Prospect of the Establishment of Research and Development Institutions in East Kalimantan Province-Indonesia

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Abstract

Referring to the Regulation of the Minister of Home Affairs No. 20 Year 2011, this study aims to investigate the readiness of local government in East Kalimantan Province in forming Research and Development (R & D) institution, as well as to determine the driving and inhibiting factors in developing R & D institution as a regional working unit (SKPD). This research uses descriptive method with qualitative approach. Based on the result, it is concluded that the regions that are relatively better prepared and will have to form R & D institution in the short term are Samarinda City, Balikpapan City, Berau Regency and Penajam Paser Utara Regency, while Bontang City, Paser Regency and Kutai Barat Regency should form R & D institution in the the medium-long term. The main driving factors in forming the R & D institutions are the availability of budget, whereas the inhibiting factors are human resources, products, publications and technology.

Keywords: Prospect; Establishing; Research and Development Institution; Readiness

1. Introduction

The phenomenon of Regional Regulation (*Perda*) has been problematic in almost all regions in Indonesia, as stated by Emerson Yuntho, Researcher of Indonesia Corruption Watch (Republika, 2015), that the existence of *Perda's* problem now is massive as found by the studies or evaluations which are made by several ministries on legal products that have been produced.

To improve the quality of regulations and policies, the government in 2011 has issued Law No. 12 on the Establishment of Legislation. Article 56 paragraph (2) mentioned that the draft of Provincial Regulation is accompanied with explanation or description and or academic texts. Subsequently to article 63 it is clearly stated that the provisions concerning the drafting of Provincial Regulation already mentioned in the preceding article shall also apply to the preparation of the Regency / City Regulations. General provisions of Law No. 12 of 2011 explained that the academic manuscript is the text of the results of research or legal assessment and other research results on a problem that can be scientifically accounted for the regulation of the problem in a Draft Law, the Draft of Provincial Regulation, or Draft District Regulations / Municipalities as a solution to the problems and legal needs of the community.

Law 23 Year 2014 on Regional Government, in article 386 is stated that to improve the implementation of local government, local governments can innovate. The mandate of this law must also become an important basis for the birth of R & D institutions in the region, because the reform era requires the region to create breakthroughs that can be used as regional competitiveness. Moreover, low competitiveness is one of the problems that is faced by Indonesia, which according to the National Development Planning Agency (Bappenas) one of the factors causing the low competitiveness of Indonesia is the budget to improve the quality of human resources through research and development (R & D) or research and development (R & D) minimal.

Deputy Minister of Bappenas Lukita Dinarsyah Tuwo (Kontan, 2014) mentions that the budget amount for R & D which is allocated only 0.9% of the State Budget (APBN) every year or only about 0.08% of GDP. If they look in the neighboring countries, they are more willing to spend more money on R & D. Lukita also admitted that the number of researchers in Indonesia quite a lot. Even more than the neighboring countries. However, the ratio of the number of Indonesian researchers is still relatively small. In 2009, the ratio of Indonesian researchers reached 90 people per one million inhabitants. Compare with Singapore which reached 6,173 researchers, Thailand 316 researchers, Malaysia 365 researchers and Vietnam 116 researchers per one million inhabitants.

In addition to the number of researchers who are still low, currently the presence of local R & D institutions in Indonesia also has not received special attention from the government. This is reflected from the still diverse organizations that accommodate R & D institutions, there are already SKPD itself, but there are still part and sub part in a SKPD. This condition also occurs in East Kalimantan Province, where from nine districts / municipalities in East Kalimantan Province, only three districts/ municipalities of R & D institutions are accommodated in their own SKPD (independent institution) or reflected in their SKPD nomenclature.

Tabel 1. Regional Research & Development Institution in East Kalimantan Province

No	Area	Research & Development Institution Nomenclature
1.	Provinsi Kalimantan Timur	Badan Litbang (independent institution)
2.	Kota Samarinda	Badan Litbang dan Diklat (A combination of two institutions that administer two government affairs)
3.	Kabupaten Kutai Kartanegara	Badan Litbang (independent institution)
4.	Kabupaten Kutai Timur	Badan Litbang (independent institution)
5.	Kota Balikpapan	Bidang penelitian (BAPPEDA) (part and sub part in a SKPD)
6.	Kota Bontang	Sub Bidang Penelitian, Pengembangan dan Evaluasi (BAPPEDA) (part and sub part in a SKPD)
7.	Kabupaten Berau	Bidang Penelitian dan Pengembangan (BAPPEDA) (part and sub part in a SKPD)
8.	Kabupaten Penajam Paser Utara	Bidang Penelitian, Pelaporan dan Evaluasi (BAPPEDA) (part and sub part in a SKPD)
9.	Kabupaten Paser	NA
10.	Kabupaten Kutai Barat	Sub Bidang Penelitian dan Kerjasama Pembangunan (BAPPEDA)

Source: Data processed, 2015

In response to this condition, the Provincial Government of East Kalimantan has issued East Kalimantan Governor Regulation No. 7 of 2012 on the Implementation of Research and Development of East Kalimantan Provincial Government, in which it mandates for the Regency / City government to immediately establish the Research and Development Agency (R & (SKPD) at least two years after the enactment of this regulation. The rules concerning the establishment of the Agency R & D departed from the Minister of Home Affairs Regulation No. 20 of 2011 on Guidelines for Research and Development in the Ministry of Interior and Local Government.

Departing from the above conditions, this study was conducted to see the readiness of regencies / cities in establishing R & D institutions as well as to know the factors that become the impetus and obstacles for districts / cities in establishing R & D institutions as SKPD.

R & D organizations have unique characteristics and tend to be said to have distinctive characteristics (B. Triyono and P.B Putera in Putera, 2013). The uniqueness according to Kersanah (Putera, 2013) can be seen because: its activities more related to idea and knowledge than physical; the volume of work leads to new things; The need for trained professionals; As well as time constraints and innovative nature of risk taking. Kersanah also explained that the main task of R & D organization implemented by a group of professionals who have the ability in terms of research or known as researchers.

According to Suh, Sohn and Kwak (Helmi, 2012: 10) the characteristics of R & D organizations can be explained through value (values), tasks and human resource perspective. First, the value of the most fundamental research organization is to encourage creativity and produce a wide range of knowledge. Thus, the management of knowledge within the research organization should focus not only on knowledge creation but also the development of knowledge to acquire new products and innovation. Second, the task characteristics of R & D organizations are usually project-based. R & D projects are highly oriented and in desperate need of high creativity, highly associated with uncertainty. Therefore, knowledge management systems must remain flexible and autonomic. Third, specifically for R & D organizations in the technology industry, it usually employs talented and highly educated human resources, mostly from engineering and science backgrounds.

The dimensions in improving organizational capacity building according to Keban (2001) in Putra and Iskandar (2013: 179) consist of: 1) human resource development; 2) strengthening the organization; and 3) institutional reform. Another dimension also presented by A. Fiszbein in Son and Iskandar (2013: 179) exists, namely: 1) the ability of labor; 2) technological capability embodied in the form of organization or institution; and 3) "capital" capability embodied in the form of infrastructure resource support.

Furthermore, Lakitan (2012) mentions that there are three very basic capacities that each R & D institution needs to possess, namely: (1) capacity to absorb science and technology from sourcing capacity; (2) capacity for research and development of science and technology (R & D capacity) and; (3) the capacity to disseminate disseminating knowledge and technology.

The "sourcing" capacity of R & D institutions is indicated among others from accessibility to various science and technology information sources, no overlapping of research conducted with research conducted elsewhere, and efficient use of resources in generating useful science and technology. R & D capacity is reflected by the quality of research and science and technology generated, the relevance of technology generated to the real needs of users, and the productivity of technology produced by institutions per unit of resources and / or managed costs. While the dissemination capacity can be seen from the intensity and extent of the publication of the research activities undertaken and the science and technology which are produced both through print and electronic media, the quantity and quality of science and technology which are adopted by the user, and the

royalties which are received by the institution for its technological products successfully communicated.
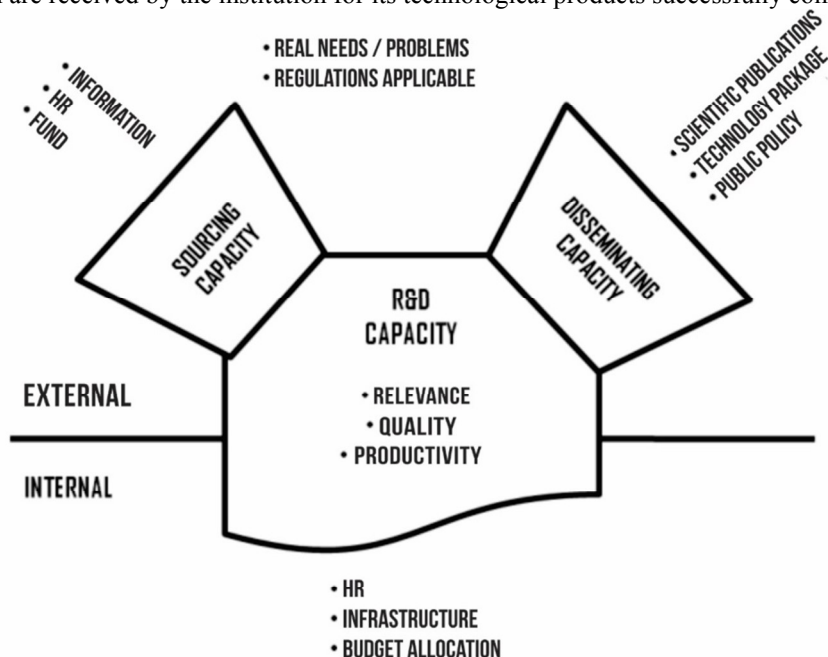

Figure 1. Orientation Diagram and Institutional Research & Development Capacity (*Source: Lakitan 2012)*

Sadu Wasistiono (2010) mentioned that there are several factors that make R & D institutions and local government do not develop, there are: (1) The use of obsolete government management, that is management based on leadership, not on system and competence; (2) Lack of leadership of the K / L and local government in the science-based decision-making process, as it relies more on common sense decision-making, intuition, and past experience; (3) Form of organization of R & D institutions that are structural, so the process of decision making is hierarchical tiered, it is not based on the truth of scientific study; (4) Limited competent professional personnel to handle certain areas of study due to unfeasible organizational forms; And (5) lack of budgetary support, so that the R & D results do not adequately color the decision-making process at the national and regional levels.

Furthermore, the Center for the Implementation of Policies on Promoting Equity and Growth (Fernanda, 2012), has undertaken research in the territories of Asian, African, Latin American and Eastern European countries. It is aimed to identify the success of R & D institutions and to study how the advantages and their shortcomings in managing the performance of research which is published by public policy of the government. Conceptually there are two variables that influence the management of R & D institutions that are endogenous factors (internal organization) and exogenous factors (external organization).

Endogenous factors in general include the following variables: (1) Leadership and management that includes management, institutional structure, financing, and human resources; (2) Research Process Management which includes among others the process of selecting research topics, research selection, process and characteristics of the policy research itself; And (3) Communication and interaction processes that include communication strategies and instruments, linkages with policymakers and other interested parties. While exogenous factors, among others, include several variables such as: (1) Democratic versus authoritarian regime; (2) academic and media freedom; (3) What economic conditions grow, stagnation, depression and so on; (3) Politically how the political demands of public policy research activities and outcomes; (4) Level of openness to the participation of the community or stakeholders; And (4) The degree of quality and capacity of government.

If previous studies are research that is dominated on how the strategy and the drawbacks and advantages of R&D institutions in managing research, then this research is more focused on the establishment of regional R & D institutions independently. This paper will provide a selection of strategies that can be applied by the region in establishing R & D institutions, by showing the advantages and disadvantages that they will get in applying the strategy to be taken.

2. Research Method
Research on the prospect of establishment of R & D institution was conducted during the period of May to August 2015 with research locus was conducted at local government in East Kalimantan Province which has not established R & D institution in independent SKPD that is Samarinda City, Balikpapan City, Bontang City, Berau Regency, North Penajam Paser Regency, Paser District, and Kabupaten Kutai Barat.

This research uses descriptive method with qualitative approach. With the use of this method is expected all the constraints and readiness of each region in establishing R & D institutions can be identified and described comprehensively. Thus, applicable steps can be recommended to the local government to establish an R & D institution into an independent SKPD.

This research also tries to adopt Regulatory Impact Analysis (RIA) method, which is a process of systematic analysis and communicating of policy, both new policy and existing policy (Bappenas, 2011: 3). Another definition explains that the Regulatory Impact Analysis (RIA) is a fundamental tool to help governments to assess the impact of regulation (OECD, 2008 in Ridwan and Krisnadi, 2011: 6)

The objective of the RIA is to provide in detail and systematically assess the potential impact of the regulation as well as to assess whether the regulatory possibilities achieve the desired objectives. RIA is simply used to ensure that the rules will improve the welfare of the community from the point of view - that is, that profits will exceed costs (Ridwan and Krisnadi, 2011: 4).

In this study, data collection is done in two ways: first, by interviewing (in-depth interview) to some key informants, such as: Regional Secretary, Assistant, Head of Local Government Institution, Head of Regional Planning Institution, DPRD (Regional People's Representative Assembly) and University's R and D. Secondly, by conducting a closed interview through distribution of questionnaires to all Heads of Offices and Bodies at each locus. While the secondary data is data that already exist namely, organizational structure (where R & D institutions are located), RPJMD (local medium-term development plan), lokus statistics, and academic manuscripts about the formation of government organizations.

3. Results and Discussion
3.1 Description of Research & Development Institutions in the Research Location
Formulation of vision and mission as well as elaboration of RPJMD of local government in seven research location concretely has accommodated the importance of implementation of affairs of development in encouraging regional development. Nevertheless, support from institutional, human resources, policy regulation, as well as the implementation of its tasks still require considerable attention. Institutional arrangement must necessarily be directed to restructure the authority structure, duties, functions, main activities of the organization, as well as pay attention to working relationships and coordination relationships among agencies, agencies, institutions and other government agencies in the region. The boundaries of authority and clear working relationships will lead to more effective and efficient regional performance of course (Wismono, et al, 2015: 366).

In general, R and D affairs within Bontang City Government, Balikpapan City, Berau District, West Kutai District, North Penajam Paser District and Paser Regency are attached to SKPD Bappeda (become part or sub part of an institution structure), whereas Kota Samarinda is attached to SKPD Badan Litbang dan Diklat (BLDD). In its institutional structure, the affairs of research and development that are at the level of echelon IV are in Bontang City, Kutai Barat District, and Paser Regency. The affairs of research and development of echelon III are in Balikpapan, Berau, Samarinda and Penajam Paser Utara. The attachment of R and D affairs to the Bappeda agency is due to the assumption that the affairs of the research and development can support the regional development planning.

From the description of R & D institutions in the seven-research location, the data obtained such as the condition of human resources R & D institutions, budgets of development, R & D facilities and infrastructure, regulations / policies that support the existence of R & D units, and publications and activities carried out. The data are then synchronized with the interview transcript (in-depth interview) with the selected respondent and the result of the dissemination of the entire SKPD questionnaire, for further analysis using RIA and Lakitan concepts (2012).

The process of analyzing the data is preceded by mapping the problem of R & D formation of each locus, analysis of perceptions of SKPD, analysis of alternative actions and the benefits and losses of R & D establishment, analysis of supporting factors for establishment of R & D institutions, to further develop the required implementation strategies related to institutional R & D in the regional area.

3.2 The Problem of Establishing Research & Development Institutions
As mandated by the East Kalimantan Governor Regulation No. 7 of 2012 on the Implementation of Research and Development of the East Kalimantan Provincial Government, the Regency / Municipal Government shall immediately establish a Research and Development Agency (R & D) as a regional work unit (SKPD) no later than two years after its promulgation This regulation, up until now there are still five cities / districts that R & D affairs still in part of work units Echelon III / IV in Bappeda and the city of Samarinda which R & D affairs merged with regional training.

From the data collected in each locus, it is known that there are some problems that cause why up to now the area has not yet established R & D institution independently. The discussion of this issue will be related to

what is delivered by Lakitan (2012), about the three basic capacities that each R & D institution needs to possess, as follows:

a. *Sourcing capacity*

The limitations of human resources both from quantity and quality is a problem that is owned by all regions that become the locus of study. Most regions argue that let alone have a functional researcher, currently the general functionalities in the R & D unit are perceived to be lacking. Though it should produce an applicable and useful research needed human resources who really understand and able to do research and development. Manahot (2016: 26) in his study emphasized that all R & D institutions stated that HR is the strength of institutions in conducting research and development, then lab facilities, work environment / bureaucracy, literature and final budget. The absence of functional researchers in the region is also due to the low interest of employees to switch to functional researcher. This is reflected in the answer SKPD in the region, where more than 80 percent answered the interest of employees to be the researchers are still low.

Furthermore, one of the factors causing the functional researcher into positions that have not ogled by employees in the region, because there is no additional Income Employees (TPP) is given specifically to the functional researcher. In fact, if it is oriented to the Kutai Kartanegara Regency which already has an independent R & D institution, the local government gives TPP for functional researcher whose scale is almost equal to the structural official, and this succeeds in attracting the employee to switch to functional researcher.

Another problem related to sourcing capacity is that most regions do not yet have a network of foreskin. Whereas for the activities of development, a network is needed, especially in terms of data collection and dissemination. Ideal networking conditions can accelerate innovation by increasing the effectiveness and efficiency of research absorption and improving the implementation and usefulness of research results to users of science and technology (Handayani, 2012: 44; Perwitasari and Sutrisnanto 2015: 35)

b. *Research and Development capacity*

The lack of quality and quantity of human resources researchers owned by the region, causing the region chose to submit the R & D affairs to third parties, covering the involvement of universities, government or private. Even in the district of Berau, they have routinely annually auctioned R & D activities. This clearly makes the capacity of R & D institutions to be less developed, because they do not substantially understand the activities undertaken. This is like the results of Agus and Amalia's research (2013: 29) which states that related to the substance of development, regional apparatus is relatively unfamiliar with what the role and output of the unit of development.

Furthermore, from the results of the study known, that innovations undertaken by the region has not been born from R & D activities. Whereas the existence of R & D units is expected to create new breakthroughs, which accelerate the implementation of regional development and improve the quality of public services.

If both preceding reasons are internal problems within the local government, then there are two external reasons related to R & D capacity. Firstly, there is no policy that is "forced" the region to immediately establish R & D institutions in SKPD independently. Home Affairs Minister Regulation Number 20 Year 2011 on Guidelines for Research and Development within the Ministry of Home Affairs and Local Government only states that local governments establish research and development bodies as units of regional apparatus no later than two years after this regulation applies. But no mention of punishment that will be given by the region, so there is no coercion for the region to form R & D institutions independently.

Secondly, there is no clarity regarding to the establishment of R & D institutions as a regional apparatus organization. This is related to the issuance of revision of Government Regulation No. 41 Year 2007 on Organization of Regional Offcial Institution, while the current area has been mostly using the maximum pattern, so to form R & D institution in its independent SKPD has not been possible.

c. *Disseminating Capacity*

The capacity of an R & D institution is clearly visible from the benefits of R & D results. From most of the research location, they have not publicized their R & D results. The process of dissemination cannot be eliminated in R & D activities, because at this stage the results of R & D will be promoted, so that it can be conveyed to the parties who want to utilize the results of R & D. It is necessary to increase the productivity of R & D institutions on improving publications, increasing seminars, and improving research results that can be exploited by various parties (Sutrisno, 2012: 9). In addition, the problem that occurs in the most research locus related to disseminating capacity is that R & D activities that have been done have not been fully utilized as policy making materials.

3.3 Perception of SKPD

In addition to conduct interviews with key informants, researchers also distribute questionnaires to all SKPD's director in the local government that become the research locus. This activity is conducted to get the perception of SKPD in the region related to the establishment of R & D institution independently.

In general, of the seven points being questioned, in principle all SKPD in the region support the

establishment of R & D institutions independently. They argue that in the short term (1-2 years), R & D institutions need to be established. In fact, according to them the head of each locus area is very supportive if the future results of R & D activities will be used as material stability decision. Besides from the answers SKPD, also known that in principle SKPD does not mind if later R & D affairs will be conducted in "one door policy".

Furthermore, from the list of questions almost most of the SKPD states that the implementation of local government policies has been based on R and D. This condition is clearly in contrast to the findings in the field, where from several interviews with key informant in the region mentioned that the results of many R & D activities that have not been utilized, even innovations undertaken by the region have not been born from R & D activities.

The condition that is guaranteed by SKPD is the interest of employees to be researcher which is still very low, this is evidenced by the absence of researchers owned by the local government that become the research locus. Whereas areas such as Kota Balikpapan and Samarinda have opened opportunities for employees who want to become researchers. Then, SKPD also justify if later R & D institutions will be formed independently, then the regional budget is sufficient to support it.

3.4 Alternative Measures and Benefits and Losses Establishment of Research & Development Institutions
Departing from the problems that are faced by local governments in the establishment of R & D institutions above, then it can be formed two alternatives that can be selected by the Regional Government. Two alternative actions can be selected by the local government based on the readiness and capacity of the region to implement the option. Nevertheless, the research team will recommend the best possible alternative that is relatively feasible and relevant to be implemented by the local government to establish regional R & D institutions.

a. Acceleration option/ instant action in the short term
This alternative action is a quick implementation of the regulatory impulse that exists, both *Permendagri (minister of home affairs' regulation)* and *Pergub (province head's regulation)* mandated that local governments immediately form R & D units independently. However, this option of action is relatively less attention to or evaluate the readiness and capacity of local governments.

Accelerating the establishment of R & D institutions recognized as a risky option for local governments, since the existence of new institutions will necessarily require considerable financing and personnel. In addition, if R & D institutions have not been able to exist or provide substantial and meaningful benefits for regional development, improving public services, and organizational performance, it is certain that the conditions that occur are waste and ineffective of an institution.

For local government, the choice of acceleration action (instant action) will give positive side (benefit) and negative (loss). Broadly speaking the negative side that may be faced by the region if choosing instant action is the same that are: requires personnel, budget and supporting facilities and adequate infrastructure; The implementation of R & D tasks will still relatively less optimal and likely will still utilize the cooperation of third parties; As well as implementing R & D activities are relatively non-functional researchers, so that the competence and implementation of R & D will not be in accordance with R & D standards.

As for the positive side that will be faced by the region in applying instant action is also relatively the same, namely: the implementation of affairs will be more focused; Volume and agenda of R & D activities will be quite a lot; Employee interest to switch into functional researcher will emerge; And new structural positions are available for employee career development. However, this instant action model will bring more benefits for Balikpapan, Samarinda, Berau and Penajam Paser Utara. The formation of R & D institutions soon will realize the mission of Balikpapan City and Berau regency related to the development. Furthermore, for Samarinda, instant action will strengthen the war of R & D institutions in coordinating the affairs of foresight, whereas in North Penajam Paser District, the acceleration of R & D institution will be aligned with the national program "Science Park".

b. The structured planning option (organized action) in the medium to long term
This alternative action evaluates the ability and readiness of the region to then adjust the time of R & D institutional establishment gradually. This action option encourages local governments to prepare infrastructure supporting R & D institutions (sourcing capacity) to then step into R & D capacity building and optimize the benefits of R & D results. Institutional R & D as an organization that is reforming and repositioning its institute, can also implement balanced scorecard by referring to the concept of balance between various points of view such as, short and long term, attention span (internal and external) external and internal performance measurement, performance measurement Past (financial) and measurements that encourage future performance (non-financial), objectivity elements (measurements of quantitative results) with elements of subjectivity (measurement of performance triggers that require consideration / qualitative), and short-term goals and long-term goals (Narutomo , 2012: 194).

The alternative of structured (organized action) action planning is classified as medium to long term choice because it begins in the process of adequate preparation that is preparing human resources who are competent

enough to carry out the duties of development, preparing the budget as well as facilities and infrastructure supporting R & D tasks, also designing Basic tasks and R & D functions accurately.

For local government, the choice of structured (organized action) planning action will give positive side (benefit) and negative (loss). For the positive side, all regions will be given benefit equally if implementing organized action, namely: the establishment of independent R & D will be formed with careful preparation; Facilities and infrastructure can be prepared; As well as R & D duties have been designed accurately. While the losses that are going to be gained by all regions if R & D institutions are established in the medium or long term are: the time for R & D to be established is long enough; Employee interest to be functional researcher remains low; As well as the volume of R & D activities will still be quite limited until the formation of independent R & D. If the instant actions of Balikpapan, Samarinda, Berau and Penajam Paser North have more benefits, on the contrary by applying organized actions they experience more losses when compared to other areas. This condition is related to the achievement of related missions in Balikpapan and Berau; strengthening the role of libang in Samarinda in coordinating R & D activities; As well as the implementation of the 'Science Park' national program in North Penajam Paser.

3.5 Factors that Support the Establishment of R & D Institutions
There are nine elements that affect the capacity of R & D institutions that are mentioned by Lakitan (2012), which is divided into three capacities. From these nine elements will be seen whether the focus has been a driving factor for the establishment of R & D institutions in the region. From the findings in the field it is known that the driving factor that is owned by all regions is the budget. This is evident from the size of the research budget that is held by the region and the trend is always up each year, and this happens in most of the research loci. In addition to the findings in the field, the availability of this budget is also reflected in the SKPD statement in the regions, that the regional budget is sufficient to support the existence of R & D institutions.

The second element that being the supporting factor that many areas have is information, namely accessibility to various sources of information. The city of Balikpapan and the city of Samarinda have these elements, since these two areas have relatively often cooperated with local and national universities, government as well as private, so that data collection is easier. As for the Berau District currently has information about the potential for the development, which comes from universities.

The areas that have the most supporting factors are the city of Balikpapan, Samarinda and Berau, as many as four drivers. From the results of interviews with key informant note that some of the results of R & D activities that have been done quite applicable and usually directly incorporated into action plans related to SKPD activities or as the next policy making materials.

Furthermore, the factors driving the formation of R & D institutions owned by the three regions is the policy. For the City of Balikpapan, policies related to R & D activities are contained in the RPJMD, besides Balikpapan through BKD has opened opportunities for employees who want to switch to functional researcher. Furthermore, Bappeda Kota Samarinda has issued a policy that as of 2016 research and development activities can no longer be done by SKPD other than BLDD of Samarinda City, and if there SKPD within Samarinda City Government proposing research activities will be coordinated to BLDD of Samarinda City. However, policies that have been done by the Government of Berau District is applied since 2013 R & D units consistently conduct R & D activities, at least two activities each year.

3.6 Implementation Strategy
From the problems, as well as alternative actions related to the establishment of R & D institutions above, then prepared some strategies that can be done region is needed. The strategy in question is as follows:
a. Socialization, this effort is done to introduce to the urgency of R & D institutions. In addition, with the socialization, it is expected that local government can build a network of development. The implementation strategy of socialization is divided into two, namely:
    1) Internal socialization
        In this strategy, the role of the provincial government is enormous, in which the provincial government is expected to disseminate the urgency of R & D institutions and its formation in the regions, and to provide guidance on the establishment of regional R & D institutions (eg establishing a provincial R and D network, involving regions in R & D activities). Furthermore, to further introduce R & D activities the provincial government can do resource sharing with the district / city government
    2) External socialization
        In this strategy, local governments are expected to further intensify R & D activities in the regions, by encouraging local universities, or NGOs to be actively involved in R & D activities in the region, as well as being part of R & D networks in the region.
b. *Capacity Building,* is an effort that must be done so that both existing and future R & D institutions can be a think tank organization, which can make a real contribution to regional development. The implementation

strategy of capacity building is divided into three, namely:

1) *Resource capacity*

In this strategy, local governments are expected to begin preparing functional researchers, either through general acceptance or by conducting socialization for employees who are willing to switch to functional researcher. Furthermore, local governments have also started budgeting for the development of employees who are involved in activities of research, and TPP enough for researchers. This is of course expected to be a stimulus for employees who are interested in becoming a researcher.

2) *R &D Capacity*

To improve the capacity of R & D, local government can cooperate with local and national universities, in the form of apprenticeship program for R & D human resources. Thus, the employees who are in the R & D unit in the future can conduct R & D affairs independently.

Furthermore, for R & D activities to produce output relevant to the needs of the region, local governments should do mapping or analysis needs or R & D agenda. Surminah (2013: 101) in his research explains that one of the problems that is faced by R & D institutions in implementing R & D results with users (Industry / SME / Community) is the lack of linkage of R & D institutions themselves as producers of technology and as technology users.

3) *Diseminating Capacity*

For R & D results to be utilized properly, it is necessary to disseminate R & D results. This can be done by reproducing and disseminating the publication of the results of the study, as well as utilizing IT in disseminating innovation and R & D results. Local governments can also encourage the implementation of applied research and implementation studies to encourage the birth of regional innovation.

c. Reward and Punishment, is an effort that can be done by the provincial government so that R & D institutions in the districts / cities can be independently accommodated and R & D activities become the focus, that is by encouraging the enforcement of regional regulations that "force" the region to establish R & D institutions. This is related to the absence of regulation from the center that explicitly obliges regions to form R & D institutions independently. Then, in addition to punishment, the provincial government can also provide IPTEK AWARD rewards to local governments that give birth to innovations through R & D units.

4. Conclusion

Based on the findings of the field, it can be concluded that the area that is relatively readier and must form R & D institutions in the short term is the City of Samarinda, Balikpapan City, Berau Regency and North Penajam Paser Regency. This is because the four regions have more support factors when compared with other regions. In terms of policy, their regions already have special attention to R & D affairs, then some results of their R & D activities also exist that are utilized and relevant to regional planning. Then that is not less important is they already have information that supports R & D activities, such as in Berau District that already has information related to research potential.

While for the North Penajam Paser District, although the supporting factors are not as many as other areas as the short-term category, the central government policy that makes the North Penajam Paser District is included in the National Park Science Program, makes the R & D institution necessary and matching the national program.

Furthermore, for Bontang City, Kabupaten Paser and Kabupaten Kutai Barat can establish R & D institutions in the medium to long term. It is also still attributed from the lack of supporting factors owned by the area. Although from the SKPD statement it is known that the head of the region strongly supports the establishment of R & D institutions, but in fact the areas that enter in the medium-long term does not have a policy that makes R & D institutions become urgent to be formed.

The most driving factor of the region in establishing R & D institutions is the budget. It is seen that the regional budget for R & D activities has a positive trend, it is also evidenced from the SKPD statement in the regions, that the regional budget is sufficient to support the existence of R & D institutions. The second factor is central and local government policy. With the policy of the government that strengthen the function of R & D institutions can certainly accelerate the formation of R & D institutions.

While the most inhibiting factors in the field are human resources, products, publications and technology. R & D units in the region do not have the means of R & D publications, so the dissemination of R & D products has not been maximized, besides the regions also have not used IT in the process of dissemination of R & D results. Furthermore, the third inhibiting factor is the product, where this factor is related to the absence of local innovation that was born from the results of R & D activities.

Some important steps that can be done related to the establishment of R & D institutions include the Provincial Government needs to disseminate and disseminate to the local government about the urgency of R & D institutions to equate R & D related perspectives. Another consideration to consider is to utilize the Provincial Balitbangda that is relatively sufficient to have the functional human resources of the researcher to conduct

research in collaboration with the technical SKPD in the region, or by working with local government R & D units. Balitbangda Province simply request input to local R & D unit or SKPD technical area related to study which need to be done and then can-do sharing budget of study implementation in area. If this is applicable, the role of East Kalimantan Province Balitbangda will also be optimal in supporting the performance of local government in East Kalimantan Province.

Furthermore, local governments also should start to strengthen R & D function especially through the functional recruitment of researchers, both from general acceptance and open opportunities for employees who want to change positions. Budget preparation related to employee development and incentives for the functional researcher should also be initiated, so employee's interest to choose functional position can also increase. In addition, local governments are also expected to create policies that can strengthen R & D functions, such as the proposed strategic program of SKPD that should be based on technical studies conducted by R & D institutions. Finally, is the R & D unit in the future need to involve technical SKPD related to the scope of the study conducted so that the results and the results of the study can be used. Because, if it is done by the R & D unit itself tend to less than the results can be utilized by the relevant technical SKPD. Third-party engagement in R & D activities can be gradually reduced by involving technical SKPD as part of the work team of R & D activities undertaken.

Acknowledgement

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