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Regional innovation system in Riau Province, Indonesia

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ABSTRACT

Regional autonomy, geographical spread, as well as the social and cultural diversity of Indonesia should be an important factor for the strengthening of the Regional Innovation System. This paper dealt with the implementation of the Regional Innovation System in Riau Province viewed from the dimension of the system context "Collaborative Governance". This model is seen from the framework of Collaborative Governance by looking at resources condition, policy and legal framework, level of conflict and socio-economic background. Riau Province has been considered as a potential to strengthening of the Regional Innovation System.

Key words: *Regional Innovation System, System contexts*

Introduction

Innovation is a fundamental influence on national and global economic development. The new combination created by innovation thinkers whch is a driving force in efforts to improve competitiveness and economic growth. In order to encourage such innovation capabilities, issues on opportunities as well as challenges must be taken into account to build a solid innovation system. South Korea is one of an example. She managed to develop rapid innovation. Within three decades South Korea managed to become a highly competitive nation (Cooke *et al.,* (1997). Meanwhile, in Indonesia, the innovation system seems to be at the early stage eventhough the Government of the Republic of Indonesia has issued the Law of the Republic of Indonesia Number 18 of 2002 on the National System of Research, Development, and Application of Science and Technology (Sisnas Litbangrap Iptek) which was passed on 29 July 2002. This regulation is the main legal basis to strengthen the carrying capacity science and technology for the purpose of accelerating the achievement of state objectives, as well as enhance competitiveness and independence in the struggle for the interests of the country in international relations.

The Government of the Republic of Indonesia through the Ministry of Research and Technology has also launched the National Innovation System Research and Technology program (Since Ristek)

explicitly mentioned in the National Medium Term Plan 2010-2014 Science and Technology. The National Innovation System itself has actually grown since the 1980s in various countries in Europe and the United States. The initial concept of the National Innovation System (NIS) began when Christopher Freeman collaborated with the IKE group in Aalborg, Denmark, from the research collaboration project that early versions of NIS were formed (Freeman, 1987; Lundvall, 1992). This NIS concept began to be widely diffused through a book made by Christopher Freeman in 1987 on NIS in Japan (Dosi *et al.,* 1988). Departing from the research, research on the national innovation system began to develop.

Developments in various countries show that locality factors are increasingly recognized as a determining factor of competitive advantage. After the introduction of the concept of the National Innovation System (SINas), several scholars developed the concept of 'derivative' Regional Innovation System. The Regional Innovation System puts forward the importance of localized learning processes (Cooke *et al.,* 1997; Cooke, 2001; Doloreux and Parto, 2005). Cooke (2001) added that the concept of the Regional Innovation System sees the importance of cultural factors and the heterogeneity of contexts that influence local interaction and learning. The Ministry of Research and Technology is also developing the Regional Innovation System by issuing a joint regulation of the State Ministry of Research and Technology with the Ministry of Home Affairs No. 03 of 2012 and No. 36 of 2012 on Strengthening the Regional Innovation System. It is also very relevant to the condition of Indonesia and is acknowledged by the government and other stakeholders. The regional autonomy, geographic spread, and social and cultural diversity of Indonesia should be an important factor for the strengthening of the Regional Innovation System (SIDa) which refers to the concept of Regional Innovation System (Rauf, 2018; Zainal *et al.,* 2011; Zainal *et al.,* 2012). This Regional Innovation System (SIDa) is an important pillar in strengthening national innovation system (SINas). Therefore, within the framework of strengthening innovation system in Indonesia, the dimension of locality is very important in paying attention to the local wisdom of each region (Rauf *et al.,* 2016; Rauf, 2018; Sulaiman and Razman, 2010; Zainal *et al.,* 2011; Zainal *et al.,* 2012).

This paper deals with the implementation of Regional Innovation System (SIDa) in Riau Province seen from the dimension of the system context "Collaborative Governance". Collaborative governance as a process and structure in the management and formulation of public policy decisions involving actors constructively coming from various levels, both at the level of government and/or public institutions, private institutions, and civil society in order to achieve unachievable public goals if implemented by one party only. This model is seen from the framework of Collaborative Governance (Emerson *et al.,* 2011) which has three dimensions, namely system context, drivers, and dynamics of collaboration. In this paper, the perspective of the discussion is devoted to the dimension of contexts system "collaborative governance".

A system context in Collaborative Governance will work when there are components that answer why Collaborative Governance is necessary for the implementation of a program or public policy. These components will encourage the process and development of Collaborative Governance (Emerson *et al.,* 2011). System context elements that can differentiate or affect Collaborative Governance that is formed, among others, the first resource condition describes the condition of the resources owned whether it needs to be improved, improved or even restricted (Razman *et al.,* 2009a, Razman *et al.,* 2009b; Razman *et al.,* 2009c). Second, the policy and legal framework include administration, regulation or judiciary (Razman and Azlan, 2009). Third level of conflict/ trust, historical level and the occurrence of conflicts between the interests of each party working together and how the conflict affects the level of trust that affects the employment relationship (Razman *et al.,* 2010a; Razman *et al.,* 2010b). Next, the socio-economic, namely portrait of social, economic, health, cultural and diversity conditions that are formed in a sheltering environment (Razman *et al.,* 2010c) and finally is network connectedness (Razman *et al.,* 2011; Razman *et al.,* 2012).

Resources Owned by Riau Province

Riau Province has considerable potential in various sectors, especially Natural Resources (SDA) in the form of mining of Oil and Gas (Oil and Gas), both on land and offshore. This potential is also supported by forestry, the potential of oil palm, coconut and rubber plantations and other commodities. Another potential is the relationship of both sea and air, as well as tourism and supporting infrastructure

so that the potentials can support various development activities in various fields of development in Riau Province (Rauf, 2018).

According to the Central Bureau of Statistics (BPS) of Riau Province, the export value of Riau Province is quite large, consisting of Oil and Gas (Oil), in the form of Crude Oil, Oil and Natural Gas, while non-oil and gas are agriculture, industry and mining products, reaching about U$ 12,780.9 even more. Followed by potential forest area and industrial forest plantation that support the large production of Pulp and Paper with two big factories scale, Southeast Asia. Potential forests are conservation forests, protection forests, mangrove/mangrove forests and production forests. Forest products are not only logs but also processed wood products. The result of such a large oil and gas mine is also accompanied by the expansion of oil palm plantation area with a large number of large and small companies that have many large scales and small-scale PKS (Palm Oil Factory) with core and plasma plantations. The amount of export value, Dumai ocean ports available facilities and oil ports CPO (Crude Palm Oil). Potential plantations and oil and gas will continue to grow so that the potential of Riau Province growing in the future. In addition, the agricultural sector in a broad sense is also quite potent in the field of food crops, especially livestock farming potential. Rice production in Riau in 2015 reached 393,917 tons of dry milled grain (GKG). The production has increased by 2.2 percent, compared to production in 2014. The increase in production is influenced by the increase in the area of harvest area of 107,546 hectares. This harvested area increased by about 1,509 (1.42%) compared to the previous year. In addition, rice productivity also increased by about 0.26 quintals/hectare or about 0.71%. In corn production increased by 30,870 tons, ie dry pipeline. This production decreased by about 7.75 percent or 2,219 tons of dry kiln. This increase could be affected by the increase of corn production area by 368 hectares (3.1%) compared to 2014 production area of 12,057 hectares. The increase also occurred in maize productivity by 2015 of 1.09 quintals/hectare from 2014 or about 4.59%. Meanwhile, soybean production also declined in 2015 by 187 tons of dry beans (8.02%) of soybean production in 2014. The decline in production is affected by the 1,516 hectares harvested area of approximately 514 hectares (25.32%). But the productivity of maize increased by 2.66 quintals/hectare or 23.15% compared to the previous year (Rauf *et al.,* 2016).

However, the Government of Riau Province is now beginning to look seriously digging other sources of income, in addition to expecting from the Oil and Gas sector (Oil and Gas). But this will be developed also from the non-oil and gas sector especially from the tourism sector. Moreover, Riau province has big potential this sector. Development of tourism in the region and aims to increase the local economic potential of the community. These efforts have been described in the direction of long-term development of Riau Province. The oil and gas sector has recently been experiencing a decrease in revenues earned by the decreasing of DBH acquisition every year from the central government. In the infrastructure sector, especially the bridge as a means of transportation has a very important role in the smooth movement of traffic. The function of the bridge is to connect routes or separate transport routes by rivers, swamps, lakes, straits, canals, highways, railways and other crossings. So the government is always trying to improve the development of this infrastructure. In the last three years in Riau Province, there are 1013 bridges with a total length of the bridge that is 28.14 Km until the end of 2014. In addition, the Government of Riau Province also continues to strive to increase road construction to support social activities, economic and community of Riau Province which continues to grow dynamic (Rauf 2018).

Policy and Legal Framework

Following up the Joint Regulation of the Minister of State for Research and Technology of the Republic of Indonesia and the Minister of Home Affairs of the Republic of Indonesia Number 03 Year 2012 and Number 36 Year 2012 on Strengthening Regional Innovation System (PSIDa), Riau Provincial Government poured in RoadMap which expected results can be disseminated in RPJMD 2014 -2018. Involving team formed by Riau Provincial Government comes from Academician, Business and Government (ABG), meant that Regional Innovation System in Riau Province can build networking between Provincial Government, Regency, and City as Riau Province and investor, so that can be achieved economic growth area high competitive, inclusive and sustainable. Especially in menyukseskan Masterplan Program Acceleration and Expansion of Development Indonesia (MP3EI) 2011-2025 (Rauf *et al.,* 2016).

Implementation of Regional Innovation System (SIDa) in Riau Province aligned with RPJMD and RJPD where strategy and policy direction of SIDa strengthening of Riau Province based on vision of Riau 2020 that is "The realization of Riau Province as Center of Economic and Culture of Malay in Environment Society which is Prosperous, Prosperous and Bathin in Southeast Asia in 2020". Missions related to strengthening Regional Innovation System are as follows: (1) Improve the performance of professional and moral Regional Government through exemplary leaders and apparatus; (2) realizing quality human resources as a continuation of alleviation of ignorance; (3) strengthening the balance of interregional development as a continuation of infrastructure development; (4) increasing the economic development based on resource potentials and small and medium enterprises and the empowerment of populist economy through the strengthening of cooperatives and small and medium enterprises as a continuation of poverty alleviation; (5) increase investment to support the growth and development of an established economy; (6) Increasing rural and institutional role in rural development; (7) realizing the Malay culture to be the umbrella of regional culture and the unifying tools of various cultures in Riau Province; (8) improve environmental quality and environmental protection; and (9) improving and handling regional and global problems in an integrated and sustainable manner (Rauf 2018).

The condition of the Regional Innovation System (SIDa) in Riau Province is currently described as referring to the Innovation policy framework determined based on regulation, potential, and regional specificity consisting of 5 Pillars namely: (1) Strengthening pillar of regional innovation system (SIDa). (2) Pillar of industrial cluster strengthening. (3) Pillar of network innovation strengthening. (4) Pillar of technopreneur strengthening. (5) Pillar of local thematic development. Based on the results of field research through collecting data and process wawacara with Head of Research and Development Agency of Riau Province and Chairman of Coordination Strengthening System Innovation Area (PSIDa) Riau Province, can be described in general condition SIDa current in Riau Province based on target which have been reached and which will be achieved from 2013 to 2017. For example, the strengthening pillars of innovation are the institutional and technological, technological and innovative support, or research, development, and engineering as well as the absorptive capability of specialized industries of micro, small and medium enterprises. Program and activities undertaken are to establish institutional strengthening innovation system, Riau Province, until now not yet and have not yet formed, even though have been budgeted equal to Rp.500.000.000, - per year. However, the current condition is not sufficient and the people's absorption towards Iptekin is still limited (Rauf *et al.,* 2016).

Level of Conflict/ Trust

Glancing at the national level, land and natural resource conflicts from year to year continue to increase. Throughout 2016, the Indonesian Ombudsman recorded 450 agrarian conflicts with an area of 1,265,027 hectares. Plantations ranked highest, with 163 conflicts or 601,680 hectares, mostly in oil palm plantations. The second order of forestry sector is 450,215 hectares, property 104,379 hectares, oil, and gas 43,882 hectares, infrastructure 35,824 hectares. Then 27,393 hectares of mining, coastal 1,706 hectares, last agriculture five hectares. Ombudsman noted conflict spread across 34 provinces, with six highest conflict contributors, among others: Riau 44 conflict (9.78%), East Java 43 (9.56%) , West Java 38 (8.44%), North Sumatra 36 (8.00%), Aceh 24 (5.33%), and South Sumatera 22 (4.89%) (Rauf, 2018).

Researchers capture the root of the problem is the existence of social and regional disparities, policy distribution and legalization between companies and society. For example, the plantation giant controls five million hectares of tenure. This condition occurs because there is an imbalance in the rules of land tenure and forest permits. In HGU permits, concession holders may control 100% of land and in forests can control 80%, with 20% of protected areas and community crops. For that reason, the Government needs to review the HGU plantations of companies that have completed the licensing period and redistribute it to the community to accelerate the agrarian reform commitments.The government needs to discuss 100% HGU control by residents. Ombudsman re-recorded, now only 3% of land controlled by the community either in the form of community plantations, village forests, community forests and transmigration land. As a result, agrarian reforms are not solutive, because the victims of violence are farmers, smallholders, small fishermen who are lost by development to a high economic gap (Rauf, 2018).

Socio-economic of Riau Province

The growth and development of a region's economy are caused by many factors. These factors include the construction of various transportation facilities and infrastructure such as roads and bridges, the construction of factories, markets and other places of business both traditional and modern (Emrizal and Razman, 2010). So, in turn, popping up various economic activities as a driver of the economy in the region. Similarly in Riau Province. The local government with all its ability to continue to cooperate with each other to improve the performance of the government to dig and empower the regional economic potentials so that it continues to grow and develop from time to time (Rauf *et al.,* 2018).

From the 2006 Economic Census results ten years ago it was noted that 1.61 percent of the total number of businesses/companies in Indonesia are located in Riau Province. The number of businesses as many as 366,715 business units/companies are spread in various business fields/economic sectors not including the agricultural sector. Among other things in the field of large and retail trade as much as 203,586 businesses/companies; business field of providing accommodation and drinking water supply of 51,269 businesses/companies; field of transportation, warehousing and communication business of 26,854 businesses/companies; social service, social, cultural and other business field as many as 25,486 businesses/companies; field of processing industrybusiness 22,095 enterprises/companies; and the least is the mining and mining business field of 954 businesses/companies. From 10 provinces in Sumatera Island, the number of businesses in Riau Province occupies the sixth position in Jambi, Bengkulu, Riau Islands and Bangka Belitung with 235,019 units, 141,379 units, 100,172 units and 74,779 units. While the province that has the most business/company in North Sumatra Province with the number of businesses/companies as much as 1.056.553 units (Rauf, 2018).

The top three business fields absorbing manpower in Riau is a large and retail trade field of 359,472 people; the processing industry business field is 111,623 people; and the business field of accommodation and drinking water supply is 105,726 people, while the three employment fields that occupy the least labor are private business service field which serves household as big as 3,571 people; electricity, gas and water utilities field of 4,053 people; and mining and quarrying field of 6,138 people. All businesses/companies are spread in various districts/cities in Riau, namely Kuantan Singingi as many as 21,450 businesses/companies, Indragiri Hulu as many as 26,488 businesses / companies, 13,924 Pelalawan as many as 13,824 businesses / company, Kampar 45,465 businesses / companies, Rokan Hulu as many as 27,074 businesses / companies, Bengkalis (still merged with Meranti Archipelago) as many as 42,029 businesses, Rokan Hilir 34,036 businesses, Pekanbaru 67,728 businesses, and Dumai 20,782 businesses / companies. As many as 38 percents of businesses/companies, the location of a business are in place is not fixed and able to absorb the labor of 171 thousand people who are generally business owners. While the total workforce reached 837 thousand people (Rauf *et al.,* 2016).

On average, every business in Riau employs 2 workers. Absorption workforce in Pekanbaru, from 68 thousand existing business was able to absorb about 181 thousand people (22 percent), then in Kampar as many as 93 thousand people. Meanwhile, the business in Pelalawan absorbs the workforce of 35 thousand people. Interestingly enough to note, the effect of division region is a very positive impact on business growth/company. Examples such as the number of businesses /companies of Bengkalis Regency and the number of business/company division far beyond the number of businesses/companies in Pekanbaru City which amounted to 119,795 businesses/companies or 176.88 percent. Likewise with the number of businesses/companies Kampar regency and the number of businesses/companies division region is above the number of businesses/companies in Pekanbaru city of 76,363 businesses/companies or by 112.75 percent. All business activities in Riau almost half moving in the category of large and retail trade that amounted to 56 percent or about 204 thousand businesses. Most of these efforts are concentrated in Pekanbaru, Kampar, Indragiri Hilir, Bengkalis, and Rokan Hilir. In addition to large and retail trade, other categories are quite dominant, some of which are accommodation, food and beverage (14 percent), transportation, warehousing and communication (7 percent), social services, social, cultural and other individuals percent), and processing industry (6 percent). While the category of business is very little to do is Mining and Quarrying that is only 954 businesses or about 0.26 percent. Most of the existing

businesses in Riau are businesses that have a micro scale. The number of micro-scale enterprises reached 81 percent or as many as 297 thousand businesses, while small-scale only 18 percent or as many as 66 thousand businesses. On a large and medium scale, the number of businesses does not reach one percent. The number of large and medium scale businesses, each of 820 and 2,988 businesses. Large-scale business is mostly located in Pekanbaru with 335 businesses, as well as medium enterprises in Pekanbaru with a total of 1,317 businesses. In general, the category of Large and Retail Trade is the category with the largest number of business from a various business scale. On a large scale, there are 364 businesses in the category, while medium, a small and micro scale of 1,169 businesses, 43 thousand businesses and 159 thousand businesses, respectively (Rauf, 2018).

Network Connectedness

The development of regional innovation system does not stop at one perspective, but can be seen from various perspectives. As with the application of the regional innovation system in Riau Province, the development of oil palm potential as the main commodity can be directed to the employment network. For example, in the Pelalawan District, The potential downstream palm oil industry to be developed in the Pelalawan Technopolitan Region is the cooking oil industry, margarine, fatty acid (FA), methyl ester (ME), methyl ester sulphonate (MES) and biodiesel surfactant. To realize the various types of downstream industries, it takes a large amount of manpower. In summary, using the production process approach, the amount of work required for each type of downstream industry of palm oil is as follows: (1) First, the labor demand for the cooking oil industry capacity of 1,000 tons of CPO per day. The number of workers directly involved in the production process, or referred to as direct labor, is 134 people consisting of 128 operational personnel and 6 managerial personnel. Out of 128 operational personnel, 18 of them do managerial work and 110 others work as operational staff. In addition, every year it is estimated that the company will need a daily workforce to help with the process of refining and fractionation. (2) Second, the labor demand for margarine industry capacity of 1,000 tons per day of direct labor to operate the margarine industry capacity of 1,000 tons per day is about 75 people, both for managerial and operational. (3) Third, labor requirements for the industry are fatty acids and methyl esters. Workers in the industries of fatty acids and methyl esters are also broadly grouped into managerial and operational manpower. The managerial workforce consists of directors, managers, assistant managers, supervisors and section heads. Overall, labor requirements for the industries of fatty acids and methyl esters are estimated to reach about 300 people each. (4) Fourth, labor requirements for the MES surfactant industry. The need for direct labor, both managerial and operational, for the MES surfactant industry is estimated at 100 people, all of whom are well-educated experts because the MES surfactant industry includes high-tech industries. (5) Fifth, labor demand for biodiesel industry capacity of 1,000 tons CPO per day. The biodiesel industry is an industry whose absorption rate is relatively equal to the cooking oil industry from palm oil. Therefore, the amount of labor needed by the biodiesel industry with a production capacity of 1,000 tons of CPO per day is 134 people. In Indonesia, the number of biodiesel industry that has been operating until now there are 11 units, with the number of direct labor absorbed estimated to reach 1090 people (Rauf, 2018).

In order to meet the needs of ready-to-use workers in various types of downstream palm oil industry above, until now Pelalawan Regency has not been ableto provide it. Professional and educated human resources that exist in this regency is still very limited. Therefore, in the short term professional and educated human resources must be imported from other regions outside Pelalawan District. But in the medium term and long term Pelalawan Regency is expected to be able to meet the needs of ready-to-use workers in various types of downstream oil palm industry independently (Rauf, 2018).

Conclusion

Innovation is a fundamental influence in national and global economic development. Regional autonomy, geographical spread, and social and cultural diversity of Indonesia should be an important factor for the strengthening of the Regional Innovation System (SIDa). This is highly relevant to Indonesia's condition which consists of autonomous regions with diverse potentialities. This paper deals with the implementation of Regional Innovation

System (SIDa) in Riau Province seen from the dimension of the system context "Collaborative Governance". This model is seen from the framework of Collaborative Governance (Emerson *et al.*, 2011) by looking at the resource condition aspect to explain the condition of the resources owned whether it needs to be improved, improved or even limited. Second, the policy and legal framework include administration, regulation or judiciary. Third level of conflict/ trust, historical level and the occurrence of conflicts between the interests of each party working together and how the conflict affects the level of trust that affects the employment relationship. Next, the socio-economic, namely portrait of social, economic, health, cultural and diversity conditions that are formed in a sheltering environment and finally is network connectedness. Conclusion, Riau Province has considerable potential in various sectors, especially natural resources (SDA) in the form of mining of oil and gas; both on land and offshore. This potential is also supported by forestry, the potential of oil palm, coconut and rubber plantations as well as other commodities, but the stakeholders have not succeeded in building collaboration based on consensus and joint participation.

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