CALL FOR MULTI HELIX INNOVATION COLLABORATION IN CHANGING THE COVID-19 PANDEMIC ENVIRONMENT

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Abstrak

Kerjasama berbagai aktor dalam riset dan inovasi sangat diperlukan dalam menghadapi kondisi pademi COVID-19. Situasi pademi COVID-19 merupakan kondisi perubahan yang ekstrim, suatu bencana yang perlu direspon oleh pemerintah. Respon dilakukan dalam kerangka kerja bentuk kolaborasi. Studi tentang riset teknologi, inovasi serta peran ilmu pengetahuan pada kesuksessan inovasi pada kondisi perubahan lingkungan sangat penting. Riset-riset dilakukan oleh badan riset, pemerintah dan organisasi internasional. Adanya peningkatan pada Responsible Research dan Innovation (RRI) menunjukkan upaya serius untuk menangani tantangan perubahan. Riset yang dilakukan meliputi kerjasama multi helix, pengembangan kapabilitas serta peran masing-masing aktor dalam menciptakan ekosistem inovasi. Keterhubungan industri dan universitas berperan penting dalam open innovation, sehingga diperlukan kemitraan perusahaan dan universitas bertujuan untuk memecahkan masalah dalam bentuk riset. Kerjasama pemerintah, industri dan universitas menjadi elemen penting bagi strategi inovasi yang berkontribusi secara nyata pada situasi perubahan lingkungan karena pandemi COVID-19. Salah satu bentuk respon kerjasama dilakukan oleh pemerintah Indonesia dengan secara aktif melakukan riset inovasi guna memberikan kontribusi bagi penanganan kondisi perubahan lingkungan. Konseptual paper ini bertujuan: pertama untuk pengembangan konseptual bentuk kerjasama sebagai respon kondisi perubahan lingkungan, serta tujuan kedua memberikan gambaran kontekstual riset inovasi kerjasama multi helix khususnya di Indonesia.

Kata Kunci: kerjasama, multi helix, inovasi, respon dan perubahan lingkungan

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Abstract

The collaboration of various actors in research and innovation is needed in dealing with the conditions of the COVID-19 epidemic. The situation in the COVID-19 pandemic is a condition of extreme change, a disaster that needs to be responded to by the government. The response is carried out within the framework of collaboration. The study of technological research, innovation and the role of science in the success of innovation in changing environmental conditions is very important. Research is carried out by research bodies, governments and international organizations. The increase in Responsible Research and Innovation (RRI) shows a serious effort to address the challenges of change. The research carried out includes multi helix collaboration, capability development and the role of each actor in creating an innovation ecosystem. The connection between industry and universities plays an important role in open innovation, so that partnerships between companies and universities are needed to solve problems in the form of research. Government, industry and university collaboration is an important element of an innovation strategy that contributes significantly to the situation of environmental change due to the COVID-19 pandemic. One form of collaborative response is carried out by the Indonesian government by actively conducting innovation research in order to contribute to handling environmental change conditions. This conceptual paper aims: firstly to develop a conceptual form of collaboration as a response to changing environmental conditions, and the second objective to provide a contextual overview of the innovation research in multi helix collaboration, especially in Indonesia.

Keywords*: collaboration, multi helix, innovation, response, environmental changes*

Introduction

The study of technological research, innovation and economic growth as well as the role of science in the success of innovation and economic growth is considered quite important (EENE, 2014). Suseno and Standing (2018) direct research on the role of various components of the innovation ecosystem interacting and performing at the system level. Research is carried out by research bodies, governments and international organizations. An increase in Responsible Research and Innovation (RRI) indicates a serious effort to address environmental challenges.

Environmental changes are often identified as hypercompetition or unpredictable conditions. Schoemaker (2018), calls it a condition of Volatility, Uncertainty, Complexity and Ambiguity (VUCA). Such a situation occurs during extreme environmental changes faced by the world in 2020. The outbreak of the Corona virus epidemic or what is known as COVID-19 is an extraordinary event (Baldwin and Mauro, 2020). The occurrence of the COVID-19 outbreak is an extreme condition, in the form of a disaster so that response actions are needed.

Martinelli et al. (2018) reveals the need for a proactive movement to create change with available resources, in dealing with crisis situations. Bharosa and Janssen (2009) mention that in conditions of high dynamic level, such as disasters, configuration of various elements is required in response to rapid changes. However, a lockdown policy or the like, can directly impact the country's productivity and economy. Wyplosz, C. (2020) explained that the case of COVID-19 had an impact on the global economy.

The existence of important changing conditions encourages a country to design economic policies with efforts to develop an environment of science, technology and innovation (Krammer, 2017). These efforts were made to achieve global competitiveness and sustainable economic growth (Sener and Saridogan, 2011). For this reason, the country needs an urgent strategy to direct economic growth based on research and innovation, development and technological progress (Long, 2019). Because of these conditions, the connection between science, technology and innovation with the economy is important (Lundvall and Borass, 2005; Pugliese et al., 2020).

Research purposes

This paper aims to develop a conceptual form of collaboration as a response to changing environmental conditions, also to contribute conceptual knowledge in orchestration, or what can be called a knowledge-based orchestration. The second objective is to provide a contextual overview of multi-helix collaborative innovation research, especially in Indonesia.

Literature Review

National Innovation System

Nieminen et al. (2016) stated the importance of science, technology and innovation (STI) as one of the keys to driving economic competitiveness. In relation to the importance of STI for development, the United Nations (UN) discussed in the agenda for sustainable development 2030. The UN recommends STI as a key driver and acceleration of global transformation in a sustainable economy in developing and developed countries (UNCTAD, 2019). Furthermore, Walsh (2020) explained the UN 2030 Agenda, especially the Means of Implementation (MoIs) document to achieve Sustainable Development Goals (SDGs) and 169 core targets. In this regard, STI is identified as a central tool for the implementation of the SDGs. Innovation is the key driver of economic growth and the main source of competitiveness in the global market (Raghupathi and Ragupathi, 2019). The policy in innovation is a form of state and government

responsibility. The government plays a role through policy in research, technology and innovation (Kuhlmann, 2003).

Government policies on innovation are developed through a national innovation system. The national innovation system is seen as an effective tool to understand a country's competitive advantage (Samara et al., 2012), as well as playing an important role for a country's economic development (Bartels et al., 2012). Schwartz and Bar-el (2015) mention that the innovation ecosystem is the key to competitiveness and economic growth of companies, regions and countries. Raghupathi and Ragupathi (2019) propose the state to create a national innovation ecosystem through the integration of science, technology and innovation. Efforts to develop a national innovation ecosystem are complex challenges (Suseno and Standing, 2018).

Innovation in Cooperation to Overcome Disaster

The events of various disasters in the world, have given rise to an experience of disaster response and recovery efforts. Governments are not capable of dealing with disasters alone. The success of disaster management cannot be separated from the role and involvement of various parties. Cooperation of various parties will provide enormous benefits.

The government in responding to disaster relief efforts requires support from various parties. Helsloot and Ruitenberg (2004), suggest that the government where a disaster occurs may not be able to respond to all aspects of disaster response and recovery efforts alone. Environmental changes such as disasters encourage the process of creating new ideas and innovations (Brink 2016; Fukuda, 2020). Furthermore, in reality the process of collaboration and innovation is difficult to do without innovation management, and the support of the culture and environment of the institution. Efforts to build a national innovation ecosystem require coordination and sustainability between government, business and academia.

Method

The research method was prepared using 3 stages consisting of stages which include the stages of research review, literature review and contextual results.

First stage

At this stage, a brief exploration of the concepts of collaboration and innovation proposed by several researchers was conducted. This stage is carried out by conducting a literature review based on search and exploration using the main source database of journals Q1-Q4.

Second stage

At this stage, the concept of multi-helix cooperation is explored. This stage is carried out by identifying and analyzing the material. The results of the literature review are presented in figures and tables.

Third stage

Literature review focuses on the conceptual basis, needs to be directed at contextual relevance and support with literature review analysis. The third stage is the synthesis of the concept of knowledge-based orchestration collaboration and contextual research on multi-helix collaboration innovations, especially in Indonesia during the COVID-19 pandemic.

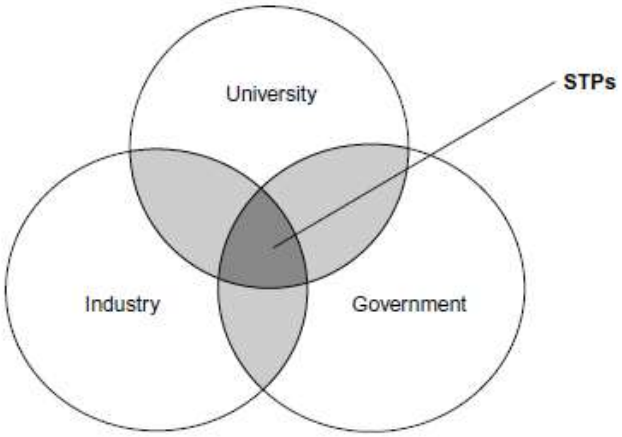
Results and Discussion

Triple Helix Collaboration Model

The collaboration carried out by the three government actors, universities and industry is important in sustainable development. Chen (2013) explains that the government and academic institutions play an important role in the research base of science and technology, but the private sector is needed for the successful commercialization of products. The national innovation system focuses on the dynamic process of various actors including academia, research institutions, government and industry, in building a collective value creation system (Carlsson et al., 2002). Institutional collaboration can be carried out between different research institutions according to their type (Glanzel and Schubert, 2004).

The interaction involving university, industry and government actors is a triple helix configuration and framework (Leydesdorff and Etzkowitz, 2002). The government has a role in maintaining the synergy of innovation development and economic growth. The triple helix model proposes the integration of three agents namely business, government and universities in the creation of a regional innovation ecosystem. The triple helix focuses on dynamics to accelerate the innovation ecosystem. Universities, companies and governments each play a role in these interactions. Universities through research results play a role in industrial development. The company develops training courses and shares knowledge and experience with universities. The government as a public actor plays a role through the form of rules (Etzkowitz and Zhou, 2018). Figure 1 shows the collaboration.

Figure 1. ***University-Government-Industry Triple Helix***



Source: Zhou (2011)

Multi Helix

Leydesdorff and Etzkowitz (1996) introduced the Triple Helix (TH) framework as a new dimension of collaboration. TH builds models and theories of university, industry and government relations to create a more effective innovation system. Zhou (2011) stated that different things were different, by providing an alternative interaction involving three actors, namely the government, universities and the public. In its development, the TH collaboration model involves civil society or end users as the fourth helix, known as the quadruple helix (Miller et al., 2016; Steenkamp, 2019). Carayannis and Campbell (2011) mention the triple helix model, quadruple helix and add the natural environment of society factor in the quintuple helix model.

Windrum et al. (2016) developed the concept of multi-agent co-creation. Co-creation can include multi-agents including the third organizational sector, the public sector and companies. The multi-agent framework has several advantages, namely, firstly it is suitable for modeling stakeholder interactions that co-create services. The second is that the framework makes explicit the preferences and competencies of different organizations. Researchers explain that multi-actor collaboration improves all phases of the innovation process (Sorensen and Torfing, 2011).

Indonesian Contextual

The government is trying to develop a national innovation ecosystem to build national capabilities (Suseno and Standing, 2018). The implementation of a national innovation system through innovation policy is crucial (Bartels et al., 2012). Developing countries that have aspirations to become economically developed countries use all efforts to develop innovation systems (Greenhalgh, 2016).

The state's efforts to build a national innovation system in order to create a developed country are carried out by the Government of the Republic of Indonesia. The Government of the Republic of Indonesia in 2019, during the second term of President Joko Widodo's leadership, seeks to create an Indonesian state whose economy is advanced based on science, technology and innovation. The program was launched as an effort to achieve advanced Indonesia in 2045. For this reason, cooperation from various parties and innovation is needed to make Indonesia a developed country (Perpres RI No. 18 of 2020).

One of the efforts made by the government is through the establishment of the National Research and Innovation Agency (BRIN). The formation of the new agency is expected to be able to encourage the formation of an ecosystem of science and innovation in Indonesia. BRIN acts as a consolidator of research and innovation activities to focus on developing strategic research priorities. The final impact is expected to be rapid economic growth through research and innovation (www.ristekbrin.go.id).

The decision to establish the agency is contained in Peraturan Presiden RI Nomor 73 Tahun 2019. In accordance with article 2, BRIN has the task of carrying out research, development, study, and application, as well as integrated inventions and innovations. In carrying out its duties, BRIN carries out its functions related to planning and coordinating national systems related to science and technology (Perpres RI No. 74 of 2019).

Furthermore, for the success of the national innovation system, cooperation between various parties is needed. Cooperation of various parties is carried out by involving research institutions and other parties. Research institutions that have close links with science and technology in Indonesia include research institutions within BRIN (BPPT, LIPI, LAPAN, BIG and Ministry of Research and Development). On the other hand, universities (PT) as research institutions play an important role in efforts to advance the nation. BRIN and PT have the same interests in the development of science and technology through research. However, the government's efforts to advance the nation through the establishment of BRIN, apart from being supported by the world of education, also need to get support from the business world (industry).

The collaboration of various actors in research and innovation is indispensable in dealing with the COVID-19 pandemic (Crick and Crick, 2020; Fakruddin, 2020; Farrugia, 2020). The COVID-19 pandemic situation is a form of extreme change, a disaster that the government needs to respond to (Fakruddin et al, 2020). The Indonesian government immediately responded to the pandemic condition through Keputusan Presiden RI Nomor 7 Tahun 2020 concerning the Task Force for the Acceleration of Handling COVID-19 which was changed to Keputusan Presiden RI Nomor 9 Tahun 2020. The COVID-19 pandemic was one of the changing situations that prompted the world of research and innovation in Indonesia to more advance. Based on the presidential decree, the government involved the Ministry of Research and

Technology/National Innovation Research Agency (Kemenristek/BRIN) in an effort to accelerate the handling of the pandemic (Keppres RI No. 9 Tahun 2020).

Through this presidential decree, the Ministry of Research and Technology/BRIN has the task of supporting efforts to prevent, detect, and respond quickly to the COVID-19 pandemic through Research, Development, Assessment and Application (Litbangjirap) activities. Furthermore, based on the press release of the Ministry of Research and Technology/BRIN Number: 47/SP/HM/BKKP/III/2020, the Ministry of Research and Technology/National Research and Innovation Agency (Kemenristek/BRIN) has formed a COVID-19 research and innovation consortium. This consortium was formed at the initiative of the Ministry of Research and Technology / BRIN to support the acceleration of handling the Covid-19 pandemic in Indonesia. A consortium consisting of research institutions under the coordination of the Ministry of Research and Technology/BRIN such as LIPI, several universities (PT), Research and Development (R&D) of the Ministry of Health and involving the business world, both private and state-owned enterprises, has a focus on helping prevent and detect COVID-19 quickly through research and development innovation. BRIN implements a triple helix collaboration within the Research and Innovation Consortium on COVID-19 to connect the world of research with the world of industry and government (www.ristekbrin.go.id).

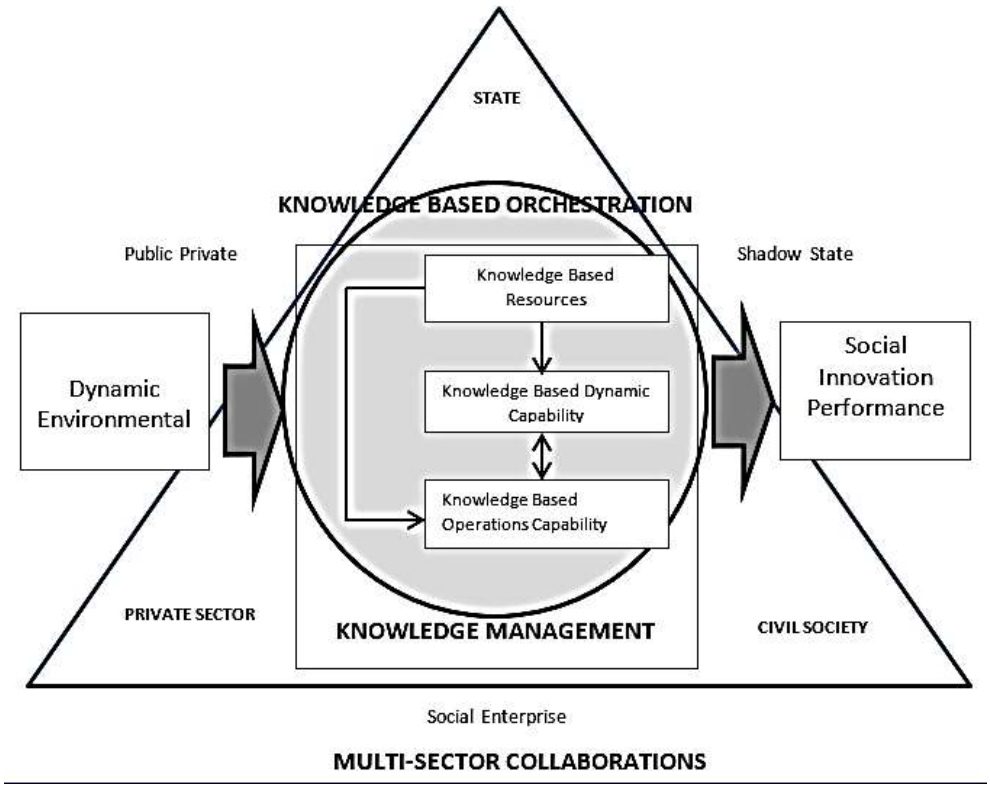
Conclusion

The events of various disasters in the world have given rise to an experience of disaster response and recovery efforts. In the face of a disaster, the participation of various parties is required. The government's main focus in handling the pandemic is to continue to prioritize public health and safety. Handling in the health sector is the key so that the handling of the economy that goes hand in hand can run well. In addition to the government, industry and education approaches, community participation as part of civil society in Indonesia is very important, especially during the pandemic. The spirit of togetherness in the social action of the Indonesian people is quite high, carried out voluntarily. Community participation is realized through social innovations in their respective regions when facing a pandemic situation. This is done to protect the community in order to avoid or minimize the risk of being affected by the COVID-19 virus. Creative ideas and various activities are carried out by the community in mutual cooperation. Gotong royong is an important form of social capital action for Indonesia during the COVID-19 pandemic.

These organizations include the community, government agencies (public services), the private sector and education (penta helix). Orchestration is like a conductor of musicians in an orchestra whose function is to create harmonization of various abilities for value creation. Organizations have important resources and capabilities, and need to be combined to create successful performance.

Knowledge-based approach is important as a determinant of performance. This paper also contributes conceptual knowledge in orchestration, or can be referred to as knowledge-based orchestration based on community contributions. Environmental change and disaster situations encourage knowledge-driven response efforts. Knowledge-based orchestration is expected to encourage organizations that have an impact on accelerating recovery from the COVID-19 pandemic. The orchestration of resources and capabilities is needed as a driving force for the organization, which contributes to success in dealing with the COVID-19 pandemic. The concept of knowledge based orchestration is proposed through the following conceptual framework of Figure 2:

Figure 2. Knowledge Based Orchestration Concept in Multi-Sector Collaborations Framework



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