

DEVELOPMENT OF THE SUSTAINABLE INNOVATION ECOSYSTEM AREA IN INDONESIA AND IT'S OBSTACLES

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ARTICLE INFO

Received: (21/3/2021)

Received in revised:
(31/3/2021)

Accepted: (15/4/2021)

Published: (7/6/2021)

Open Access

ABSTRACT

Recently, several regions in Indonesia have been active in developing sustainable innovation ecosystem areas. This is inseparable from the birth of several policies that encourage it. However, there are still many obstacles to be found. Commitment from stakeholders, determination of focus areas to be developed, management human resources who focus on area management, availability of early adopters greatly affect the sustainability of the area. Several lessons learned and breakthroughs in area management in ensuring sustainability are discussed in this paper. From several keywords for success, stakeholder commitment is the main key to the success of the sustainable innovation ecosystem area.

Keywords: innovation ecosystem, start-up, breakthrough, early adopter, commitment

1. Introduction

The world today is faced with a global economic shift. In the past, the world community developed an industry-based economy. Now the system has shifted to a knowledge-based economy. Previously, production factors were limited to natural resources, labor, technology and capital. Now there are additional factors that can boost a country's economy, namely the information and knowledge factor.

Information and knowledge are additional factors that play an important role today. Without adequate information and knowledge, it is impossible for a country to become a developed country. Thus, a society that supports a knowledge-based economic system must be an information literate society with a strong knowledge base. One of the characteristics of this society is having a high interest in science and technology. Without this kind of society, the idea of a knowledge-based economic system seems far off. This is because human being the driving force of the economy.

The challenge faced by academia or the campus world in Indonesia today is to answer a question: Can research from academia answer the needs of the industry? Experience proves that it still takes several steps to apply laboratory scale research (academics) to an industrial scale. The fact also states that a facility is needed that can bridge technology development research, technology and business incubators, business

mediators, to the industry. Where each institution, both universities, R & D institutions, incubators and so on, has a different role strengthening. This facility is known as the Sustainable Innovation Ecosystem Area (SIEA). The SIEA in Indonesia can be in the form of Science & Technology Park (STP) or other names but has the same role, namely encouraging research development into innovation, growing and developing technology-based start-up companies or entrepreneurs and developing industrial clusters. The existence of SIEA is of course very necessary in synergizing innovation actors, at least consisting of academics, government and industry. The elements of academia, government and industry are important factors in carrying out this role.

This paper consists of four main sections. The first section deals with policy support. The second part contains a case study for the construction of Bandung Techno Park. The third part describes breakthroughs and learning. The fourth section contains discussion and conclusions.

2. Policy Support

The government has issued various policies related to industrial growth in various sectors, accelerated economic growth in the regions, to the development of several centers of excellence in various fields and regions. Several government

policies and programs in developing domestic industry, human resources (HR) and innovation in order to increase productivity and competitiveness can be stated as follows:

- (1). The direction of economic development in 2025, which is stated in the National Long-Term Development Plan (RPJPN) 2005-2025 [Law No. 17/2007]. In order to develop Indonesia into a country of quality and competitiveness, a development strategy was drawn up for a span of 20 years, from 2005 to 2025. This development strategy is known as the RPJPN. The RPJPN is divided into four phases, each of which takes five years. The years 2015-2020 are in Phase 3 of the National Medium-Term Development Plan (RPJMN), which is to consolidate development as a whole in various fields. In the two previous stages of the RPJMN, namely stages 1 and 2, the concentration was on restructuring Indonesia and strengthening this arrangement is hoped that in RPJMN 4, which take place in 2020-2025, Indonesia has succeeded in creating an independent, advanced, just and prosperous society.
- (2). Policies that promote inclusive and sustainable high economic growth to transform Indonesia into a developed country and as the world's top twelve (2025) and the world's top eight (2045) powers are embodied in the RPJPN 2005-2025 [Law No. 17/2007].
- (3). Build a National Industry, where the Government determines the Agro industry, telematics industry and the transport industry as a future industry and as a pillar of the national economy [Presidential Regulation No. 28/2018].
- (4). Policy to develop a regional science and technology park (STP) is one of the programs listed in the nine development priority agendas which are often referred to as the Nawa Cita. This has led to the birth of several STPs in Indonesia [Presidential Regulation. No. 2/2015].
- (5). The Ministry of Industry's program, especially in the field of Information Technology and Telecommunications, where in developing the telematics industry, the Ministry of Industry has programs, targets and strategies for developing the telematics industry. This development is divided into three stages, namely stage I (2011-2015 period), stage II (2016-2020 period), and stage III (period 2021-2025). The strategy is divided into four parts. First, harmonize government policies and programs. Second, expanding domestic market access as a basis for development. Third, develop the telematics industry in potential areas. And finally, strengthening the competitiveness of the national telematics industry. The program is contained in [Regulation of the Minister of Industry No. 128/2009], [Regulation of the Minister of Industry No. 129/2009], [Regulation of the Minister of Industry No. 129/2009].
- (6). Increasing the competitiveness and independence of the nation through strengthening science and technology [Law No. 18/2002].

- (7). Several regulations were created to encourage the development of STP and of course in order to encourage the growth of innovation [Presidential Regulation (PR) No. 106/2017], [Regulation of Minister of Research, Technology and Higher Education (MoRTHE) No. 13/2019], [Regulation of Minister of Research, Technology and Higher Education (MoRTHE) No. 25/2019]. Meanwhile, the government's encouragement to universities in utilizing research results, increasing the capacity and capability of managing the innovation process and increasing the productivity of innovation is manifested in [Regulation of Minister of Research, Technology and Higher Education (MoRTHE) No. 24/2019].
- (8). The policy on the National System of Science and Technology, embodied in [Law No. 11/2019].

3. Case Study

To provide an overview relevant to the topic of the paper, a case study on the growth of the SIEA Bandung Techno Park (BTP) was taken.

Preparation Phase

This paper discusses how to create, grow and develop Bandung Techno Park (BTP) as an example of a Sustainable Innovation Ecosystem Area (SIEA) in Indonesia. The seven stages involved in giving birth to BTP are as shown in Figure 1.

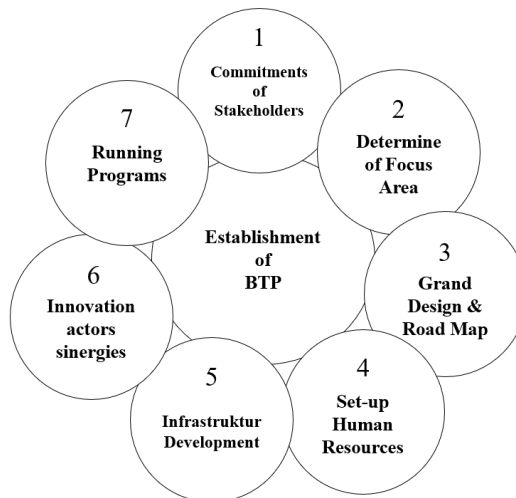


Figure 1. Seven Stages to build SIEA-BTP

BTP was initiated by the Telkom Institute of Technology, a tertiary institution belonging to the Telkom Foundation (TF) or Yayasan Pendidikan Telkom in 2007. This initiation was initiated by the commitment of TF and the leadership of the Telkom Institute of Technology (ITT) to build SIEA. Apart from ITT and TF, Telkom Indonesia and the central government such as the Ministry of Industry, Ministry of Research and Technology, Bappenas and the Provincial Government of West Java have also shown their commitment to encourage the birth of the SIEA. Commitment from stakeholders is absolutely necessary in building SIEA. The manifestation of commitment

from stakeholders is certainly different according to their fields. The academic element, in this case the campus under TF, is committed to developing research results towards innovation. The government is committed to providing grants in the form of infrastructure development grants, and this is stated in the RAPBN and RAPBD. Meanwhile, the industry or company has a commitment to take advantage of the innovations developed by SIEA, at least as an early adopter of products developed by SIEA. Many SIEA developments have stopped in the middle of the road because there is no strong commitment from stakeholders.

BTP was built with a passion to encourage the realization of a higher education institution under TF to become a Global Entrepreneurial University (GEU). In order for BTP to be managed in a focused manner, stakeholders agree that the focus areas that BTP will develop are the field of Information and Communication Technology (ICT). And it can be developed into the energy sector if the development of innovation in the ICT sector is deemed ripe. The focus area is very important in a SIEA.

After the focus area is determined (namely the ICT sector), the next stage is the preparation of the grand design of the BTP area and the development blueprint / road map. Furthermore, the human resources who will manage it are prepared, which is taken from the ITT lecturers.

Infrastructure development is clearly needed so that the role and function of the SIEA in general can run properly. The next stage is to develop a network of innovation actors such as academia, government and industry / companies which will be discussed in the sub-chapter of internal strengthening and external strengthening. The final stage in the preparation for the development of the BTP is to carry out the annual BTP program outlined from the roadmap that has been prepared.

BTP was declared a SIEA in early 2010 and as part of the ITT campus. In 2012 BTP was spun off from ITT and as an innovation and development agency for start-up companies, under TF. In 2017, BTP returned as part of the campus (namely Telkom University).

Internal Reinforcements

The internal strengthening referred to in this paper is strengthening within Telkom Indonesia, especially in the TF environment. Because in the organizational hierarchy, BTP and ITT were under TF and TF was formed by Telkom Indonesia. Several internal strengthening programs implemented include:

- (a). There are big goals to be achieved together. As previously mentioned, the background for the establishment of BTP is the existence of a big goal that will be achieved together, namely to prepare Telkom university to become a Global Entrepreneurial University in 2038.
- (b). The ITT campus institutional transformation from Teaching University to Research University. To encourage the growth of innovation in the SIEA environment and in order to encourage the growth and

development of research in the Telkom campus environment, it has been declared that the transformation of the campus from a teaching university to a research university.

- (c).Development of synergy between the university and SIEA. Strengthening the development of synergies continues to be built, including by agreeing on the division of roles in the development of innovation between the university and SIEA. Research development to laboratory scale prototypes is carried out at universities, and then brought to SIEA to be developed into innovation.

External Reinforcements

Telkom Foundation has announced that in the future the campuses under its management will become World Class University (WCU). This is the background of the birth of BTP, because BTP is needed to support the realization of the WCU campus. ITT is one of YPT's campuses with an area of technology that is used as the driving force for the realization of the WCU.

The development of BTP went through several stages, starting from the collaboration between ITT and the Indonesian Ministry of Industry to establish a Telematics Technical Unit (TTU) in the ITT Campus area in 2007. And continued with the establishment of the Telecommunication Design Center (TDC) in 2009, which was also the result of cooperation between ITT and the Indonesian Ministry of Industry. In 2009 a Business Incubator was also established as an implementation of the collaboration between ITT and the Ministry of National Education. The three institutions were merged in early January 2010 as SIEA under the name BTP.

Collaboration with the Ministry of Research and Technology is also fostered, as illustrated by: BTP is actively involved in the national STP development program, BTP has received a number of start-up candidates growth grant and start-ups development grants.

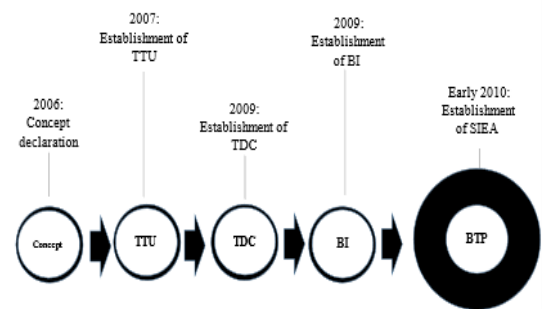


Figure 2. SIEA-BTP milestones

Another external strengthening is that BTP establishes an advisory board consisting of various elements of innovation actors, namely Academics (Telkom University Chancellor), Government (Ministry of Industry and Ministry of Research and Technology), Industry / Companies (Telkom and Telkomsel), Community represented from the Indonesian Science and Technology Park Association/Asosiasi Sains Teknologi Park

Indonesia (ASTPI). Periodically, this advisory board conducts discussions regarding the achievements of BTP and the suggestions and strategies that must be carried out if there are targets that are not achieved.

4. Breakthroughs and Learning

Breakthroughs that have been made

Realizing the SIEA cannot be separated from the breakthroughs made by the management. Several breakthroughs made in the development of BTP as a SIEA in Indonesia include:

- Determine the human resources who will manage SIEA in a focused manner. It is not only the focus areas of the SIEA that must be determined, but the human resources of the management must also focus on managing the SIEA. So that, the SIEA manager does not have concurrent positions at other institutions. Some areas of innovation in Indonesia are difficult to develop because managers do not focus on managing these areas.
- Establishing a maximum of three widely important goals (WIG) as priority programs. WIG that is not too much is intended so that handling and monitoring can be more focused. This WIG matter is reviewed periodically according to the conditions and situations that affect it. At the initial stage, three programs are defined in WIG as shown in Figure 3.
- Looking for partners as early adopters of the developed innovation product. In this case, BTP took the Telkom University campus or the TF group or even the Telkom Group as an early adopter. This is not owned by SIEA elsewhere in Indonesia. This early adopter acted as the first user of the innovative product developed by BTP.
- Establish intensive cooperation with various ministries, especially in obtaining grants such as program grants, funding grants for growing of start-ups, funding grants for start-ups, funding grants for processing Intellectual Property Rights (IP) or patents, laboratory equipment grants, to infrastructure development grants.
- Active in various activities related to innovation development such as seminars, Focus Group Discussions (FGD), industrial gatherings, as a member of relevant associations, is involved in policymaking. This is also an effort to promote BTP on the national and international level.

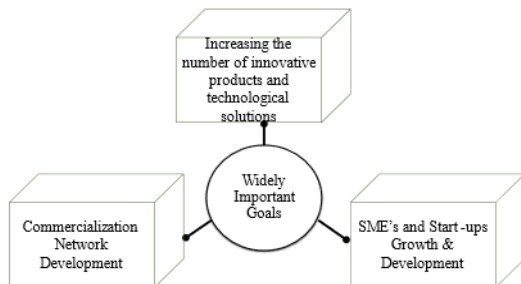


Figure 3. Widely Important Goals.

Real Impacts

With the support of regulations, strengthening and breakthroughs carried out, as well as synergies between innovation actors that are built intensively, Indonesia is able to realize BTP, namely SIEA in the ICT sector as shown in Figure 4. The start-ups in the ICT sector that are grown in the area is shown in Table 1.

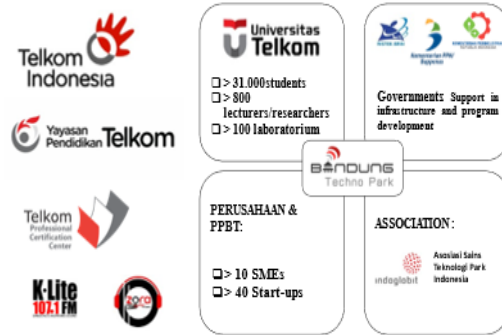


Figure 4. Synergy of Innovation Actors at SIEA-BTP

Table 1. Start-ups established in BTP in the range 2011- 2017 [Dana S.Kusumo, 2019]

Startup's ID	Establishment Year	Main Business Sectors
AGT	2011	Software
APS	2012	Apps
CCX	2012	Electronic Hardware
BMB	2013	Apps
ATM	2013	Apps
IDS	2014	IoT
KMS	2014	Apps
SBK	2014	Apps
ORN	2014	Apps
DNT	2015	Electronic Hardware
FON	2015	Embedded System
GPT	2015	SaaS
IKT	2015	Social Media
MTV	2016	Embedded system
HII	2016	Apps
NNT	2016	Software
MDG	2016	Software
KLV	2016	Apps
MOD	2016	Apps
ARU	2016	Market place
SMS	2016	Apps
ALL	2016	Software
NTR	2016	Electronic Design
YCT	2017	Services
CID	2017	Apps
BTN	2017	Apps
MDT	2017	Apps
DES	2017	IoT
SSC	2017	Social Media
SIS	2017	Embedded System
MIS	2017	Apps
MGO	2017	e-commerce support

5. Discussion

The issuance of regulations related to the development of SIEA in Indonesia in the last 5 years has motivated both universities and local governments to build STP. However, several lessons learned from the growth and development of STP in Indonesia include: (i). There are still many STPs that do not yet have a focus area to be developed, (ii). There are still many STP where the managements have not yet focused on managing STP, usually found in STP under local governments, (iii). There are still many STPs that very often change managements, which often occurs in STP under local governments, (iv). There are still some STP managements who still lack understanding of the role of STP, this usually occurs due to the lack of opportunities for managers to participate in capacity building, (v). There are still many STPs whose institutions are not clear, (vi). There are still many STPs whose organizational structures are still incomplete, so that only part of the roles are carried out, (vii). There is still weak synergy between the innovation actors that are built, this can be seen that there are still some STPs that do not have cooperative ties with universities so that the sources of innovation are still very limited, (viii). There are still many local governments that do not understand the importance of STP so that their commitment is still weak in providing support for STP, (ix). Some managements are still weak in developing STP so that financing the development of STP, both investment and even operation, relies on the central government. This can be seen from several STPs whose development is very slow because no funding is obtained from outside the central government.

6. Conclusion

Several regulations have motivated universities and the government to build SIEA. The regulations that were very dominant in encouraging the birth of the SIEA were: (i). Presidential Regulation No. 106/2017 on Science and Technology Area, (ii). Regulation of the Minister of Research, Technology and Higher Education No. 13 of 2019 concerning the 2015-2030 National Science and Technology Area Development Master Plan, (iii). Regulation of the Minister of Research, Technology and Higher Education No. 25/2019 concerning the Management of the Management of the Science and Technology Area.

Strong stakeholder commitment correlates with the success of the developed STP. This can be seen from the existence of a common goal to be achieved so that all elements understand this one goal and focus on achieving it.

However, there are still many obstacles faced in the management of several STP in Indonesia that have been described in the discussion, so that this hampers the growth of SIEA in Indonesia.

Several important things that need to be underlined include: continuous development of SIEA management capacity, increased synergy and collaboration of innovation actors, preparation of the SIEA road map as a reference

for managers in carrying out their activities, SIEA must be managed in a focused and professional manner and not as a side activity, also required the early adopter.

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