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ANALYSIS OF NATIONAL RESEARCH AND INNOVATION AGENCY (BRIN) TRANSFORMATION READINESS TO ACCELERATE NATIONAL RESEARCH AND INNOVATION DEVELOPMENT USING SWOT ANALYSIS

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ABSTRACT

Based on the *Undang-Undangn Nomor 11 Tahun 2019* concerning the National System of Science & Technology established the National Research and Innovation Agency (BRIN), which oversees the research process from upstream to downstream. BRIN is an integrated institution of various research institutions in Indonesia, including the Indonesian Institute of Sciences (LIPI), the Agency for the Assessment and Application of Technology (BPPT), the National Nuclear Energy Agency (BATAN), and the Institute for Aeronautics and Space (LAPAN) and a combination of other R&D institutions. This paper aims to analyze readiness transformation National Research and Innovation Agency (BRIN) to acceleration development research and innovation national using SWOT Analysis. This study uses descriptive quantitative methods by distributing questionnaires to 32 respondents who work at BRIN. SWOT Analysis uses the IFAS (Internal Factor Strategic) matrix, which describes strength and weakness factors. The EFAS (External Factor Strategic) matrix describes the opportunities and threats. The results show that the weight of the score on the dimension of strength is 1.47, the weight of the score on the dimension of weakness is 1.28, the weight of the score on the dimension of opportunity is 1.58, and the weight of the score on the threat dimension is 1.19. The total value of the average score on the IFAS matrix is 2.75, and the total value of the average score on the EFAS matrix is 2.77

Keywords: *BRIN, Innovation, Research, SWOT Analysis*

A. INTRODUCTION

The research budget that almost reached 36 trillion rupiahs in 2019 is considered very large but has little impact on the research results obtained. The budget is spread to 45 ministries/agencies, making the research unfocused and lacking in depth. The source of the research budget, which mostly comes from the government is around 66% and is assisted by the private sector, which is 10%. Structuring *Balitbang* both at the central government and in the regions is not the

first time raised. Several previous studies have been carried out to examine the existence of R&D institutions in Indonesia and how they are managed, as was done by (Hidayat, D, 2010; Hidayat, 2005; Jannah, 2013a, 2018; Nielsson et al., 2014; Putera, 2013; Rahardjo, 2008; Surminah, I, 2005)

To develop an Indonesia that is adaptive, productive, innovative and competitive by the Vision of Indonesia that President Jokowi conveyed on July 14, 2019. The community can utilize the research results, it is necessary to improve, starting with the amendment of the *Undang-undang Nomor 18 Tahun 2002* (Presiden RI, 2002) to the *Undang-undang Nomor 11 Tahun 2019* (UURI, 2019) regarding the National System of Science and Technology (Law Sisnas Science and Technology), it is necessary to have an agency that oversees the research process from upstream to downstream which led to the formation of the National Research and Innovation Agency (BRIN). After issuing the Law, it was followed by the *Peraturan Presiden Nomor 74 Tahun 2019* (Presiden RI, 2019). The last was the ratification of *Peraturan Presiden Nomor 78 Tahun 2021* (Indonesia, 2021) concerning the National Research and Innovation Agency (BRIN). BRIN is a body that contains integrated research institutions, namely the Indonesian Institute of Sciences (LIPI), the Agency for the Assessment and Application of Technology (BPPT), the National Nuclear Energy Agency (BATAN), and the Institute for Aeronautics and Space (LAPAN), as well as other research institutions. BRIN is expected to simplify the bureaucracy, create autonomous institutions and manage budgets outside the government budget. In the *Peraturan Presiden Nomor 78 Tahun 2021*, it is stated that BRIN is responsible to the President for carrying out government missions in the fields of research, development, study, and application (*litbangjirap*), discovery & innovation, implementation of nuclear energy, implementation of the National Space Program including monitoring, managing, and evaluating the work of the Agency Regional Research and Innovation (BRIDA) by applicable regulations.

Two years since the Law on the National Science and Technology System until the emergence of two Presidential Regulations to prepare guidelines and structures for the implementation of BRIN, several parties doubt the position of BRIN because it does not have a clear structure and institution coupled with the sectoral ego of each research institution that is part of BRIN. Finally, the disbandment of the Eijkman Institute caused controversy because only State Civil Apparatus researchers could become BRIN employees.

Due to the above condition, it is essential to analyze the strengths, weaknesses, opportunities, and threats in BRIN's readiness in the development of national research and innovation. In addition to BRIN's primary function as a producer of research and innovation, BRIN is also expected to be actively involved in conducting research and innovation with universities and industry. The main objective is to drive new investments in science and technology that impact economic progress in Indonesia. This agency is expected to develop research that includes improving the quality of science and technology human resources encouraging better management of biological and intellectual property data and research networks at home and abroad. BRIN is also mandated to build an innovation ecosystem to establish cooperation between the government,

researchers, and the industrial world (DUDI). The others objective of the establishment of BRIN is to avoid overlaps that might hinder the development of science and technology and national innovation.

(Baglieri, 1997) states that research and development institutions can be measured using a matrix model, as shown in Figure 1 below. This matrix provides a framework for measuring R&D performance by the object (process vs output) and measurement domain (production vs transition-ie R&D implementation).

"Object "of measurement		Domain of Measurement: R&D "production (generation phase)	R&D "transistion" (transition phase)
Output		"Quantity" and "quality" of technology: R&D "good productivity" Technology stockt • Excellence • Originality • Long term visibility • Short term capability **2** **1**	External costumer satisfaction and R&D contribution to share holder value creation • Contribution to business goals **4** **3**
Process		Effectiveness of R&D "production" processes Performace of: • Long term planning • Short term selection • Project management • Operational activities	Internal costumer satisfaction and time performance of R&D "transistion" process Time-cost quality in: • New product development process • New process development

Figure 1 - Reference Model for R&D Performance Measurement
Source: Baglieri (1997)

In the 2018 UI-CSGAR study (Jannah, n.d.), it was highlighted that the Baglieri matrix evaluation was not easy to execute. For this reason, this paper attempts to use SWOT Analysis to analyze the readiness of BRIN transformation in order to accelerate the development of national research and innovation. SWOT Analysis is an acronym for Strengths, Weaknesses, Opportunities, and Threats Analysis. A SWOT analysis is a strategic planning tool used to evaluate the strengths, weaknesses, opportunities, and threats involved in a project (Ezeani et al., 2019). This method is used to determine the organization's condition as a basis for determining improvements and improvements by determining strategies by the organisation's characteristics and position (GÜREL, 2017). This method is appropriate for finding problems from 4 (four) different sides, with the following measurements: How (strengths) can take advantage of an existing opportunity (opportunities), how to reverse (weaknesses) to be an advantage, how (strengths) to face (threats), how to overcome (weaknesses) that can make threats (threats) become real or create a new threat.

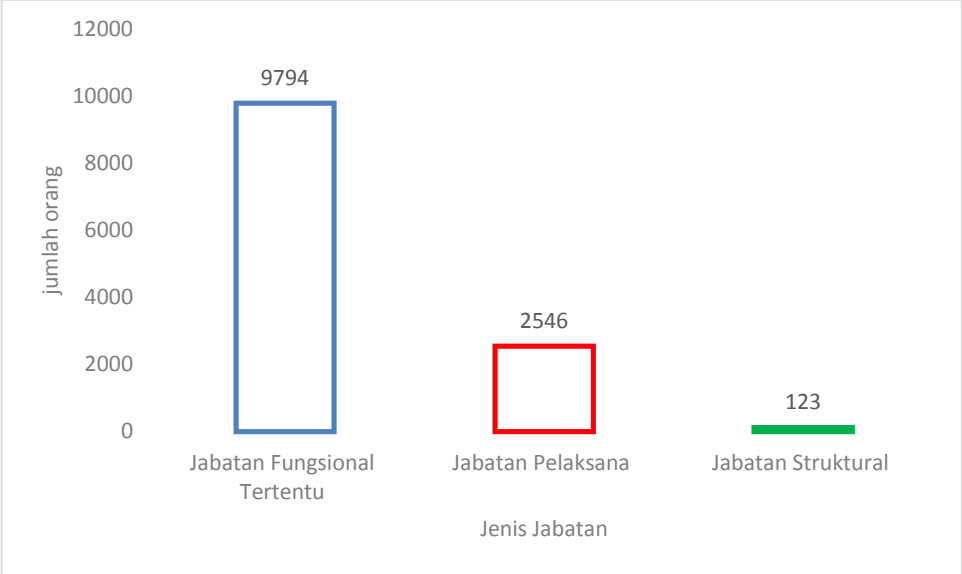
In the article (Namugenyi et al., 2019), SWOT is widely implemented in various institution initiatives such as strategic planning, quality control, and event

for development of government policies and laws. In implementation of SWOT, the organization need conduct several stages such as determining the objective of the organization in order to be relevant with the business/market and industry, setup priorities, develop strategies and implement the results of its research. Event SWOT analysis has more advantages than disadvantages, a lot of information is generated through SWOT analysis, but sometimes it is difficult to manage a number of alternative solutions and decisions (Namugenyi et al., 2019)

B. METHODS

This study used a quantitative method by distributing questionnaires to 32 respondents from various work units at BRIN. The task forces in question are the Bureau under the Main Secretariat in charge of internal services and office infrastructure, the satker under the Deputy who has duties in the field of external services and infrastructure, and the satker under the Research Organization, which has duties in the field of technical implementation research. The organizational structure of BRIN is shown in Figure 2.

The Civil Servant (ASN) positions at BRIN have been divided into 3 positions: structural positions, functional positions, and implementing positions. The graph of the composition of positions in BRIN can be seen in Graph 1.



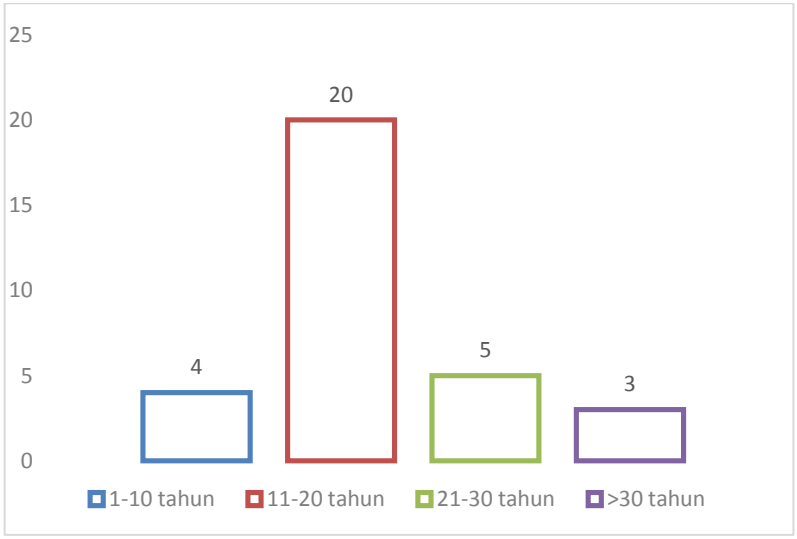
Source: Bureau of Organization and Human Resources of BRIN, 2021
Graph 1 – Position Composition at BRIN

Functional positions are the most dominant positions in BRIN. In contrast, the functional positions are budget analyst, scientific data analyst, legal analyst, personnel analyst, policy analyst, personnel analyst, an analyst for the use of science and technology, financial management analyst for APBN, plantation analyst, standardization analyst, human resources analyst, archivist, auditor, doctor, goods manager, researcher, radiation supervisor, manager of procurement of goods and services, developer of nuclear technology, development of learning

technology, engineer, planner, public relations institution, state budget financial institution, computer system, laboratory institution, nuclear institutions, librarians, technicians, trainers and certain other functional positions. The executive positions consist of goods and state property analysts, data and information analysts, and other general functional positions. Structural positions are only occupied by Eselon I and II.

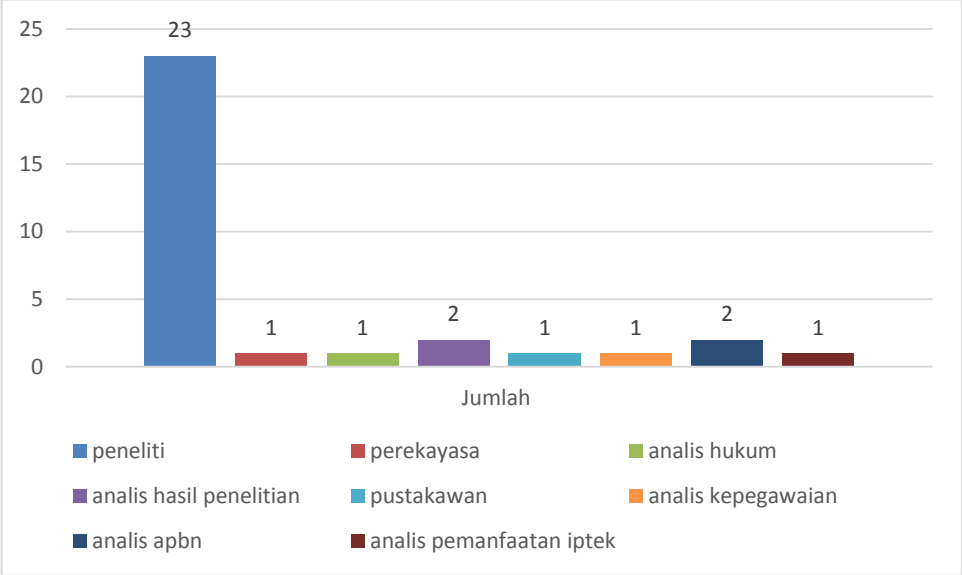
The questionnaires were distributed on December 6, 2021, using a random sampling questionnaire distribution technique. Random sampling is a quantitative research procedure for selecting participants, meaning that each individual has the same probability of being selected from the population (Creswell, W John; Creswell, 2018). The questionnaire uses a Likert scale with four answer options (Medzo-M'Engone & Ntsame Sima, 2021), 1 = strongly disagree, 2 = disagree, 3 = agree, and 4 = strongly agree. Data processing was carried out using the SPSS version 26 program.

The description of the respondents can be seen in Graph 2 below. Most of the respondents were those who had worked 11-20 years before joining BRIN.



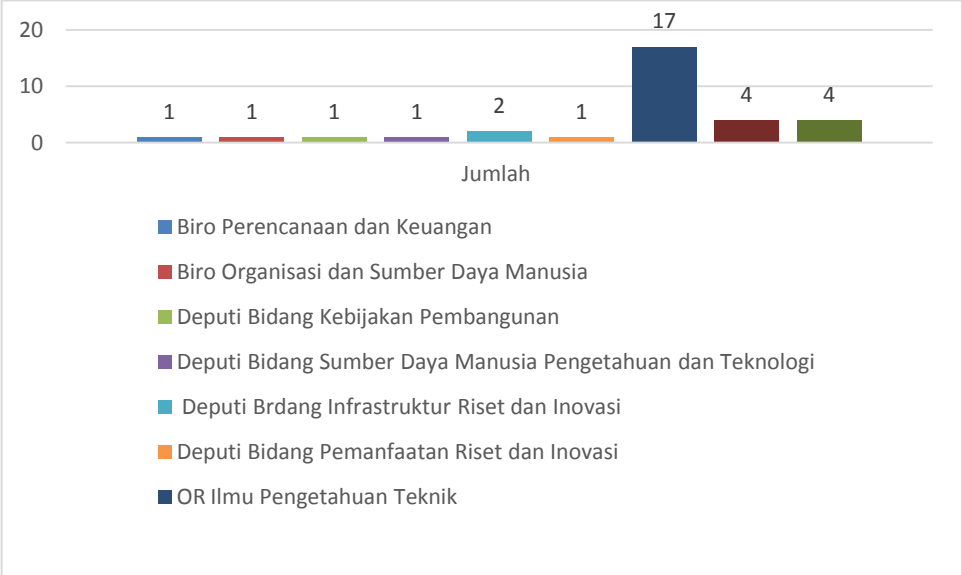
Source: Research primary data, 2021
Graph 2 – Respondents by Years of Service

Most of them have master's degree education (59.4%), are in group III (78.1%), and work as functional researchers (first, junior, middle and significant) as much as 71.9% with the following details:



Source: Research primary data, 2021
Graph 3 – Respondents by Position

Respondents were spread from several work units in the Bureau, Deputy and Research Organizations so that they did not represent the entire organisational structure of BRIN, as can be seen from the following graph:



Source: Research primary data, 2021
Graph 4 – Respondents by Work Unit

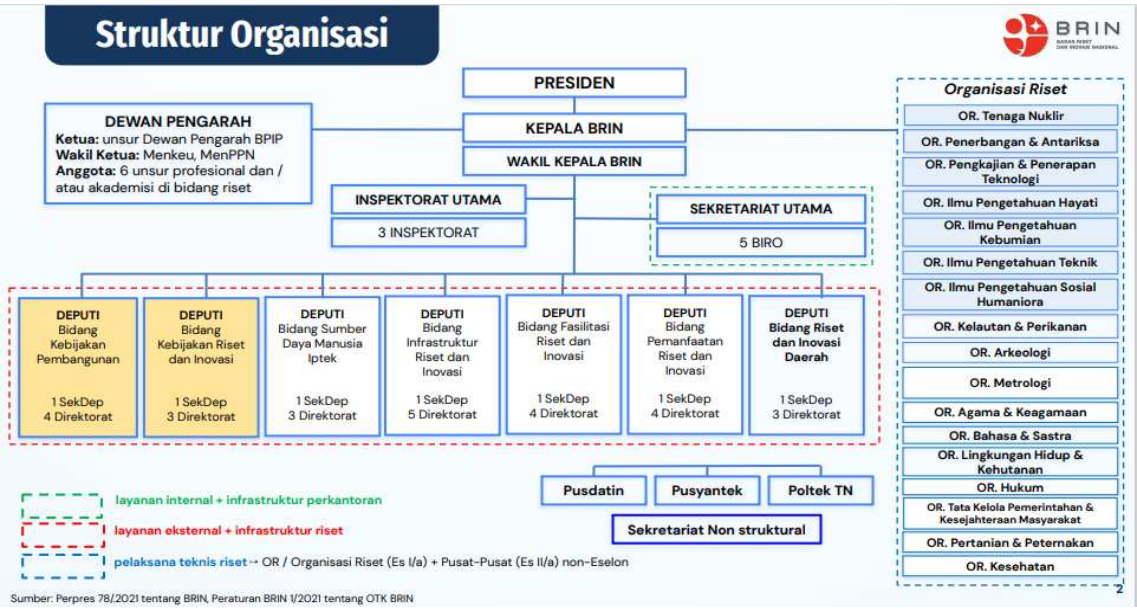


Figure 2. Organisational Structure of BRIN

C. EXPLANATION

SWOT Analysis Result Description

From secondary data collection in the form of literature, literature studies, previous research, and other related sources, the results of the SWOT Analysis description can be mapped, as can be seen in Table 1.

Table 1 – SWOT Analysis Results

Strengths	**Weaknesses**
1. Bigger and centralized budget 2. Easier coordination and collaboration because research institutions have been integrated 3. Easy to research because there is a lot of expertise 4. Availability of adequate research facilities and infrastructure 5. Shorter administrative path	1. There is a sectoral ego 2. There is a perception that the research group must be better than other research groups (the emergence of competition, not collaboration) 3. It takes time to unite the same vision and mission 4. There is still a non-research workload (structural and administrative) 5. The difficulty of outdoor research due to the pandemic
Opportunities	**Threats**
1. Expansion of the area and object of	1. The impartiality of government

R&D activities (research, development, assessment and application) 2. More and more new funding options (grants, loans, etc.) 3. Research collaboration with industry and other stakeholders 4. Research-based scholarship programs and Post Doc programs through incentives and research collaborations. 5. The need for national production competitiveness	policies towards research culture 2. Decrease in the level of public confidence in research results 3. There are job offers and facilities that are more attractive from the private sector and abroad 4. Moratorium on recruitment of research personnel 5. Refocusing the budget for the prevention of COVID-19

Source: Research primary data, 2021

Strength Analysis

The integration of four R&D and R&D institutions into BRIN namely LIPI, BPPT, BATAN and LAPAN as well as several other R&D and R&D institutions is a policy that is still being debated. It is hoped that this integration can build a more optimal development of research and innovation. For example, an increasingly large and centralized budget, facilities and infrastructure can be used by sharing, and easy collaboration and coordination.

In addition, there is a lot of scientific expertise from various fields to produce highly competitive research and innovations. The integration of the R&D institution also reduces the administrative route, which is in line with President Jokowi's work priority program, namely simplification of the bureaucracy. To produce in-depth research that can have a high impact on the community, takes a lot of money and time, so the transformation of R&D into BRIN is the right strategy.

Weaknesses Analysis

Although it has been stipulated in the *Peraturan Presiden Nomor 78 Tahun 2021* regarding the duties and functions of BRIN, the implementation of the integration has not run smoothly. This process still takes time due to the different organizational culture from the previous agency and the sectoral ego. According to (G. Hofstede, 2010) several factors influence organizational culture, namely: Power Distance Index (small versus large), measuring the extent to which organizational members who do not have power accept that there is an unfair distribution of power in the organization. In this culture, subordinates are reluctant to question or disagree with their superiors. In contrast, organizations with low power distance show an equal/equal relationship between superiors and subordinates. Subordinates are rarely afraid to disagree with their superiors. Uncertainty Avoidance (weak versus strong), measures the extent to which organizational members feel threatened by situations that are uncertain, unknown, ambiguous and unstructured. Organisational members may accept an uncertain future or seek to avoid it. The nature of this uncertainty is subjective and judged

by the opinions of others about violating organizational rules and their willingness to leave the organization. Individualism versus Collectivism, in Individualism, organizational members tend to pay attention to themselves and those close to them (spouse, children, parents). Individualistic cultures show a tendency to be more selfish and emphasize individual goals. Individualistic cultures emphasize job success and achievement or wealth and career advancement. Individualists emphasize the importance of aspects of personal time and work-related challenges. Collectivism is the tendency of people to join groups and then take care of each other with the consequence of exchanging loyalty among its members. Collective cultures place a greater emphasis on groups. Masculinity versus Femininity, Masculinity reflects a situation where values are dominant in society. Masculine society emphasizes the importance of assertiveness and competition (earnings, rewards/recognition, advancement/promotion and challenges in the work environment. Femininity reflects a society that has dominant values that care about others, harmony and serenity in life.This culture considers quality of life and helping others to be important. Work is seen as a method of earning money for a living. Long-Term Orientation versus Short-Term Orientation, is the development of research by (Hofstede, G. & Bond, 1988) which resulted in the dimension of "Confucian Dynamism". This dimension was later renamed to long-term orientation. Societies with a long-term orientation foster values related to future rewards, such as persistence and thrift. Society with a short-term orientation fosters values related to the past and present, such as respect for tradition, saving one's self-esteem, and fulfilling social obligations. *Indulgence versus Restraint,* Indulgence reflects a society that in its social order is very tolerant of the expression of desires and feelings, especially those related to the use of leisure time, seeking entertainment with friends, purchasing goods, consumption, and sexual matters. Restraint reflects a society that withholds the pleasures previously mentioned on the indulgence dimension. People in this condition tend to be less able to enjoy life.

Another weakness is that researchers are still burdened with administrative reporting tasks and for technical research that requires research in the field, it is rather difficult to do considering the current condition which is still a pandemic. Establishing an organizational culture in a new institution is very critical as a way of working for ASN personnel so that they can work in accordance with the new BRIN vision and mission. A comprehensive change management program is required to ensure the new organizational culture can be known, understood and implemented by all ASN personnel at BRIN. The following is a change curve that always occurs in every transformational program that occurs in all organizations (Kübler-Ross, 1969):

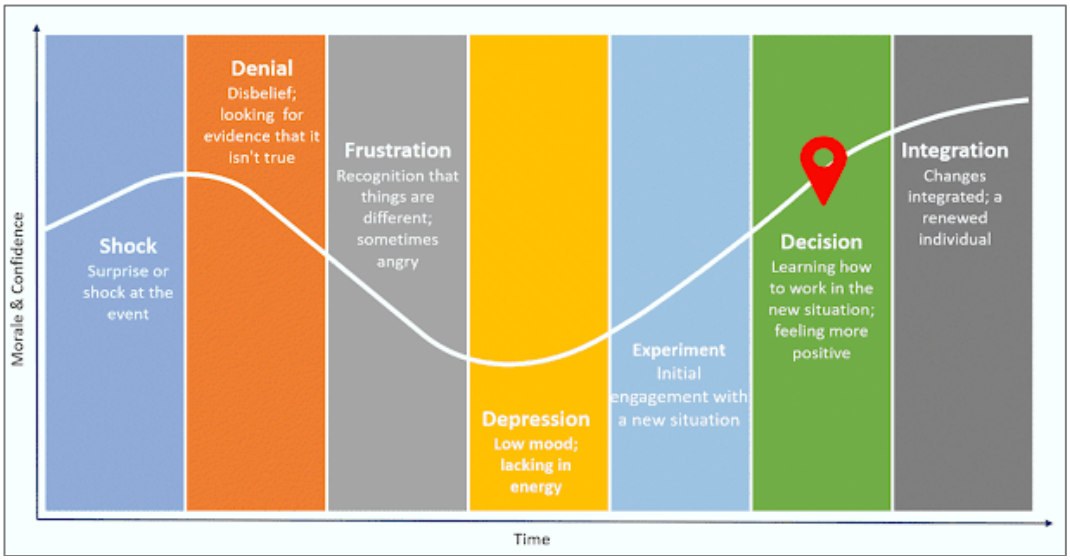


Figure 3. Kubler Ross . Curve of Change

The Kubler Ross cycle was originally designed to describe the different emotional stages of individuals dealing with trauma, illness, and others but these cycles also have similarities with sequences of the circumstances in which individuals cope with and adapt to change (Mcguire et al., 2007). BRIN management needs to shorten the time it takes for the curve to start increasing with the learning process of each individual so that cultural integration can occur. In addition, the change management program can anticipate the depth of the impact of the change. Deeper levels of frustration and depression can impact individual and overall organizational performance.

Opportunity Analysis

(Mercan & Göktaş, 2011) conceptualizes an innovation ecosystem through three components: (1) a network of interconnected actors (companies, suppliers, institutions, etc.) in a particular service or industry. (2) University and industry collaboration in research and development increases innovation output. (3) Innovative culture and skilled and educated workforce which are expected to foster innovative activities. Therefore, collaboration with universities, industry, and other stakeholders is a great opportunity for BRIN to produce research and innovations that are nationally competitive. The availability of various sources of funding options such as grants, loans, and others -both domestic and abroad- is an opportunity that must be used as well as possible by BRIN researchers. In addition, in accordance with President Jokowi's work program, the first priority is the development of human resources. BRIN will conduct a research-based learning scholarship program adopting the previous LIPI program and post-doc program through the provision of incentives and research collaboration.

Threats Analysis

Research management policies greatly influence research results. For example, in applying for a patent which takes years for the acceptance process due to complicated bureaucracy, in addition, some research funding will only be disbursed in the middle of the year while the report must be ready by the end of

the year. In addition, there is also a decrease in the level of public trust in research results that are not used properly because they cannot be used massively. Offers from the private sector and abroad are also a threat that needs to be considered because their funds are quite large and there is no complicated bureaucracy. In addition, the government's policy regarding budget refocusing for the COVID-19 response is also a threat because the research budget is reduced but research targets must still be achieved.

IFAS and EFAS scores

Respondents were then asked to give weights and ratings for the mapping results. The results are IFAS and EFAS scores as can be seen in Tables 2 and 3 below. The total column is derived from the number of answers of all respondents with each indicator, the weight column is done by dividing the number of respondents' answers to each indicator by the total IFAS/EFAS, the rating column is obtained by dividing the number of respondents' answers to each indicator by the total respondents, and the last column is the multiplication of Weight by Rating.

Table 2
Strategic Internal Factor Analysis

No.	Internal Strategy Factors	Total	Weight	Rating	Weight x Rating
	Strength				
1	Bigger and centralized budget	93	0,11	2,91	0,31
2	Easy coordination and collaboration because research institutes have been integrated	89	0,10	2,78	0,28
3	Facilitate research because there is a lot of expertise	97	0,11	3,03	0,34
4	Availability of adequate research facilities and infrastructure	92	0,11	2,88	0,30
5	Shorter bureaucracy	82	0,09	2,56	0,24
	Strength score	**453**	**0,52**	**14,16**	**1,47**
	Weakness				
1	There is a sectoral ego	79	0,09	2,47	0,22
2	There is a perception that one research group must be better than other groups (competition instead of collaboration)	81	0,09	2,53	0,23
3	It takes time to unite vision and mission	91	0,10	2,84	0,30
4	There are still non-research workloads (structural and administrative)	87	0,10	2,72	0,27
5	There are still non-research workloads (structural and administrative)	85	0,10	2,66	0,26
	Weakness Score	**423**	**0,48**	**13,22**	**1,28**
IFAS Score		**876**	**1.00**	**27,38**	**2,75**

Source: Primary data results, 2021

The table above illustrates that the total strength score is 1.47 with the largest score, which is easy in research because there is a lot of expertise. In a study by (Sauer et al., 2017) , the Chinese Academy of Sciences (CAS) launched a road map for the development of science and technology until 2050, in order to avoid overlapping, about 60 CAS members and more than 80 CAS institutes in the field of science, technology, management and public administration are involved and participate, it is hoped that China will be ready in the new technological and industrial revolution for China's Modernization and the realization of a prosperous society. BRIN was also established to eliminate overlaps in research and with the integration of various kinds of expertise, it is hoped that research and innovation results will be created and have high competitiveness both nationally and internationally. The total weakness score is 1.28 with the largest score of the need for time to unite the same vision and mission. It is undeniable that the unification of various research institutions takes time to unify the vision and mission, so the management must be intense in providing direction so that the vision and mission that have been declared will be achieved. The overall IFAS score is 2.75, meaning that strengths are greater than weaknesses.

Table 3
Strategic External Factor Analysis

No.	External Strategy Factors	Total	Weight	Rating	Weight x Rating
	Opportunity				
1	Expansion of the area and object of R&D activities (research, development, assessment and application)	98	0,11	3,06	0,34
2	More and more new funding options (grants, loans, etc.)	90	0,10	2,81	0,29
3	Research collaboration with industry and other stakeholders	90	0,11	2,81	0,29
4	Research-based scholarship programs and Post Doc programs through the provision of incentives and research collaborations	106	0,12	3,31	0,40
5	The need for national production competitiveness	85	0,10	2,66	0,26
	Opportunity Score	**453**	**0,52**	**14,16**	**1,58**
	Threat Score				
1	The impartiality of government policies towards research culture	75	0,09	2,34	0,20
2	Decrease in the level of public confidence in research results	85	0,10	2,66	0,26
3	There are job offers and facilities that are more attractive from the private sector and abroad	90	0,10	2,81	0,29
4	Moratorium on recruitment of research personnel	77	0,09	2,41	0,21
5	Refocusing the budget to handle COVID-19	81	0,09	2,53	0,23

Threat score	**408**	**0,47**	**12,75**	**1,19**
EFAS Score	**877**	**1.00**	**27,41**	**2,77**

Source: Primary data results, 2021

The table above describes an Opportunity score of 1.58 with the highest score from the research-based learning scholarship program and the Post Doc program through the provision of incentives and research collaboration. In research by (Lembani et al., 2016), to strengthen human capacity, adequate strategies are needed such as research seminars, conferences, scholarships, internships, research grants, partnerships, short course training and writing & publication support. Improving quality and competitive human resources is one of the National Priority agendas in the 2020-2024 RPJMN. Because HR plays an important role in the implementation of research and innovation, it is paramount to establish good cooperation with domestic and foreign universities in terms of scholarship programs and research collaborations. Threat score (threat) of 1.19 with the largest score from the existence of job offers and more attractive facilities from private and foreign parties. According to research conducted by (Aarnikoivu, Melina;Nokkala, Terhi; Siekkinen, Taru; Kuoppala, Kari; Pekkola, 2019), the majority of researchers choose to leave their jobs due to dissatisfaction and stress such as dissatisfaction with work, institutions, lack of career development and other factors. Whereas according to (Zhang et al., 2020), high job demands and lack of resources such as lack of organizational support, colleagues, and reward systems have a low level of job satisfaction and the tendency to leave the organization. The overall EFAS score of 2.77 means that the opportunities are greater than the threats.

When compared between the IFAS Score (2.75) and EFAS Score (2.77), the results show that the external factors of the organization are greater than the internal factors of the organization, although the values are not much different. For this reason, the organization must carry out a strategy by taking into account both internal and external factors.

The results of IFAS and EFAS according to (Bremer et al., 2012) can be described in the form of a quadrant. The results in Quadrant 1 describe this relationship situation to create an SO (Strengths-Opportunities) strategy in the form of supporting an aggressive strategy. In Quadrant II (Strengths-Threats), the strategy that is built must take advantage of every strength to deal with threats, for example through diversification to create opportunities (diversification strategy). In quadrant III (Weaknesses-Opportunities), the developed strategy aims to minimize internal problems, to capture better market opportunities (turnaround strategy). Finally, in Quadrant IV (Weaknesses-Threats) with strategies to minimize existing weaknesses to overcome threats (defensive strategies).

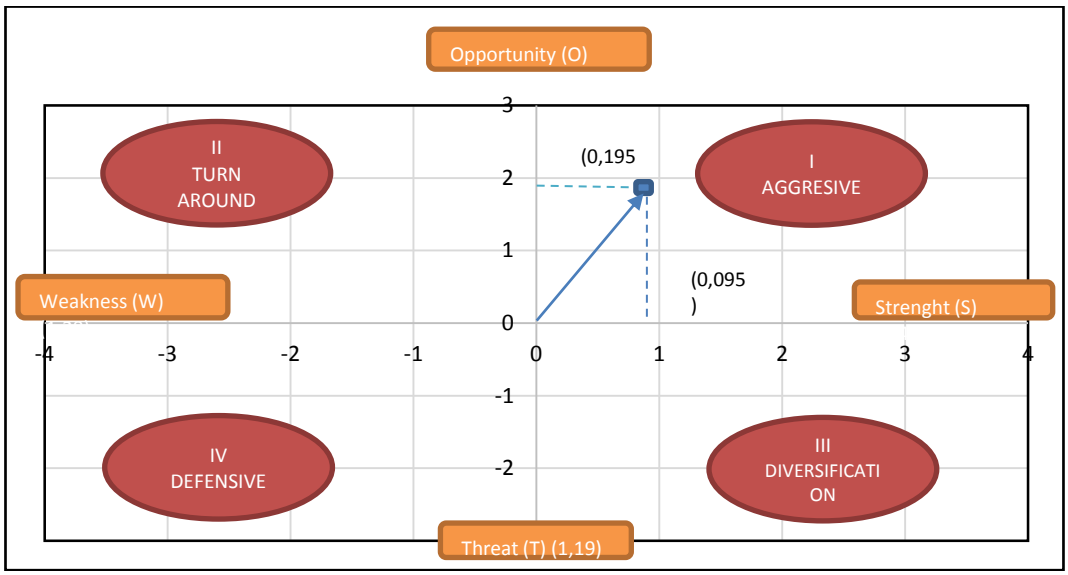


Figure 4 – Mapping of IFAS and EFAS in Quadrant
Source: Research primary data, 2021

Figure 4 above shows that the research and innovation development plan at BRIN is in quadrant 1. With reference to an aggressive strategy, namely using existing strengths by taking advantage of opportunities that arise. The strategies are:

1. A large budget, adequate research facilities and infrastructure will result in a wider area and object of research and development activities. According to (Marchino et al., 2021), collaboration and integration of various skills and expertise is very important. Meanwhile, according to (Gao et al., 2021), with a wider and open innovation collaboration, connected and integrated into a larger science and technology organization, collaborative governance of internal and external cooperation will result in a healthy, cooperative, organized and open innovation ecosystem. Meanwhile, according to (Pucciarelli & Kaplan, 2016), the existence of facilities and infrastructure such as the digital environment will improve research results due to the existence of online resources and scientific databases that can produce research becomes faster and more efficient and accessible to users.

1. Coordination and collaboration in the field of expertise with universities, industry and other stakeholders by utilizing the competitiveness of national production needs to encourage an innovation ecosystem. In the context of handling the Covid-19 pandemic, according to the BRIN press release No. 010/SP/HM/BKPUK/1/2022, BRIN in collaboration with Industry (PT Biosains Medika Indonesia) produced research, namely the reverse transcription loop mediated isothermal amplification (RT LAMP) method. This method is used to be able to more quickly detect Covid-19 and facilitate handling (Nasional, n.d.). In addition, BRIN and Telkom University are also collaborating to develop metaverse technology (Ayunda Pininta Kasih, 2022).
2. Improving the quality of science and technology human resources through the implementation of research collaboration incentives. Improving the quality of

science and technology human resources is very important because based on the 2021 Global Innovation Index data, Indonesia is in 87th position out of 132 countries (Soumitra et al., 2021). BRIN has developed a talent management program, namely the research assistant program, which is a research activity mentoring program based on R&D collaboration for active students from undergraduate to postgraduate degrees to support the research and innovation ecosystem. In addition, there is a postdoctoral program, namely a research mobility program based on R&D collaboration for Indonesian citizens or foreigners who have just completed their doctoral education. Other talent management programs are the visiting researcher program, which is a research collaboration program between BRIN researchers and practitioners at universities or industries who are experienced in their fields of expertise and the BARISTA (Research and Innovation Talent Research Assistance) program, which is tuition and research assistance to final year students based on research collaboration in the BRIN environmental work unit (*Manajemen Talenta*, 2022).

Although the strategy is aggressive in SO (Strengths-Opportunities), but in ST (Strengths-Threats), WO (Weaknesses-Opportunities), and WT (Weaknesses-Threats) relationships, strategies are still needed so that the organization achieves maximum results. The strategy for ST is in the form of: 1) Provision of budget and infrastructure and administrative lines that are not complicated are the choices of employees to continue working in their agencies. According to BRIN press release No. 014/SP/HM/BKPUK/I/2022, the BRIN budget which is in the research center has been allocated only for research needs while the operational budget is in the Main Secretariat, different from the previous entities (LIPI, BATAN, BPPT, LAPAN) where each center research has a mixed budget with operational costs (Nasional, 2022); 2) Recruitment of human resources in science and technology through PPPK (government employees with work agreements) with high qualifications (S3) on a massive scale. BRIN opened the selection of candidates for state civil apparatus (CASN) and PPPK in 2021 as many as 325 formations which were divided into 221 CASN formations; and 104 PPPK formations. Doctoral qualifications are required so that researchers can compete globally (Suranto, 2021). 3) Formation of new functional positions related to research. As a supervisory agency, BRIN coordinates 11 functional positions consisting of Researchers, Engineers, Nuclear Technology Developers, Analysts for the use of Science and Technology, Scientific data analysts, Plantations Analysts, curator of biological collections, scientific publishing stylists, research and engineering technicians and plantation technicians (BRIN, 2021). The strategies for WO are: 1) Continuous socialization related to tasks and opportunities that can be obtained from the leadership to employees. Socialization has been continuously carried out by the Head of BRIN since 4 research institutions officially joined on September 1, 2021, namely the morning assembly which is held every Monday. After the assembly, the Head of BRIN provides important information related to BRIN so that the vision and mission to be achieved can be conveyed and implemented by ASN at BRIN; 2) Rewards and

punishments so that employees are more focused on improving their performance. Regarding reward and punishment, it can be adopted from the Indonesian Institute of Sciences (LIPI) because as a supervisory agency for functional research positions listed in the *Peraturan Kepala LIPI Nomor 20 Tahun 2019* concerning technical instructions for functional research positions, namely in addition to assessments in credit scores, there is also HKM (minimum work results), namely the abilities required to be able to carry out certain jobs in research activities involving aspects of knowledge, skills and behavior that are relevant to the tasks and requirements researcher functional position. For example, for the main position of KKM 1 with one of the achievements, namely scientific papers published in global indexed scientific journals, if that is not achieved, they will suffer punishment, namely reduced performance allowances; 3) Development of a positive and constructive work environment. One of them is the idea of a coworking space, where researchers can choose laboratories spread across Indonesia according to the needs of the research being carried out so that innovation is better. Coworking has proven to be a novel approach to flexible working arrangements and knowledge exchange (Parrino, 2015). Coworking spacr will increase participation in learning and increased interaction between researcher to produce the exchange of experience and information (Orel & Bennis, 2020). The strategies for WT are: 1) Redistribution of employees based on competence, position and personal preferences. In accordance with the press release of BRIN No. 122/SP/HM/BKPUK/IX/2021, BRIN will organize and map human resources through the BRIN HR Mapping Information System (Biro Komunikasi Publik, Umum & Nasional, 2021). 2) Simplification of research regulations; and 3) Preparation of long-term research funding scheme plans. As the only research institution in Indonesia, BRIN established a collaborative scheme program involving the government, academia and industry (private sector) called the Research Collaboration Center. This program will be carried out with funding in the form of a multi-year contract (3-7 years) which will be evaluated annually to establish large-scale collaboration with clear, measurable and long-term targets.

In research conducted (Putera et al., 2013), R & D organizations tend to be results-oriented with lean organizational structures, not bureaucratic and flexible. Furthermore, the research conducted by (Jannah, 2013b) on discovering the rapid progress of institutional research, there are several factors that hinder performance in R & D institutions including research budgets, resources, facilities and infrastructure, the performance and policies of R & D institutions where they work still stand alone and limited cross collaboration among the institutions. This article analyzes and focus on the transformation readiness of the National Research and Innovation Agency to accelerate the development of national research by implementing the new structure as single research entity resulting from 4 main institution merger (LIPI, LAPAN, BATAN, BPPT). This new institutions called as BRIN (Badan Riset and Inovasi Nasional)/ the National Research and Innovation Agency.

D. CONCLUSION

BRIN's position, which has great strengths and opportunities, and has implemented several anticipations in dealing with internal weaknesses and external threats, can be an achievement of the tasks and functions carried out by BRIN. The process of strengthening resources and exploiting opportunities as well as overcoming weaknesses and threats is continuously carried out so that BRIN is able to mold an organization with a bureaucracy that is agile, simple, dynamic, and adaptive to changes. In addition to not only encouraging research collaboration, BRIN also strengthens the development of science and technology human resources, in accordance with the first priority in President Jokowi's work program, the large number of science and technology human resources will further encourage research activities such as research-based master and doctoral education programs in partnership with domestic and foreign universities. Various R&D infrastructures and adequate remuneration to be attractive need to be arranged not only for the best graduates in Indonesia but also for the diaspora to return to work and contribute in Indonesia. The change management program is critical to ensure that the transformation process at BRIN by incorporating various R&D institutions into BRIN can be communicated to all stakeholders so that this change can be accepted, understood and implemented to achieve the vision and mission of BRIN. Finally, cooperation and collaboration are also easier because there are no barriers between institutions and the contribution of the private sector is needed in the development of research and innovation, namely the development of technology-based products so that research and innovation results can compete globally.

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