REGIONAL COMPETITIVENESS: THE AGGLOMERATION OF MULTIDIMENSIONAL MODEL IN THE SLEMAN REGENCY OF YOGYAKARTA SPECIAL REGION

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ABSTRACT

This study aim to the building of agglomeration economy in enhancing regional competitiveness by synergize of multidimensional aspect i.e. infrastructure, culture, local endogenous product, technology, regulation, regional set plan, economy and tourism aspect. Research design is mixed method: exploratory and qualitative research by using factor and content analysis. The subject of the research is Sleman Regency of Yogyakarta Special Region, Indonesia. The result of this research can indicate the cluster zoning that proper with the thematic cluster namely agribusiness horticulture and livestock cluster based ecotourism. When the horticultural and livestock agribusiness cluster based on ecotourism and to collaborate with strategic spatial, it will be gotten the optimum regional development in enhancing regional competitiveness.

Keywords: Industrial Cluster, Spatial and Regional Competitiveness

1. INTRODUCTION

The Phenomenon of regional development in Indonesia tends to adopt the Porter's Cluster Model related in the Regional Innovation System (RIS) drive by the joint regulation between The Ministry of research and technology No. 3 and The Ministry of Home Affairs No. 36 at the Year 2012. In this case, the regional innovation system is consist of government policy, industry cluster, innovation networking, technology diffusion, and the thematically development. Based on the sequential process of developing the regional inovation model, can be conclouded that the model must be fulfillment of the some of requirement there are skillful to form the cluster model in the proper situational and related in social culture, especially the characteristic of the region of Indonesia related in agribusiness and tourism. Therefore, we must identified the industry spatial and open space for green public area i.e. market, city garden, and institutional placement, the association of small business enterprise.

According to Harmono (2016) The newly of paradigm shift in regional development model is the cohesiveness between the clusters and growth pole model, towards a new economic development model. If the economic development just only based on the infrastructure condition, demand and supply mechanism

throughout macro economy indicators, it is a Traditional approaches to economic development, it will produce the capitalism and economic gap between capitalist and poor society, in the global economic condition they are not working. We must reshape the approach to economic development in the Indonesia based on a deeper understanding of the drivers of competitiveness in the modern global economy. And then it is need identified some factor and comparing in construct a new driver in proper economic strategy are focus on local wisdom potentially, social culture, natural resources and defuses of technology, and then must be connected in global economy competitiveness driver. The framework of the cohesiveness model between the industry cluster and growth pole can be shown for following figure 1.
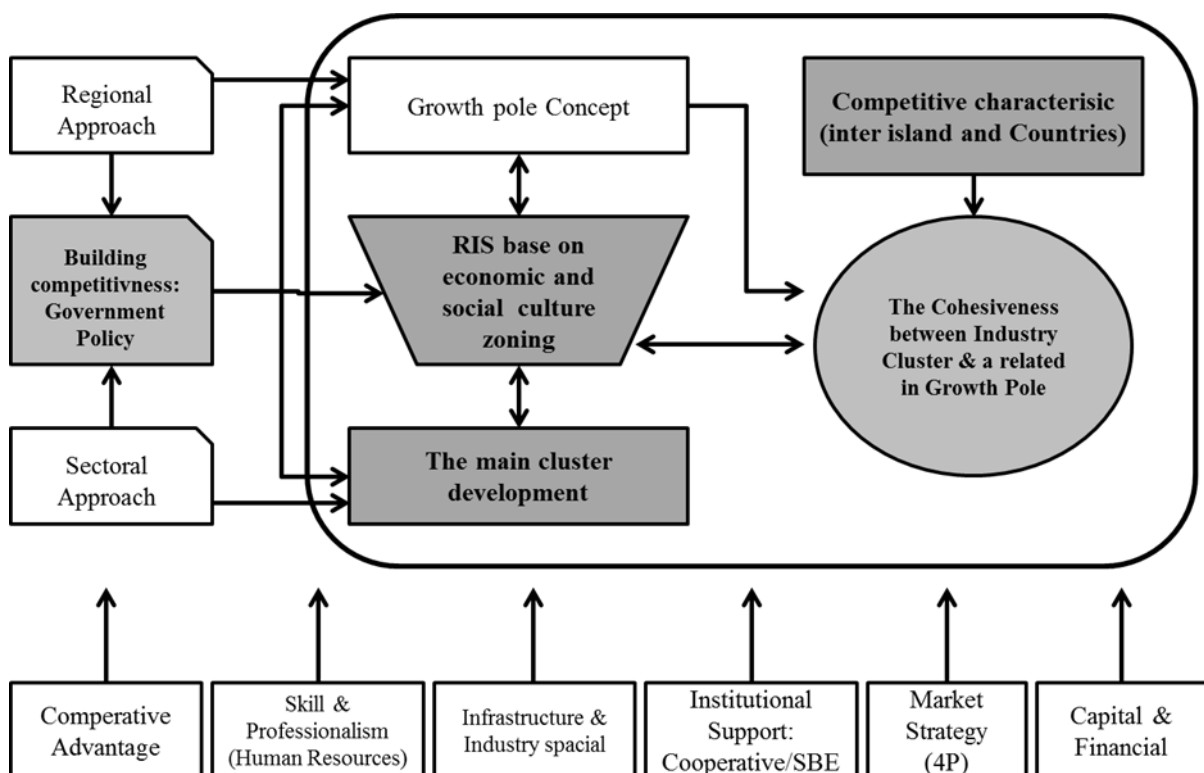

Figure 1: The frame of cohesivness between industry cluster and growth pole model, developed by Harmono (2016).

Growth Pole Theory

According to Perroux (1950, 1955) about the theory of growth and spatial theory of economics can be used as a strategy to increase regional competitiveness. The theory of growth that has been widely implemented in various countries can provide good inspiration for the development of regional innovation systems in Indonesia. Collaborating between industrial clusters with growth cover can be the direction of regional development policy in order to optimize all multidimensional resources. Its relationship with the Regional Innovation System (SIDa) when downstreaming industrial clusters supported by an innovative regional framework using the growth framework, will be achieved by a synergistic and sustainable development framework that ultimately achieves regional competitiveness.

2. RESEARCH METHODS

The research design of this research is the descriptive exploratory by using factor analysis and the descriptive qualitative and quantitative based on primary and secondary data.

Factor Analysis

Optional Statistics (Dziubin and Shirkey, 1974) (factor analysis algorithms)

A formulation of the industry cluster, using a factor analysis algorithms, optional statistics. The anti-image covariance matrix $\mathbf{A}=(a_{ij})$ is given by

$$a_{ij} = \frac{r^{ij}}{r^{ii}\, r^{jj}}$$

The chi-square value for Bartlett's test of sphericity is

$\chi 2 = -(W - 1 - \frac{rp+5}{6}) \log |\mathbf{R}|$ with p(p−1)/2 degrees of freedom.

The Kaiser-Mayer-Olkin measure of sample adequacy is Type equation here

$$KMOj = \frac{\sum_{i \neq j} r^2\, ij}{\sum_{i \neq j} r^2 ij + \sum_{i \neq j} a^2\, ij\, *} \quad KMO = \frac{\sum_{i \neq j} \sum r^2 ij}{\sum_{i \neq j} \sum r^2\, ij\; + \sum_{i \neq j} \sum a^2\, ij\;\; *}$$

In this case a*ij is the anti-image correlation coefficient.

And then follow Harman, (1976) Orthogonal Rotations factor analysis algorithms

Factor analysis algorithms orthogonal Rotations are done cyclically on pairs of factors until the maximum number of iterations is reached or the convergence criterion is met. The algorithm is the same for all orthogonal rotations, differing only in computations of the tangent values of the rotation angles.

The factor pattern matrix is normalized by the square root of communalities:

$\Lambda^{*}_{m} = \mathbf{H}^{-1/2}\Lambda_{m}$

where

$\Lambda m = \left(\lambda 1,\; ...,\; \lambda m\right)$ is the factor pattern matrix

$\mathbf{H}$= diag $\left(h_1, ..., h_n\right)$ is the diagonal matrix of communalities

The transformation matrix T is initialized to $\mathbf{I}_m$ At each iteration *i*

(1) The convergence criterion is

$$\text{SV}_{(i)} = \sum_{j=1}^{m} \left(n\sum_{k=1}^{n} \lambda_{kj(i)}^{*4} - \left(n\sum_{k=1}^{n} \lambda_{kj(i)}^{*2}\right)^2 \right)/n^2$$

where the initial value of $\Lambda^*_m(1)$ is the original factor pattern matrix. For subsequent iterations, the initial value is the final value of $\Lambda^*_{m(i-1)}$ when all factor pairs have been rotated.

(2) For all pairs of factors (λ_j, λ_k) where k>j, the following are computed:

(a) Angle of rotation

P=1/4tan⁻¹(X/Y)

where

$$X = \begin{cases} D{-}2AB/n & \text{Varimax} \\ D{-}mAB/n & \text{Equimax} \\ D & \text{Quartimax} \end{cases}$$

$$Y = \begin{cases} C{-}(A2{-}B2)/n & \text{Varimax} \\ C{-}m(A2{-}B2)/2n & \text{Equimax} \end{cases}$$

$$\text{up(i)} = \int_{pj(i)}^{*2} - \int_{pk(i)}^{*2} - v_{pj(i)} = 2\int_{pj(i)}^{*} \int_{pk(i)}^{*} p = 1, \dots, n$$

$$A = \sum_{p=1}^{n} u_{p(i)} \quad B = \sum_{p=1}^{n} v_{p(i)}$$

$$C = \sum_{p=1}^{n} [u_{p=i}^2 - v_{p(i)}^2] \qquad D = \sum_{p=1}^{n} 2u_{p(i)}^2 - v_{p(i)}$$

If $|\sin(P)| \leq 10{-}15$, no rotation is done on the pair of factors.

(b) New rotated factors

$$\left(\underline{\tilde{\lambda}}\,j(i),\ \underline{\tilde{\lambda}}\,k(i)\right)\left(\underline{\widetilde{\lambda^*}}\,j(i),\ \underline{\widetilde{\lambda^*}}\,k(i)\right) \qquad \begin{vmatrix} \cos(P) & -\sin(P) \\ \sin(P) & \cos(P) \end{vmatrix}$$

where $\lambda^*_{j(i)}$ are the last values for factor j calculated in this iteration.

(c) Accrued rotation transformation matrix

$$\left(\tilde{t}_{j(i)}, \tilde{k}_{j(i)} = t_j,\ t_{k,}\right) \qquad \begin{vmatrix} \cos(P) & -\sin(P) \\ \sin(P) & \cos(P) \end{vmatrix}$$

where tj and tk are the last calculated values of the jth and kth columns of T.

(d) Iteration is terminated when

$$|SV_{(i)} - SV_{(i-1)}| \le 10^{-5}$$

or the maximum number of iterations is reached.

(e) Final rotated factor pattern matrix

$$\tilde{A}_m = \mathbf{H}^{1/2} A_m{}^*(f)$$

where

$$\Lambda^*_m(f)$$

is the value of the last iteration.

(f) Reflect factors with negative sums

If

$$\sum_{i=1}^{n} \tilde{\lambda}_{ij(f)<0}$$

Then

$$\underline{\tilde{\lambda}}_j = -\underline{\tilde{\lambda}}_{j(f)}$$

(g) Rearrange the rotated factors such that

$$\sum_{i=1}^{n} \tilde{\lambda}_{ij} \geq \cdots \geq \sum_{j=1}^{n} \tilde{\lambda}_{jm}^{2}$$

(h) The communalities are

$$h_j = \sum_{j=1}^{m} \tilde{\lambda}_{ji}^{2}\prime$$

3. RESULTS OF THE RESEARCH AND THE DISCUSSION

Geographic Conditions: Location, Area and Administrative Boundary.

Geographically, Sleman Regency stretches from 110$^{\text{O}}$ 13'00" to 110$^{\text{O}}$ 33'00" East Longitude and 7$^{\text{O}}$ 34'51" up to 7$^{\text{O}}$ 47 '30" South Latitude. In the north, Sleman Regency borders with Magelang Regency and Boyolali Regency, Central Java Province, bordering Klaten Regency in Central Java Province in the east, Kulon Progo Regency, Yogyakarta Special Region and Magelang Regency, Central Java Province. and in the south bordering the City of Yogyakarta, Bantul Regency, and Gunung Kidul Regency, the Government of Yogyakarta Region.

Potentially, based on contribution of each sector on Gross Domestic Product at the Sleman Regency of Central Java are a trade, hotel and restaurant, manufacturing industry and agriculture and supporting by others sector. Basically, the culture characteristic of Sleman Regency is an agriculture and tourism people. The Sleman Regency can be called a thousand tourism villages. Based on this characteristic, if we wont to develope the sustainability development model, agriculture and tourism are become the key succes factor to obtain the optimum model. The potencial of Sleman Regency can be shown in
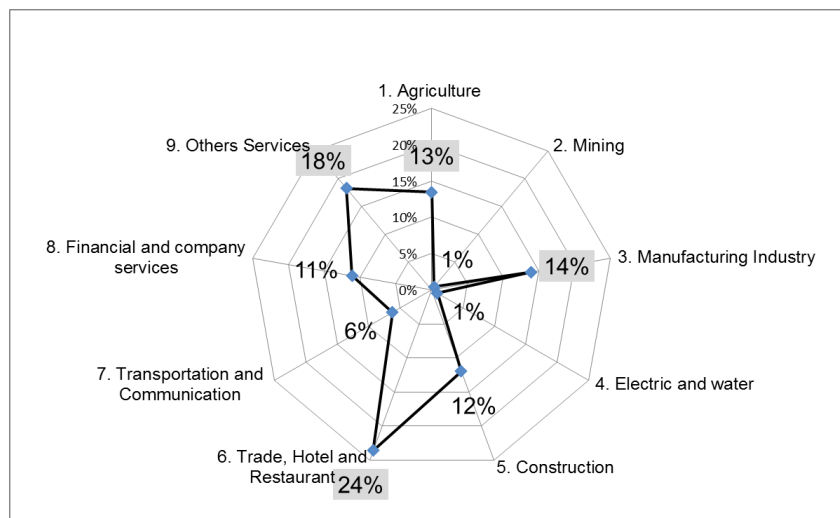

Figure 2.

Figure 2: The potencial of Sleman Regency
Sources: Scundary Data, Sleman Regency in number at the year 2016.

The demographics of the population of Sleman Regency, it can be shown that the majority of the population is at the productive age, and under 15 years of age. Besides that, it is encouraging that the people of Sleman Regency have relatively high life expectancy. In this case the population that has more than 60 years of age is relatively large in number, thus it can be said that the people of Sleman Regency are relatively prosperous and have good labor potential. Based on the survey results in the field, it shows productive performance and has a good working culture, in the field of agribusiness, folk crafts, and trade as well as moving in the tourism sector. Broadly speaking, the demographic conditions of the population of Sleman Regency can be seen in Figure 3.
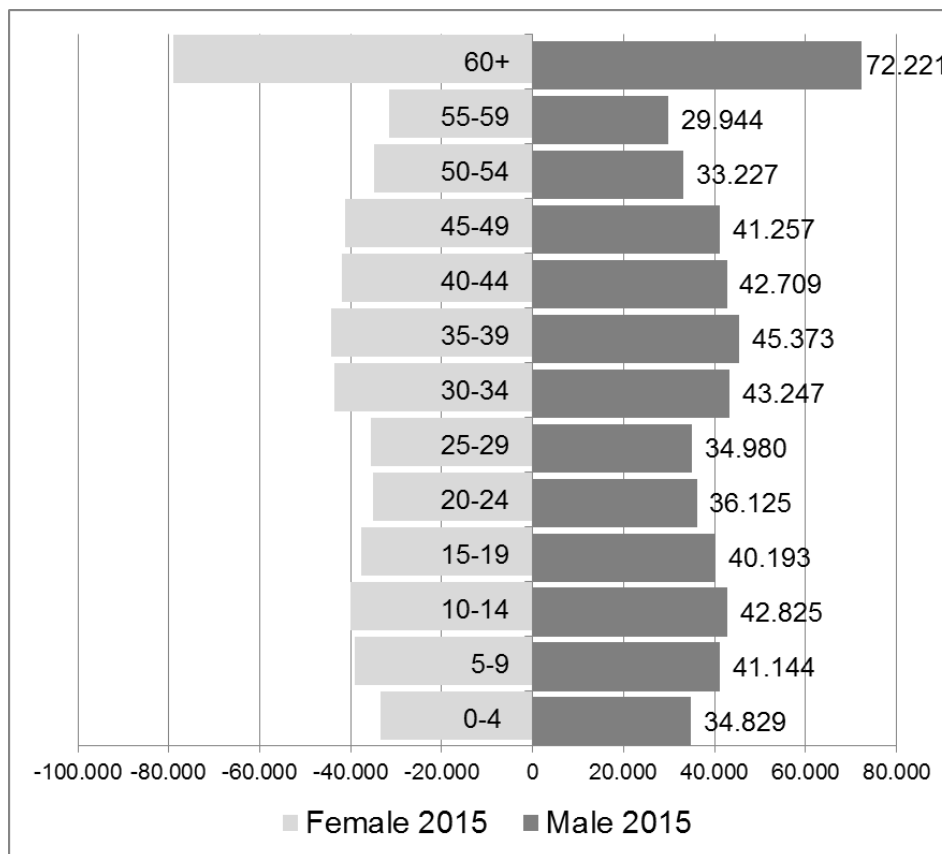

Figure 3: The potencial Demography of Sleman Regency
Sources: Scundary Data, Sleman Regency in number at the year 2016.

Regional Set Plan in the Development Area of Sleman Regency

Based on the identification of the superior potential in each Development Area in Sleman Regency, it can be determined that the growth cover includes; for The Develeopment Area of North Sleman Regency, there are growth rates in Pakem and Turi District with superior products of horticulture, Salak Pondoh, and Etawa Goat with supporting areas in Cangkringan Subdistrict and Kaliurang mountain tourism and Mount Merapi tourism.

The southern Development Area growth cover consists of Mlati, Gamping and Depok Subdistricts, which are centers of trade in hotels and restaurants and markets suitable for processed agricultural products, and have the opportunity to be a Creative Public Space for the main agribis market in Mlati District.

Whereas for the growth of the western Sleman Regency includes Tempel, Seyeg, Godean, and Minggir Districts, including some of Mlati Subdistrict, as producers of rice and polowijo agricultural products, can be positioned as agricultural producers of food crops, and folk handicrafts from bamboo and woven. And to cover the eastern part of the growth, especially in Prambanan, Berak and Kalasan Subdistricts, it is a strategic area that intersects with the strategic area of the Province of DIY and is suitable as a historical tourism, cultural tourism and can be developed in the food and beverage processing industry centers, and has the potential as a craft market. people owned by Sleman Regency. The results of the identification of growth pole can be used as a basis for determining competitive clusters that are capable of synergizing between Organization Goverment Institution(OGIs) and achieving innovative and sustainable development within the framework of Regional Inovation System (SIDa) development policies in Sleman Regency. Broadly speaking, the results of the identification of superior potential and regional framework for the implementation of SIDa can result in a growth rate suitable for developing industrial clusters. Broadly speaking, the graph of superior potential in each Sleman Regency Development Area can be shown in Figure 4.
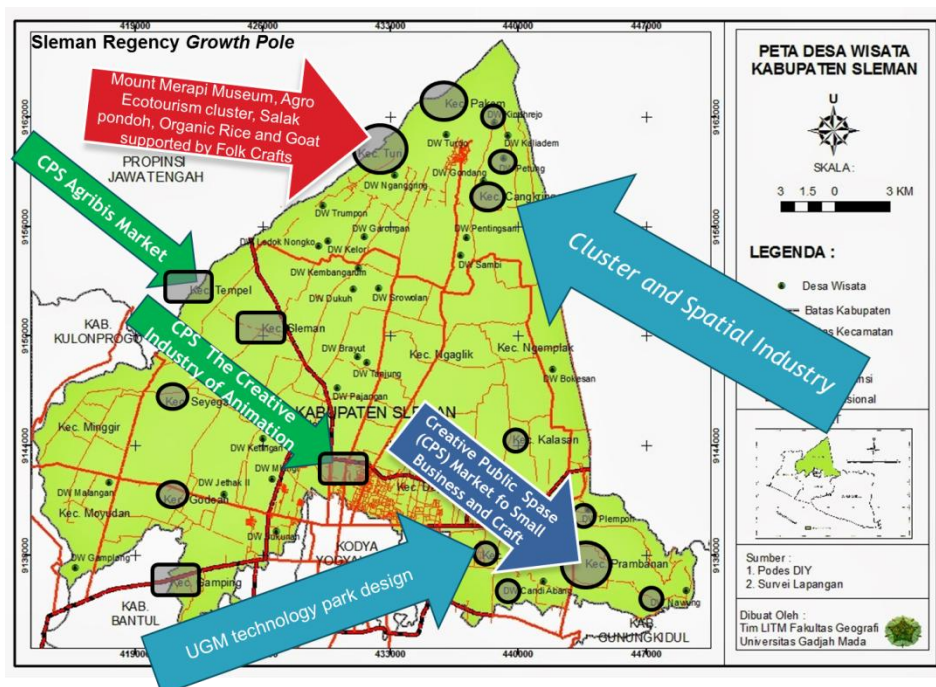

Figure 4: The potencial of Sleman Regency
Sources: Scundary Data, Sleman Regency in number at the year 2016.

Determination of Industrial Cluster Based on Economic Socio-Cultural and Tourism Zoning

Based on the conditions of the factors that influence the determination of industrial clusters in the framework of the concept of economic zoning, the absorption capacity of technology for society, the socio-cultural conditions and tourism have three main factors; Factor 1 is agribis which is represented by variables; (1) The importance of developing infrastructure and public market facilities, terminals and other facilities; (2) The importance of sustaining the extent of rice and rice fields in a sustainable manner in maintaining food security; (3) Potential agrotourism as a superior product; (4) The importance of compliance with land use in accordance with the RTRW that leads to agro-ecotourism.

Then factor 2, namely the tourism factor includes variables; (1) Improvement of infrastructure towards tourist destinations needs to be maintained and improved; (2) Sleman society has the independence of expertise and skills in the field of folk crafts; (3) Concern for the community and tourists in environmental conservation; (4) Agrotourism infrastructure is adequate and environmentally sound, and (5) the level of community participation both self-financing and the contribution of labor force play a major role in the success of the development program.
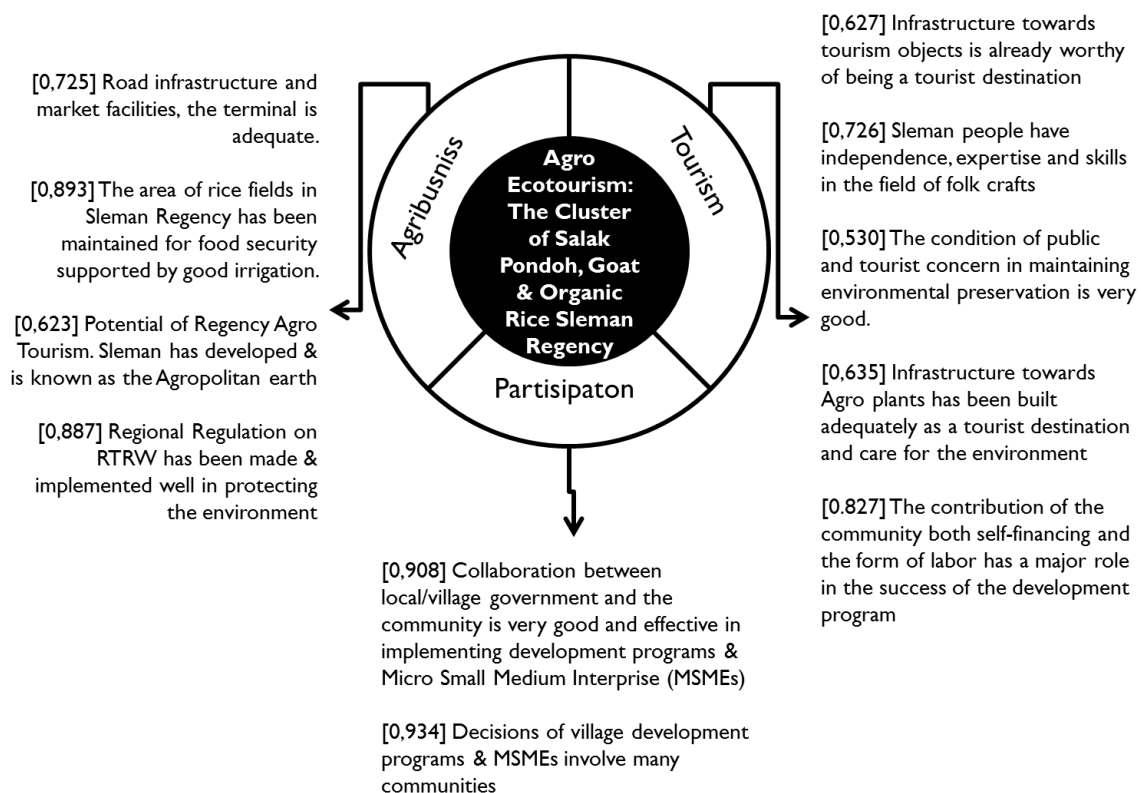
[0,725] Road infrastructure and market facilities, the terminal is adequate.

[0,893] The area of rice fields in Sleman Regency has been maintained for food security supported by good irrigation.

[0,623] Potential of Regency Agro Tourism. Sleman has developed & is known as the Agropolitan earth

[0,887] Regional Regulation on RTRW has been made & implemented well in protecting the environment

[0,627] Infrastructure towards tourism objects is already worthy of being a tourist destination

[0,726] Sleman people have independence, expertise and skills in the field of folk crafts

[0,530] The condition of public and tourist concern in maintaining environmental preservation is very good.

[0,635] Infrastructure towards Agro plants has been built adequately as a tourist destination and care for the environment

[0.827] The contribution of the community both self-financing and the form of labor has a major role in the success of the development program

Agro Ecotourism: The Cluster of Salak Pondoh, Goat & Organic Rice Sleman Regency

Agribusniss · Tourism · Partisipaton

[0,908] Collaboration between local/village government and the community is very good and effective in implementing development programs & Micro Small Medium Interprise (MSMEs)

[0,934] Decisions of village development programs & MSMEs involve many communities

Figure 5: The potencial of Sleman Regency
Sources: Primary Data, The Result of Factor Analysis of Sleman Regency Cluster 2017.

Finally, factor 3 is represented by variables (1) the importance of community cooperation with the village government in the implementation of development program, and (2) the decisions of village development programs and Small Business Enterprise have involved many communities. Based on these three factors, it can be determined that the industrial kalster that will be appointed in the development of Regional Inovation System Sleman Regency is: Industrial Cluster Agro Ecotourism Sleman Regency, with Excellent Products Etawa Goat, Salak Pondoh and Rice Orgnaic. The simple description can be shown in Figure 5.

4. CONCLUSION

1. The results of the identification of the potential conditions of industrial and tourism areas, the potential for investment, and the potential of cooperatives and MSMEs, in supporting the environmental development planning of Sleman Regency.

    a. The results of the mapping of superior potential based on economic, socio-cultural and tourism zoning in support of Regional Inovation System (SIDa) of Sleman Regency shows that, in the northern part of Sleman District I Development Area includes; Pakem, Turi and Cangkringan sub-districts have excellent potential as producers of salak pondoh hroticulture, organic rice, and etawa goat farms supported by Kali Urang and Mount Merapi tourism areas. In this case Tempel District can function as an agro market creative public space that is able to mediate the creativity of the surrounding community, and to accommodate the production of salak pondoh, black and red organic rice, and PE goat milk processed.

    b. The Southern Sleman Regency Development Area includes: Mlati, Godean, Depok and Gamping Subdistricts. The majority have the potential to trade hotels and restaurants, suitable for creating creative public spaces for markets processed by agricultural production in Godean, and Agro markets that have developed in the community precisely in Gamping District. In order to optimize its development it can be supported by the BUMD, BUMDes / cooperatives that are integrated in the SIDa framework structure.

    c. The area of development in the eastern part of Sleman Regency, especially in Kalasan District, Prambanan and Berbah has the potential of historical and cultural status, and has a strategic position in contact with provincial roads suitable as transit areas and tourist destinations. It is necessary to develop the Creative Public Space Geopark, cultural heritage, and MSMe which can become the competitiveness of Sleman Regency.

    d. Excellent potential in the development region of the western Sleman Regency includes Seyegan, Minggir, Tempel Subdistricts, including Mlati, which has excellent potential in the agricultural and folk handicraft sectors. The important thing is to connect with the creative public space in

the Southern Development Region as a trade center for hotels and restaurants, in order to distribute agricultural products and processed agricultural products and folk handicrafts. In this region it is necessary to develop black and red organic rice, as suppliers of existing markets in Sleman Regency and other regions, given its huge potential associated with agricultural land, including supporting the market in Tempel, and the center of Sleman Regency.

2. The Framework of Economic Socio-Cultural and Tourism Zoning
Results of mapping the economic and socio-cultural zoning in support Determination of the innovative regional framework for the implementation of SIDa can be determined, namely: for the agro-ecotourism area can be placed in the North Sleman Regency Development Area covering Turi, Pakem and Cangkringan Districts with excellent Kaliurang tourism, and Mearpi Mountain Tourism and there is already a Creative Public Room of Mount Merapi Museum. While the market can be connected to the agro market in Tempel and those in Gamping District, including the Geopark Creative Public Room, the MSMEs product market is in the Prambanan area and its surroundings.

3. Determination of industrial clusters in supporting SIDa Sleman Regency
Based on the results of factor analysis there are three main factors, Factor 1 is agribis which is represented by variables; (1) The importance of developing infrastructure and public market facilities, terminals and other facilities; (2) The importance of sustaining the extent of rice and rice fields in a sustainable manner in maintaining food security; (3) Agrotourism potential as a superior product in this case salak pondoh, red and black organic rice and goat PE farms; (4) The importance of compliance with land use in accordance with the RTRW that leads to agro-ecotourism. Then factor 2, namely the tourism factor includes variables; (1) Improvement of infrastructure towards tourist destinations needs to be maintained and improved; (2) Sleman society has the independence of expertise and skills in the field of folk crafts; (3) Concern for the community and tourists in environmental conservation; (4) Agrotourism infrastructure is adequate and environmentally sound, and (5) the level of community participation both self-financing and the contribution of labor force play a major role in the success of the development program. Finally, factor 3 is represented by variables (1) the importance of community cooperation with the village government in the implementation of development, and (2) the decisions of Village development programs and MSMEs have involved many communities.
Based on these three factors can be determined industrial cluster that will be appointed in the development of SIDa Sleman Regency, namely: Agro Ecotourism Cluster with Featured Products Salak Pondoh, Etawa Goat, and Rice The red and black landscape of Sleman Regency is in the framework of Turi, Pakem and Cangkringan Districts. Supported by the agro market in

Tempel and Gamping District, as well as the Creative Public Space area around Prambanan Subdistrict, as a center of art and culture, geopark park, and folk handicraft and other MSMEs markets.

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