.

SO5 (0.043) utilizes regulation and institutional support from the local government, financial institution, and IT development potential to broaden online marketing. Meanwhile, global priority with the highest score from the Strategic Role group in order are: PS1 (0.419) role of local government, related stakeholder, and management institutions; PS2 (0.239) role of Educational, Research and Development Institutions; PS3 (0.210) Role of community and business world; PS5 (0.136) role of area condition and availability of raw materials; and PS4 (0.131) role of marketing system and institution Ending Based on this research, it can be concluded that: The strategic position of Agro-Science Technopark site in Gorontalo province is within the first quadrant (SO Strategy) with the coordinates of 0.76 and 2.52.

Global priority with the highest value from the strategic role group respectively are: PS1 (0.419) local government role, related stakeholders, and institutional management; PS2 (0.239) the role of educational institution, research and development; PS3 (0.210) the role of community and business world; PS5 (0.136) the role of regional condition and availability of raw material; and PS4 (0.131) the role of institution and marketing system.

The implication of this study for the management of Agro-Science Technopark site is: The readiness of local government such as infrastructure support, regulation, and programs related to the site management The increase of support from research and development institution in developing research and technology transfer activities that have the potential to adopt, adapt and increase the competitiveness of the site The support from the business world in increasing the entrepreneurship capacity of the site community The increase in the motivation of within the site community to do featured commodity processing.

This study has some of its limitations, therefore, several things are recommended for future research, such as a more comprehensive study on the form and pattern of activities of each stakeholders, as an implementation of each strategic role that have been identified in this study, as well as linkage to the recommendation on local potential, commodity, and types of agro-industry, as recommended in previous study, which is also an integrated part of this study.

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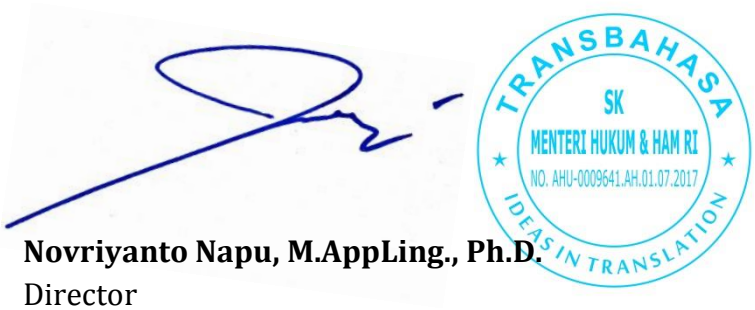

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