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Indonesia's Innovation Policies: Evolution and Institutional Structure

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ABSTRACT

Along with world developments encouraging every country to innovate, Indonesia also has aspirations to increase domestic innovation. The driving force is the success of several other countries in improving economic growth through innovation. Indonesia shares the same desire to focus on innovation, science, and technology. Along the way, innovation policies in Indonesia have been developed in terms of institutional structure and implementation of innovative programs. This paper tries to identify how the innovation policy has developed through quantitative analysis of innovation, science, and technology regulations starting in 2004. This paper divides the regulations into four eras according to the era of the elected president from 2004 to 2024. A multi-dimensional quantitative methodology is carried out to examine Indonesia's innovation policies. The policy search is carried out by searching for regulations in two Indonesian regulatory databases. From the analysis results, it is found that Indonesia has driven S&T and innovation policies, including policies that support innovation funding, and has made several changes to the formation of innovation organisations to produce better coordination between researchers who create innovative products and industries as users.

I. INTRODUCTION

The World Bank report mentioned that innovation is critical to productivity growth and economic progress in a rapidly changing world. Lin (2017) mentioned that continuous technological innovation in modern economic growth increases low-value-added industries to become higher-added ones.

Consequently, this approach drives the country to increase trade and market exchange. Indirectly, it also pushes technology and industry into higher advancement.

Indonesia is one of the largest developing countries in Asia, with an average innovation index of 29.47 points from 2011 to 2020. According to the innovation index ranking, Indonesia was ranked 84th out of 131 countries in the world in 2020. This ranking is very far when compared to

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neighbouring countries, such as Singapore (8th), Malaysia (33rd), Thailand (44th), and Vietnam (42nd). As innovation is an essential factor that drives economic success, Indonesia must make a concerted effort to boost its innovation capacity through research, development, and the application of science and technology.

Innovation policy is a term used to denote all policies that impact innovation or any policy instruments formed to influence innovation (Fagerberg, 2017). In Indonesia, the formal approach mentioned in research, development, and the application of science and technology is validated by Law 18/2002. Since Law 18/2002 was published, new legislation has been drafted to establish a firmer foundation for broader-based R&D (research and development) and innovation policies to enhance the national innovation system. Innovation policy began to develop rapidly in Indonesia after 2002.

Various research instruments are applied to support innovation in a country to reinforce economic growth. However, seeing the effectiveness of the impact of innovation policy instruments is not easy because different policy instruments may interact, making it difficult to distinguish their individual effects (Edler & Fagerberg, 2017). For this reason, a combination of policy instruments is needed, namely with political agendas that require capabilities among policymakers that cannot be taken for granted but need to be fostered (Edler & Fagerberg, 2017).

Government and policy have an important role in innovation. The World Bank book (2010) states that the government is like a gardener in a garden because the government can intervene in areas of particular importance. Innovation policy requires action in various policy areas, such as education, investment, finance, and incentives. For this reason, various appropriate instruments are needed to support innovation.

Previous research has shown the impact of innovation policies. For example, at the company level, investment in R&D has positive effects on revenues, profits, return on assets (ROA) and return on equity (ROE) (Tung & Binh, 2022). Research at the country level showing government policies is carried out shows. This research shows that entrepreneurship policies that are technology transfer, fiscal and tax, digital transformation, talent, and government innovation management journals, are sufficient conditions for high regional innovation capability. Bong et al. (2022) found that university technology transfer promotes entrepreneurship and stimulates regional employment growth. Specific to GDP, research by Zhou et al. (2022) showed a significant interaction between STI (science, technology, and innovation) supply, demand, and environmental policies with GDP.

The role of government funding for R&D has an impact on R&D carried out by companies. Government R&D subsidies positively affect corporate R&D investment. It is also found that the additionality effect is more significant when R&D subsidies are provided to SMEs than to large enterprises (Chung et al., 2021).

Research on innovation policy in China has been conducted by Liu et al. (2011), who found that policy in China has carried out a centralised innovation strategy with better coordination between institutions. Specifically, discussing policies regarding the linkages between universities, industry, and government to increase innovation in Korea (Yoon & Park., 2017) show that the role of government is huge in influencing collaboration between industry and universities, which has increased in the 2000s compared to the 1900s.

With various innovation policy schemes, innovation development is expected to take place well. So, in the long term, it can increase economic growth. In the Indonesia case study, the existing literature has assessed the Indonesia innovation profiles, including innovation policies, innovation actors, and current innovation in Indonesia. This paper takes a different approach by quantifying Indonesia's innovation policies during the elected President era from 2004 to 2024. This paper analyses and assesses Indonesia's innovation policies' evolution and institutional structure. In addition, it can help the government to project Indonesia's innovation trajectory.

This paper is organised as follows: introduction, literature review, research methodology, result and discussion, and conclusion. A multidimensional quantitative methodology is carried

out to examine Indonesia's innovation policies. The policy search is carried out by searching for regulations in two Indonesian regulatory databases, peraturan.bpk.go.id and peraturan.go.id.

II. RESEARCH METHOD AND DATA

This paper adopts a multi-dimensional quantitative methodology to examine Indonesia's innovation policies. The first step is to analyse the Indonesian government's long-term and medium-term plans. Furthermore, a search for regulations was carried out with the keyword "innovation" in two Indonesian regulatory databases, namely the BPK RI JDIH Regulation Database, which can be accessed via https://peraturan.bpk.go.id/ and the information system of the Directorate General of Legislation, which can be accessed via https://peraturan.go.id/. After the innovation keywords have been analysed, a search for relevant regulations from existing legislation is carried out. The analysis results found 23 pertinent regulations to innovation policy in Indonesia. Interviews were conducted with innovation experts in Indonesia, particularly from the National Research and Innovation Agency, to increase the rigour of this study. As for the institutional structure, this paper only looks at the evolution of government agencies to support policies and innovation development in Indonesia.

III. DEVELOPMENT OF INDONESIA'S INNOVATION POLICIES

The regulation that underlies the development of innovation in Indonesia is Law number 18 of the year 2002 concerning the national research, development, and application of science and technology. This regulation defines innovation as research, development, and/or engineering activity aimed at developing the practical application of new scientific values and contexts or new ways of applying existing science and technology to products or production processes. This regulation regulates institutions, revenue from business entities for innovation, and government funding for innovation.

From the perspective of innovation policy in Indonesia, the innovation policy can be divided into four eras starting from 2004, as shown in Table 1. This follows the formation of a long-term development plan from 2005 to 2025, regulated in Law number 17 of 2007. This long-term plan is divided into five years, referred to as the five-year national medium-term development plan (*Rencana Pembangunan Jangka Menengah Nasional-RPJMN*). This medium-term development plan will serve as a guideline for ministries/agencies and local governments in preparing their respective regional development plans. In addition, this National RPJM is an elaboration of the president's vision, mission, and program due to the General Election.

This section will explain the review results related to innovation policies and are grouped into three themes: innovation policy, regulatory policy evolution, and institutional structure of innovation (see Table 1).

A. Innovation Policy

The government paid attention to innovation in the 2004–2009 RPJMN document, outlined in the Presidential Regulation of the Republic of Indonesia Number 7 of 2005. Issues regarding innovation contained in this RPJMN included the people's right to innovate, creating an innovation climate in the form of incentive schemes in the context of increasing scientific and technological capabilities, as well as increasing productivity and innovation in the context of improving the employment climate. In this era, the targets in the field of innovation were the arrangement of intermediation mechanisms to increase the utilisation of R&D results by business and industry, improve technological content in the national industry, and the growth of partnership networks within the framework of the national innovation system. In addition, the policy direction in the field of innovation was to create an innovation climate by developing appropriate incentive schemes to encourage strengthening industrial structures. This year, a regulation was enacted to allocate a portion of a business entity's income to increase innovation engineering capability and technology diffusion. This showed that in this era, R&D had

Table 1.
Description of the Indonesian government's policy on innovation in the period 2004–2025

Era	Law Number	Description	Type of Policy		
			innovation policy	regulative policy	institutional structure
National RPJM year of 2004 to 2009	Government Regulation of the Republic of Indonesia Number 35 of the Year 2007	Allocating a Part of the Business Entity's Revenues to Improve Engineering Capability, Innovation, and Technology Diffusion	✓		
	Presidential Regulation Number 16 of the Year 2005	Establishment of the National Research Council			✓
National RPJM year of 2010 to 2014	Presidential Regulation Number 32 of the Year 2010	National Innovation Committee			✓
	Presidential Regulation Number 32 of the Year 2011	Masterplan for the Acceleration and Expansion Of Indonesian Economic Development 2011–2025		✓	
	Presidential Regulation Number 14 of the Year 2012	Financial Rights for the Chair, Deputy Chair, Secretary, and Members of the National Innovation Committee			✓
	Presidential Regulation Number 42 of the Year 2014	Amendment to Presidential Regulation Number 32 of 2010 concerning the National Innovation Committee			✓
	Presidential Regulation Number 164 of the Year 2014	Dissolution of the National Innovation Committee			✓
National RPJM of 2015 to 2019	Regulation of the Minister of the Ministry of Research, Technology and Higher Education of the Republic of Indonesia Number 13 of the Year 2015	Strategic Plan of the Ministry of Research, Technology, and Higher Education 2015–2019		✓	
	Regulation of the Minister of the Ministry of Research, Technology and Higher Education of the Republic of Indonesia Number 33 of the Year 2016	Details of the Tasks of Work Units in the Directorate General of Strengthening Innovation, Ministry of Research, Technology, and Higher Education		✓	
	Government Regulation Number 38 of the year 2017	Implementation of Regional Innovation	✓		
	Ministerial Regulation of the Ministry of Research, Technology and Higher Education of the Republic of Indonesia Number 49 of the Year 2018	Establishment of Non-Structural Institutions of the Indonesian National Qualifications Framework			✓
	Presidential Regulation Number 38 of the Year 2018	National Research Master Plan 2017–2045		✓	
	Ministerial Regulation of the Ministry of Research, Technology and Higher Education of the Republic of Indonesia Number 40 of the Year 2018	National Research Priorities 2017–2019		✓	
	Financial Services Authority Regulation Number 13 /Pojk.02/2018 of the Year 2018	Digital Financial Innovation in the Financial Services Sector	✓		
	Presidential Regulation Number 74 of the Year 2019	National Research and Innovation Agency			✓
	Presidential Regulation Number 95 of the Year 2019	Amendment to Presidential Regulation Number 74 of 2019 concerning the National Research and Innovation Agency		✓	
	Ministerial Regulation of the Ministry of Research, Technology and Higher Education of the Republic of Indonesia Number 13 of the Year 2019	National Science and Technology Area Development Master Plan 2015–2030.		✓	
	Ministerial Regulation of the Ministry of Research, Technology and Higher Education of the Republic of Indonesia Number 24 of the Year 2019	College Innovation Management	✓		
	Ministerial Regulation of the Ministry of Research, Technology and Higher Education of the Republic of Indonesia Number 29 of the Year 2019	Measurement and Determination of Innovation Readiness Levels	✓		
	Ministerial Regulation of the Ministry of Research, Technology and Higher Education of the Republic of Indonesia Number 36 of the Year 2019	Research Information System	✓		
	Ministerial Regulation of the Ministry of Research, Technology and Higher Education of the Republic of Indonesia Number 38 of the Year 2019	National Research Priorities for 2020–2024		✓	
National RPJM for yearsyear 2020 to 2024	Ministry of Finance Regulation Number. 6/Pmk.05/2020	Service Fees for the Public Service Agency of the Science and Technology Demonstration Center at the Ministry of Research and Technology/National Research and Innovation Agency	✓		
	Regulation of the Minister of Education and Culture Number 35 of the Year 2020	Revision of the tasks of the Indonesian National Qualifications Committee to standardise the global market.			✓
	Presidential Regulation Number 112 of the Year 2020	Dissolution of the National Research Council			✓
	Presidential Regulation Number 31 of the Year 2021	Structuring the Duties and Functions of the Ministry of Education, Culture, Research, and Technology and the Ministry of Investment/Investment Coordination Agency in the Advanced Indonesia Cabinet for the 2019–2024 Period	✓		

been included as an essential factor supporting innovation in government regulations.

In the 2010–2014 RPJMN document, innovation aimed to increase national capacity in conducting research, creation, and innovation as well as facilitating access and utilisation of culture by the broader community. During this period, cooperatives and SMEs were explicitly encouraged to develop innovation and technology competencies for sustainable economic growth. In this period, science and technology development was carried out to manage interactions and relationships between supporting elements and streamline interactions between technology-producing institutions and external interactions with the business world so that innovation could manifest in the provision of beneficial goods and services community. Thus, science and technology policies were directed at increasing the capacity and capability of R&D institutions as well as supporting institutions to support the transfer process from ideas, turning them into laboratory prototypes, becoming industrial prototypes, and then continuing as commercial products (strengthening the national innovation system).

From 2015–2019, one of the targets in the field of innovation was to create a competitive nation by building quality and competitive human resources, increasing mastery and utilisation of science and technology through research, development, and application towards innovation in a sustainable manner. One way to increase the capacity of human resources was by accelerating and expanding the development of vocational schools, polytechnics, community academies, and job training centres. In addition, to strengthen the competitiveness of the national manufacturing industry, it was necessary to develop Science and Technology Park (STP) as a centre of excellence (business/private-government-Higher Education cooperation) to encourage the growth of technological innovation, particularly in the agricultural and industrial sectors. To support it, the government increased the research budget to promote technological innovation. During this period, the specific strategy for increasing innovation and technology capacity was to build National STPs, develop provincial science parks, and build technoparks in districts/cities.

In 2020–2024, the goals related to innovation in this plan are agendas linked to strengthening economic resilience for quality growth. This is done by increasing innovation and investment quality, which are the main capital to encourage higher economic growth. This is based on the evaluation results, which state that the innovation system is still ineffective, and the innovation ecosystem has not yet been fully created, so the downstream process and commercialisation of R&D results are hampered. Therefore, it is necessary to build an innovation ecosystem supported by a commitment to increase national R&D spending to boost economic productivity through innovation.

R&D expenditures are one part that plays an important role in the birth of innovation. In some countries, the amount of R&D expenditure has been considered a central element of innovation policy (Edler & Fagerberg, 2017). Even though the amount of funds for R&D is not specifically stated in a certain policy, the funds provided by Indonesia were still around 0.3% of total GDP in 2019, which is the largest percentage of the available data and is still relatively small compared to other countries such as Japan, Malaysia, and Singapore (Huda et al., 2020).

B. Regulative Policy Evolution

In the 2004–2009 RPJMN, the government established Government Regulation Number 35 so that business entities allocate part of their income for capacity building and engineering, innovation, and technology diffusion.

The movement of innovation and R&D in Indonesia has been significant since the 2010s. In this era, there were some substantial improvements in R&D policies in terms of institutional and funding. Formal policies supporting science, technology, and innovation activities were outlined in the concept of linkages between the government, universities, and industry and then rewritten in 2011 through Government Presidential Regulation Number 32 concerning the master plan for the acceleration and expansion of Indonesia's economic growth development for

2011–2025. One of the three primary missions was to strengthen the national innovation system in production, process, and marketing to enhance long-term global competitiveness toward an innovation-driven economy. The triple helix concept was widely contemplated during the development of this master plan. It drew many researchers to support the development of innovations in various case studies (Fitriati & Rahmayanti, 2012; Martini et al., 2012; Perdana & Kusnandar, 2012; Sunitiyoso et al., 2012). However, R&D funding did not significantly increase, in line with the development of R&D activities (Rasiah, 2018). This issue was widely discussed in 2012, but somehow, it deteriorated from government programs and published research.

Furthermore, in 2015, the Strategic Plan of the Ministry of Research, Technology, and Higher Education for 2015–2019 was issued through the Regulation of the Minister of Research, Technology and Higher Education Number 13. This regulation explained the target for increasing the ability of science and technology to support national and regional innovation systems. In addition, this document also described the weakness of the tax policy strategy that hinders research investment for innovation development. Overall, the innovation strategy planned to rest on the role of universities through inventions from the community and industry. It was also supported by the 2017–2019 national research priorities through Presidential Regulation Number 38 of 2018. Not only that, but to support the innovation process to impact the country's competitiveness, the Ministry of Research, Technology, and Higher Education has also begun to form the Indonesian National Qualifications Framework through Ministerial Regulation Number 49 of 2018. This regulation standardised the output of education, training, and work experience for maintaining the quality of Indonesian human resources. In 2020, an update was carried out by changing the assessment standards with other countries to improve the quality of Indonesian human resources at the global market level.

The Ministry of Research, Technology and Higher Education Regulation Number 24 of 2019 concerns managing higher education innovations. This regulation aims to encourage innovation management performance in each university. It will be one of the elements of consideration in university accreditation, ranking universities, providing incentives, and awarding Higher Education achievements in innovation. In addition, the Ministry of Research, Technology and Higher Education Regulation Number 29 of 2019 concerns the measurement and determination of the level of innovation readiness. The level of innovation readiness is a method for estimating the innovation readiness of an innovation program in companies, research and development institutions, and universities, aiming to determine the readiness status or position of the cycle in the life of innovation.

The government used policy instruments to attract the private sector to engage in R&D and innovation activities, including tax breaks. To support innovation funding, the government carries out various policies such as Ministry of Finance Regulation Number 76/PMK.03/2011 of the Year 2011, which contains donations for research, and Ministry of Finance Regulation Number 198/PMK.010/2019, which concerns tax exemptions on goods used for research and scientific development purposes. In 2020, the Minister of Finance regulation provided services to demonstrate science and technology to the public. This was part of commercialising science and technology results, whose funds would be collected by the Ministry of Research and Technology/BRIN.

One of the other policies is related to the innovation information system. In 2019, the government also launched a research information system to increase the effectiveness of innovation creation through the Ministerial Regulation of Research Technology and Higher Education Number 36.

From the results of the regulation evolution, several policies have been used by the Indonesian government, including incentives for R&D, policies to support collaboration, direct support for first R&D and innovation, regulation, and standards. Other policies implemented in several other countries that can be considered include policies for training and skills, entrepreneurship policy, cluster policy, innovation inducement prizes, and technology foresight (Edler & Fagerberg, 2017).

C. Institutional Structure

The institution's role is swift to become increasingly important in the innovation process, from being viewed as rigidities and obstacles to innovations to being seen as supporting factors for innovation (Edquist, 2013). This paper defines the institution of state agencies, universities, and firms. Thus, this section focuses on the organisation and utilisation of universities, industrial research, and R&D departments in large firms and state agencies.

By definition, Lundvall (1992) revealed that an innovation system is created from several interactions between elements and sectors that create knowledge or economic products within a country. Therefore, each country needs to explore the interaction between various sectors that drive innovative economies (Fromhold-Eisebith, 2007). In more detail, Fagerberg & Srholec (2007) stated that countries that have successfully built their innovation systems tend to have good governance systems that balance the quality of human resources, technology, and knowledge produced. Therefore, it is important for the state to optimally manage and encourage the process of exchanging tacit knowledge in creating innovative products involving academia and business (Maskell & Malmberg, 1999).

In Indonesia, the state agency that becomes the coordinator and the policymakers in the field of science and technology development is run by the Ministry of Research and Technology. In 1962, this ministry was first known as the State Ministry of National Research Affairs and was changed to the State Minister of Research and Technology in 1986. In this era, the policy focused on developing marine technology and aerospace as well as creating technical experts by sending technical experts to get higher education overseas. In addition, even though the ministry has changed its name, its main concerns are accelerating the research conducted by R&D departments owned by the government and universities. In this era, the main focus is to increase the number of researchers even though the area of research is still sporadic based on the R&D department and universities' expertise. Therefore, to support the ministry, the National Research Council was formed to direct the research activities of various institutions based on Indonesia's development priorities in 1984, which was under and responsible directly to the State Minister of Research and Technology. The National Research Council has the main task of preparing the direction and priority for national research and technology programs and working on policy and system aspects of institutions that need to be developed to stimulate, collect, and synergise the development capacity of science and technology.

Furthermore, National Innovation Committee (NIC) was formed in 2010 to increase Indonesia's productivity through innovation and support innovation strengthening. The NIC was responsible for assisting the president in strengthening the national innovation system, providing input and considerations regarding program priorities and action plans, as well as monitoring and evaluating the national innovation system program. For this reason, the objectives of the STP in this period were planned by the NIC. However, in 2014, this institution was disbanded with consideration of the end of the presidential term of office.

In 2014, the Ministry of Research and Technology was merged with Higher Education to become the Ministry of Research, Technology and Higher Education (Burhani et al., 2021). This was done to ensure that higher education intersects with activity research and innovation, from the undergraduate to university level. Furthermore, it also merges two ministries aligned with the Indonesian policy of not solely relying on commodities. In this era, there was a Directorate of Innovation Strengthening of the Ministry of Research, Technology and Higher Education through the Ministry of Research, Technology and Higher Education Regulation Number 33 of the Year 2016. This agency was tasked explicitly with reviewing regulations in innovation and disseminating legislation in the field of invention.

However, the government saw that merging both ministries was challenging to implement. In addition, the research and innovation increased, but it did not align with the plan. Therefore, in 2019, the focus of research and education was separated. The Ministry of Research and Technology/BRIN (National Research and Innovation

Agency) focused more on research. Meanwhile, educational aspects were returned to the Ministry of Education and Culture. In addition, the responsibility of the national research council in 2020 was transferred to the Ministry of Research and Technology/BRIN (Wahyudi & Arlinta, 2020). However, government regulation Number 164 of the Year 2014 merged the National Innovation Commission with the Ministry of Research and Technology/BRIN.

In 2021, the government sought to move into a developed country. Indonesia needs various inventions produced by research and development (institutions in both the public and private sectors as well as at the universities). Unfortunately, most research stagnates at the inventions (publications, prototypes, and patents). Research from various research and dematerialised institutions is often not relevant to the needs of users or industry. The research results have not materialised into manufacturing output at the industrial stage or as a policy innovation. Therefore, the government decided to dissolve the Ministry of Research and Technology and incorporate its functions into the Ministry of Education. Then, the National Research and Innovation Agency (BRIN), the institution for implementing national research attached to the Ministry of Research and Technology, will become an autonomous body. In addition, to maximise the potential for innovation through adequate investment, the government issued Presidential Regulation Number 31 of the Year 2021 regarding the coordination of investment for the 2019–2024 period between the Ministry of Education, Culture, Research, and Technology and the Ministry of Investment/ Investment Coordination Agency.

IV. DISCUSSION AND ANALYSIS

In Indonesia, the S&T policy was officially regulated and implemented through Law Number 18 of the Year 2002, governing national research into the development and the application of science. This policy defines innovation as research, development and/or engineering activity that aims to apply existing science and technology to products or production processes. The policy also states that higher education institutions, R&D institutions, business entities, and supporting institutions are key to developing innovation.

By analysing the innovation journey contained in the 2004–2024 RPJMN, it could be identified that the planning was excellent. In the 2004–2009 RPJMN period, it was targeted to use R&D results by the business world and industry. In the 2010–2014 RPJMN period, it was targeted that the effectiveness of inter-institutional interaction would be so that the regulations issued in this period focus on institutions. In the 2014–2019 RPJMN period, many innovations were fostered with the development of many institutions to improve human resources. The 2020–2024 RPJMN period is targeted to develop an innovation ecosystem that focuses on commitments to increase national R&D spending. However, if it is viewed from the perspective of innovation development, a directed and continuous flow of innovation development has not been found between each period. This is because the design of each period is carried out by evaluating the development of innovation in the previous period, so it is difficult to identify the achievement of innovation development between periods.

Furthermore, the plans in each RPJMN have not been supported by regulations that explicitly indicate targets, supporting policies, and resources that must be provided to achieve them. Therefore, clear objectives in each period are needed to direct each related unit to work together to achieve these goals, as has been developed by South Korea. These clear objectives have been the basis for the successful development of their innovations (Kang, 2018).

The country is currently at the stage of institutional formation and has not yet focused its R&D activities on specific or mainstay sectors. Policies in Indonesia, especially those related to science, technology, and innovation, have been outlined in national laws, governmental policies and various planning documents. However, the fact that they are of short-term duration (contained in a 5-year plan) means that a change of government and/or president results in a shift in policy. Based on the interviews conducted in almost every Indonesian president's period, the shifts in policy related to innovation and research resulted in a situation

in which such activity was initiated again from square one. Therefore, the country needs to draft long-term science, technology and innovation policies whose contents will be adhered to by future elected leaders. This represents a long-term goal for science and technology innovation and development within the Indonesian context.

V. CONCLUSIONS

The innovation development plan in Indonesia has been included in the long-term development plan from 2005 to 2025. In addition, innovation development is also in the RPJMN every five years, following the vision and mission of the elected president. From the results of the analysis, it was found that the plans were excellent. Indonesian public policies tend not to be adequately implemented even though the process is made according to the procedure. However, from the perspective of innovation development, a directed and continuous flow of innovation development has not been found between each period. Furthermore, the plans in each RPJMN have not been supported by regulations that explicitly indicate targets, supporting policies, and resources that must be provided to achieve them.

One of the reasons is that research results, especially social or policy research, have not become a major consideration for policymakers. In general, the problems faced by research institutions or R&D government agencies in Indonesia include 1) National research agenda, which has not been integrated between each RPJMN period; 2) Weak coordination between research institutions.

This research only explored Indonesia's innovation policy based on government regulations. Therefore, a more holistic evaluation is required. The review covers the capabilities of each stakeholder and the interaction among government, educational institutions, R&D institutions, and industry. The capacities among stakeholders need to be evaluated to capture how to maintain and increase the capabilities as a part of the innovation policy strategy. On the other hand, the interaction among stakeholders needs to be investigated and understand how the innovation policy in Indonesia develops systematically oriented policies and uses them as National Innovation System.

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