Maturity analysis of the innovation system in the livestock industries of West Sumatra, Indonesia

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Abstract. The main objective of this study was to analyse the ANIS of Livestock industry in West Sumatera according to its main determinants. This research aims to know and understand the maturity level of the regional innovationsystem of West Sumatra livestock industries , including recommendation for improvements. The maturity level of the regional innovation system was analyzed with the ANIS method by using an opinion survey to some experts from businessmen, government and universities. This expert opinion survey was conducted to measure expert perceptions on the implementations of determinants of west Sumatera regional innovations systems on livestock industries on macro level (innovations policy), mezzo level (innovation institutions and programs) and micro level (innovation capacity). By using Likert method, the result showed maturity level for the West Sumatra livestock industries innovation system was still develop. This is caused by low maturity in the macro and meso determinants which are at the central and regional government side. This research result may be useful as recommendations for the government for improving the maturity level and may be a basic for incoming researches to identify regional innovation system determinants with low maturity to improve.

1.Introduction

One of the great potential that is owned by the Province of West Sumatra in the development of the regional economy is the livestock sector, where the vision of the future development of livestock breeding is to realize advanced, efficient and resilient, competitive, independent and sustainable economic and simultaneously able to empower people, especially in the countryside therefore, directed livestock development in order to compete in national and international markets, strengthen national food security to food self-sufficiency, and increase the contribution of livestock in the Gross Regional Domestic Product (GDP). To establishfood security, attention tofood self-sufficiency program to meet the needs of animal protein per capitashould be increased to improve.Increasing the competitiveness of the livestock industry products can boost the local economy and, ultimately, improvepublic welfare western Sumatrahave almost all kindsof farm products such as meat, eggs, milk, leather and processed products.However, the production capacity andthe added valueoft hefarmcommodities have not been as expected. This plus there are many imported mainly meat and milk and derivative products nationally.

It is necessary to develop a strategy for the development of animal husbandry accurate. The development of the livestock industry has good prospects caused by the demand for materials derived from cattle will continue to increase in line with increases in population, income and awareness to consume foods high in nutrients. Innovation in West Sumatera existing farm and running, but has not been able to improve the competitiveness and economic improve. It is believed due to the lack of an

integrated system. One strategy that can be put forward is to combine various concepts, namely the concept of the Regional Innovation System , the system of agribusiness, farm-based integrated region with attention to environmental sustainability. With this model expected above problems can be overcome, so that self-sufficiency in livestock products can be realized in order to build a strong food security and sustainable.

The important question is the extent to which the level of maturity Regional Innovation System in West Sumatra to improve the competitiveness of the livestock industry. In it, the extent to which there is completeness and the involvement of actors and facilitation support at each level of the macro, meso and micro regional innovation system sumatera. .Measurement of the maturity level using ANIS (Analysis of Nations Innovation Systems in the livestock industry in West Sumatra.

To answer the second question above, has made the identification of activities that can map the degree of maturity of innovation system livestock industry in west). The maturity level can be obtained from the perception of businessmen, academics and local government officials who are involved as actors and observers of regional innovation systems. Based on the formulation of the problem mentioned above, the proposed research with a common purpose, The main objective of this study was to analyse the ANIS of Livestock industry in West Sumatera according to its main determinants namely the identification of the level of maturity of the livestock industry innovation system of West Sumatera in increasing production capacity and added value to the competitiveness of livestock products . This study has several output targets as the specific purpose of knowing the perceptions of actor and observer of regional innovation systems consisting of businessmen, academics, and Local Government, determine the level of maturity of regional innovation systems west of livestock industry at every level of the macro, meso and micro, and issued a recommendation intervention to increase the maturity of innovation by building and / or strengthening actors- actor and facilitation of regional innovation systems.If the goal is reached, it will obtain various benefits from the results of this study, among others, the results of this study can determine the order of priority the establishment and / or strengthening factors of maturity of the innovation system based on minimal effort with maximum impact on industrial innovation system maturity of livestock.output this research can determine the roadmap plan of action to strengthen the regional innovation system in west sumatera. this research could create regional innovation systems that can improve the competitiveness of industrial products farms with increased production capacity and value-added.

2. Materials and Methods

The model used draws on a wide range of data from the Expert Opinion Survey (EOS). The EOS meets the need for up-to-date and far-reaching data, providing valuable qualitatively information for which hard data sources are scarce or nonexistent. The survey was completed by at least 20 national experts for each country. We asked the experts to provide their opinions on various aspects of innovation and the innovation environment in which they operate. The data gathered thus provide a unique source of insight and a qualitative portrait of each nation's innovation concept and how it compares with the situation in the other country.

ANIS approach is based on the assumption that innovation systems is strongly influenced by the opinions of the actors determinant of government, universities and the private sector each reflecting aspects of the innovation system. The determining factors can be grouped into three levels [1], namely:

a. Levelmakro (policy), which includes the national innovation policy, innovation policy areas, master plan, training and education, R & Dforesight, cluster policy, regulatory innovation.

b. Meso level which includes:1. Institutional innovation consists of a technology transfer center, technopark, technology incubators, clusters, business promotion agencies, service providers innovate and innovation funding agencies.2. The supporting program inovation consists of STI financing scheme, a program of basic research, applied research program, co-financing schemes STI assistance efforts, support entrepreneurship, cluster development programs, and international support.

Micro level (innovation capacity) including universicity, basic research institutions, private research institutions, innovators, private investors, entrepreneurial, technology-based SMEs and large industry-based technology.

The questions in the study follow a structure that asks the interviewees to evaluate, on a scale of 1 to 4, the current conditions of their particular operating innovation environment. At one end of the scale, 1 represents the worst possible operating condition or situation and at the other end of the

scale, 4 represents the best (see figure 4). Indicator values above 3 are characteristic for well developed industrial countries where all determinants are established and well functioning, some slightly better than the others. A value between 1.5 and 3 means the determinant already exists and is in the phase of development. Values below 1.5 mean that a specific determinant may exist, but is not really operational in practice or it needs improvement.

3.Results And Discussion

By ANIS method can be seen the results of the maturity level of the Regional innovation system for livestock industry of west Sumatera in figure 1below.
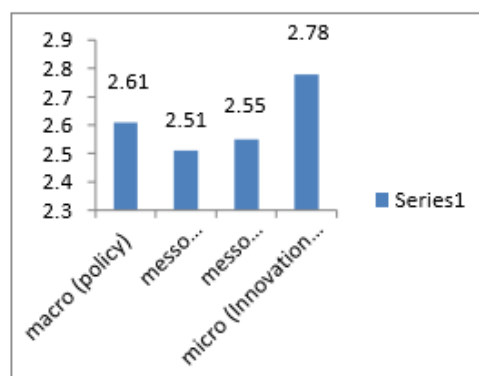

Figure 1. The average value of each level (top) and the levels below and above the overall average value (bottom)

The average value of each level and the levels below and above the overall average. The average value of the entire questionnaire is 2.61 on a scale from 1 to 4. This value indicates above 2.5 as the mean scale Lickert. This means that the respondents argued among disagree and agree that the Regional Innovation System for the livestock industry has been implemented in West Sumatra.

The figure 1 above also shows the average value of each level group comprising the macro level, meso-level institutional, meso-level programs, and micro level. Macro level are in the same position with the average value of the whole is 2.61. Meso level of both institutional and program is under the average value is the mean level of the weakest, especially on the institutional aspects. The highest level value is at the micro level, namely the innovation capacity for the livestock industry which shows the value above the overall average, which means that this level is the most mature in the innovation system ranch in West Sumatra.

Macro level were in the same position with the overall average value was 2.61.The lowest value occurred in the National Innovation Policy was 2.50, while the highest values were in theEducationand Training Policy 2,86.

The meso level for institutional support aspects of innovation was at 2.51 which is the lowest position in average group level. At the messo level, the lowest value occurred in the institutional Technopark with valueof 2.28, while the highest value was at the Institute of Business Promotion with a valueof 2.69.

The values determinant group messo leve lof innovation support programs. The messo level was in the low position was 2.55. At this level, the lowest value of the determinantis on Facilitation/Support

International with a valueof 2.35, while the highest score was on Facilitation/Support Entrepreneurship with a value of 2.85. The values of the micro-level determinants of the group that has the highest value was 2.78. At this level, the lowest value of the industry was in engagement with a value of 2.62, while the highest value was at university with a valueof 2.89 which is a determinant for the overall highest level.

At the meso level institutional innovation average value of 2.51, there was a determinant which is under the value that Technopark, Incubator, and livestock Cluster .Institute the form of Technology Transfer Center, Institute of Business Promotion, Innovation Service Providers and Institutions Financing Innovation in West Sumatra for the livestock industry, including the determinants of mature or above average on the meso level institutional innovation

Respondents assess determinants on the meso level to aspects of the innovation program, on average, at a value of 2.55 is not much different from the meso level institutional innovation. At the meso level, there are five programs were rated below average ie Financing Scheme of Science, Technology and Innovation (STI), Basic Research Program, the Joint Funding Scheme, Cluster Development Program, and facilitation following Internasional.Determinan, Applied Research Program, Assistance efforts of Science, Technology and Innovation (STI), and Support Entrepreneurship rated mature which is above the average value of the group.

Based on the recapitulation at the micro-level group, the average value of this level was 2.78 which is the overall highest level group. Determinant considered below average innovation capacity in the livestock industry is the Basic Research Institute, Applied Research Institute, and Large Industries. There is determinant that has a value equal to the average value of the micro-level group that innovators and entrepreneurs. Determinants above average is the University, Private Investors, and Small and Medium Enterprises (SMEs).

ANIS study results with 30 respondents from businesses, government officials and academics shows that there are a variety of strengths and weaknesses Regional Innovation Systems for the livestock industry of West Sumatra were evaluated from three levels, namely the level of macro, meso and mikro.Based on ANIS method, strength Regional Innovation Systems for the livestock industry found in West Sumatra these levels:

a. Macro Level Innovation Policy, namely the Master Plan, Training and Foresight R and D Agenda.
b. Messo level namely Innovation Technology Transfer Center, Institute of Business Promotion, Innovation Service Providers, and the Institute for Innovation Funding
c. Meso-level Innovation Program is Applied Research Program, Assistance Efforts Science, Technology and Innovation (STI), and Enterprise Support
d. Micro level which shows have the capacity of innovation that includes the University, Private Investors, and Small and Medium Enterprises (SMEs)

Regional Innovation Systems weakness for the livestock industry of West Sumatra are at these levels:

a. Macro Level Innovation Policy is the National Policy, Regional Innovation Policies, Policy and Regulatory Pro Cluster Innovation
b. Level Meso institutional namely Innovation Technopark, Incubator, and Cluster in the livestock industry
c. Level Meso Innovation Program Funding Scheme namely Science, Technology and Innovation (STI), Basic Research Program, the Joint Funding Scheme, Cluster Development Program, and the International Facilitation
d. Level Micro Innovation Capacity Research Institute which includes Basic, Applied Research Institute, and Large Industries.

4.Conclusion

The results showed that the average value of the innovation system maturity level livestock in West Sumatera was 2.61 with an average value At the macro level of 2.61 such as policy, for institutional meso level of 2.51, the meso level of 2.55 and the value to the micro level of 2.78 also as the highest value. It is mean that the maturity level of the innovation system livestock in West Sumatera still at

the developing position (1.5 - 3) has still not been established yet (3-4). Determinants Reginal Innovation System based ANIS immature in West Sumatra and need to be prioritized to be empowered is the implementation of the National Policy, Regional Innovation Policies, Policy and Regulatory Pro Innovation Cluster (macro level), the implementation of Technopark, Incubator, and Cluster (meso-level institutional innovations), and the implementation of the Scheme Funding of Science, Technology and Innovation (STI), Basic Research Program, the Joint Funding Scheme, Cluster Development Program, and the International Facilitation (at the meso level innovation program), as well as the Basic Research Institute, Institute for Applied Research and Industrial Large (at the micro level of innovation capacity).

Based on the conclusions above, intervention needs to be submitted recommendations to the Central Government and Local Government to increase the maturity of determinants Regional Innovation System supporting the livestock industry in west Sumatera must be prepared few determinant for determining priorities which are enhanced where effort is not too big but the effect it is large enough to maturity Regional Innovation Systemfor livestock industri inWest Sumatra.

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