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Risk Analysis and Its Treatment Alternatives on Bilateral Grants South Korea-Indonesia During COVID-19 Pandemic Period

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***Abstract*—** As a consequence of the Covid-19 pandemic, there has been a momentary adjustment in the bilateral development grant management funded by the South Korean government for Indonesia including a priority shift of the sector, restrictions on project implementation, and project schedule adjustment. This study analyzes the risk context and level during the Covid-19 pandemic and finds alternatives to deal with high-level risk indicators from the perspective of project owners, project implementers, and project users. This research method is quantitative concerning the risk management framework of AS/NZS 4360:2004 by applying the Analytical Hierarchy Process method and severity index scale. The research respondents were 46 people consisting of managers in project owner organizations, teams of project implementing organizations, and representatives of project user organizations. The result shows that the high priority of risk indicators implies each technical, operational, strategic, and security and safety criteria, and 5 high levels of risks have been discovered consisting of budget availability, project punctuality, stakeholder commitment, government handling policies related to Covid-19, and the spread of the Covid-19 virus and its variants. Those high-level risk indicators are further analyzed to identify alternatives to control the risk.

***Keywords*—** Covid-19, risk management, development grant, bilateral cooperation, intergovernmental relation.

I. INTRODUCTION

Since the report of the first case of Covid-19 virus infection on March 2, 2020, Indonesia has continued to report the development of new cases of coronavirus infection to date and has taken many strategic steps to tackle the spread of the virus. (Farisa, 2021). As reported from the government's official website (Ministry of Health, 2021)regarding the spread of Covid-19 in Indonesia, Indonesia currently continues to experience an increase in confirmed cases of Covid-19, although, from the number of cases, many patients have recovered along with the discovery of the vaccine for COVID-19.

With the current situation, governments from donor countries have widely disseminated emergency messages, including warnings for experts from the respective countries who have come to Indonesia. This of course will hamper the progress of the project and have a major impact on existing bilateral projects in Indonesia. USAID through its website always updates the current situation in Indonesia and provides security and safety alerts for its citizens both from outside Indonesia and within Indonesia. A warning will appear when the situation in Indonesia is considered to threaten the safety and security of its citizens, this generally applies to American experts in Indonesia and abroad who will come to Indonesia (US Embassy Jakarta, 2021).

South Korean government, through Korea International Cooperation Agency (KOICA) has also adjusted the project management strategy on the bilateral grants. Currently, (Koica, 2021)there are 10 ongoing projects and newly selected projects before the 2020 pandemic. 2 new projects are devoted to supporting the Indonesian government in tackling the Covid-19 virus outbreak. The projects are classified into small projects with a total of 9 institution recipients. In the higher education sector, there are 2 projects whose studies were temporarily postponed and for more than one year, the implementation survey was carried out virtually. 2 projects were temporarily suspended in the transportation sector, and 2 projects were implemented virtually for projects in the digital partnership sector. Not only South Korea funded grants, but amid this situation, other grants from many international partner organizations have changed their strategies and policies. On the one hand, taking action to reduce or postpone project implementation, restrict projects, and even reallocate or increase the number of projects related to the humanitarian crisis.

This situation has given a lot of risks to the project. This is the background of research on risk management in the

grants funded by the South Korean government in Indonesia. This study aims to analyze risk issues in the bilateral development project during the Covid-19 pandemic which is still ongoing and entering its second year. This study is intended to: 1) Establish the context of internal and external risks; 2) Analyze the level of risk that arises in project management; 3) Analyze risk treatment alternatives that can be offered to anticipate risks in international grant projects during the Covid-19 pandemic.

The study analysis applies risk management standard AS/NZS 4360:200, which has offered applicable for any organization and enterprise in varied sector. At each step in the AS/NZS 4360:2004 risk management, there are many techniques offered (Budihardjo et al., 2019; Chen, 2018; Nugroho & Iskandar, 2020; D. P. Sari et al., 2017; Sutoyo & Dewi Nusraningrum, 2020). Furthermore, the study explains that it is necessary to ascertain the risk context before examining further risk assessment and evaluation. There are many techniques for measuring the risk context as well as for conducting a risk assessment. This study uses the Analytical Hierarchy Process (AHP) to examine the context and risk treatment, while the severity index is used for risk assessment and evaluation. Each risk management standard and technique has its advantages and in practice, it can be used in combination with one another (Olechowski et al., 2016; E. M. Sari et al., 2020). The other study also shows that many methods can be applied to manage the multiple dimensions of risk to assist managers in identifying, prioritizing, analyzing, and helping to manage risk (Chen, 2018; Dandage et al., 2018; Olechowski et al., 2016; D. P. Sari et al., 2017).

This research method is descriptive and quantitative by distributing questionnaires to policymakers of development grant projects consisting of the project owner, project implementer, and project end-user. Questionnaires regarding the establishment of internal and external contexts and questionnaires for handling high-level risks were distributed only to project owners, while questionnaires regarding risk assessment were distributed to the three stakeholder groups. To establish the risk context applies the Analytical Hierarchy Process (AHP) (Azizah & Yustanti, 2019; Banda, 2019; Nugroho & Iskandar, 2020; Nusraningrum & Priyono, 2018; Sutoyo & Dewi Nusraningrum, 2020; Vargas, 2010), and the risk assessment was carried out using the severity index.

This study explores how the risk context is recognized and how the analysis of risk is carried out on bilateral development grants during the Covid-19 pandemic. The study is conducted to answer the priority of risk indicators in the internal and external context of project management, analyze the level of risk that arises, and identify alternative treatments for high-risk levels.

II. LITERATURE REVIEW

Currently, 30 countries have provided the international grant assistance (Official Development Assistance) and become the OECD Development Assistance Committee (DAC) members as of December 2021 (OECD, 2021). Those donor countries have different governance of aid assistance either financial scheme or aid management (OECD, 2015). Some countries manage government assistance directly under the coordination of the ministry of foreign affairs or have a special aid management agency formed outside the ministry of foreign affairs (Gulrajani, 2015).

In practice, foreign aid is often strong-minded by the donor country compared to the call of the beneficiary country (Qian, 2015)and is considered a policy-making tool and an economic benchmark in many sectors including politics, economic development, governance, and democracy (Taffet, 2012). Although the data displayed in the aggregate is judged to have measurement and identification differences due to the heterogeneous nature of the assistance (Qian, 2015).

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Project Management

Project management is correlated with operations management. In some kinds of literature, it is explained that operation management includes all activities needed to make goods and services (Sutawidjaya et al., 2019). In other literature, project management is recognized as application of knowledge, skills, tools, and techniques, which is reflected through project activities to meet project demands (Project Management Institute, 2017).

In organizations that are engaged in the service sector, including state bilateral cooperation management institutions, of course, in managing grant aid, the government needs to implement operations management in practice (Dang et al., 2020; Gulrajani, 2015; Hwang & Song, 2019; Taffet, 2012). (Khameneh et al., 2016) conducted a study on the project risk management framework. The study identifies the key indicators of the risk management and offers an outline for evaluating the project risk control.

Some practitioners and researchers associate project management with the achievement of the objective function. But in fact, the project management approach focuses on cost, schedule, and quality (Nusraningrum & Priyono, 2018)and can be integrated with management in other scopes (Sutawidjaya & Nawangsari, 2020). Many professionals tend to associate project success by 3 factors: as schedule, within budget, and of good/standardized quality (Apriyanto & Putro, 2018).

Other researchers (Meredith & Zwikael, 2019) group the project criteria into 3 groups, namely project management, project ownership management, and project investment management. Therefore, the criteria for measuring a project's success or failure can be seen based on these 3 groups. Project management success (PMS) appraises the project manager's realization of project plans (timetable, cost, and quality targets), whereas project ownership success (POS) and project investment success (PIS) capture the added value created from the project.

Risk Management

Many studies have investigated risk management. The word risk itself is a word that invites different opinions among experts. The study of risk definition has been reviewed in a study (Flage & Aven, 2015)which discusses the definition of emergent risk and emerging risk. Emergent risk is seen as a possibility that can pose a potential danger or threat that is uncertain, cannot be assessed, and cannot be managed using a management approach.

Meanwhile, the emerging risk is considered a possibility that appears and has a certain impact at a certain time and situation. Both, the emergent risk and emerging risk in this study will be seen in general as the risks that could threaten the project management from the perspective of executives, managers, actors, and users.

Additionally, risk management practices allow executives and managers to accelerate decision-making (Dang et al., 2020). There are many risks identified when an organization will enter a country and start cooperating. The risk will increase as the project starts to run and interact with many officials from various organizations. The study (Dang et al., 2020) states that the government is in control of maintaining a relationship or active mediation in the success of a collaboration.

(Meredith & Zwikael, 2019) presents a model of stakeholders involved in dynamic projects, especially projects in non-profit organizations. The study stated that the main project stakeholder in the organization is the project owner. The project owner role places more emphasis on strategic interests and decisions than on the importance of project execution based on time, schedule, and quality. The project owner is more concerned with strategic matters, for example, that the cooperation will enhance the partnership between the two countries in the field of economic development and strengthen the friendship between the two countries. In the study, the role of the project owner is visualized in Figure 2.1 below.

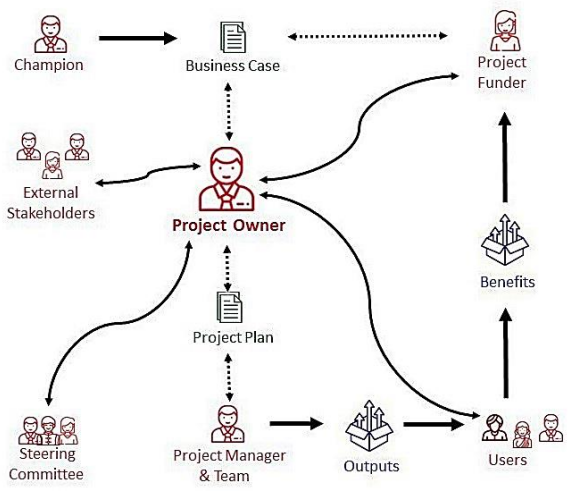

Figure 2.1: *Project owner's role*
Source: (Meredith & Zwikael, 2019)

In bilateral development cooperation, the project owner is the project management agency that assists in the process of creating the project together with stakeholders from the project recipient country. There are many stakeholders involved in the project as described in figure 2.1 The study highlights 3 groups of stakeholders namely the project owner, project implementer, and end-user. The stakeholder in

champions is generally the same as the end-user of the project. The stakeholders on the steering committee usually consist of joint stakeholders or representatives from the project owner (mandated by the project funder), the project manager and team, and the project user. (Meredith & Zwikael, 2019; Zwikael et al., 2019)

III. METHODS

The Australia/New Zealand risk management standard 4360:2004 are referred in the study to define clearly the steps of risk management framework as described in figure 2.2 below:

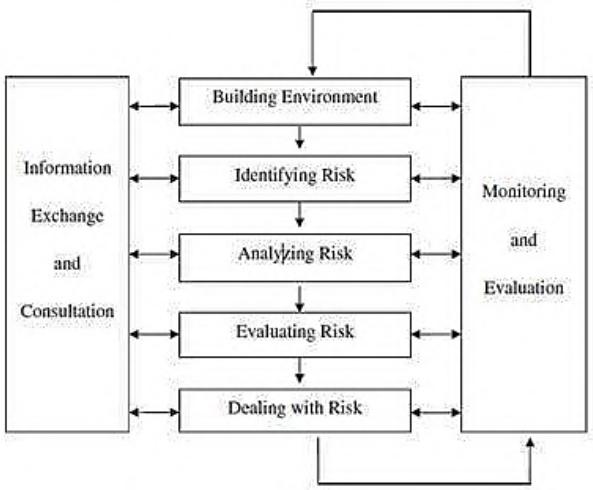

Figure 2.2: *Risk Management Standard AS/NZS 4360:2004*
Source: (AS/NZS, 2004)

As the aid to apply the risk standard method, application of Analytical Hierarchy Process and the Severity Index scale are being used to explore the assessment and evaluation of risk context, criteria, and indicators.

Analytical Hierarchy Process (AHP)

The Analytical Hierarchy Process (AHP) is widely used as a reference by professionals and practitioners for formulating decisions (Debataraja et al., 2020; Sutoyo & Dewi Nusraningrum, 2020). The study (Nugroho & Iskandar, 2020) shows that the AHP tool is utilized to find the consistency and structure of the identified risk factors. On the other hand, AHP can be widely used in decision-making settings such as choices and priorities, finding alternative, selecting third party company, and dispute resolution. AHP is also used to identify dominant indicators and determine alternative risk decision (Azizah & Yustanti, 2019; Forman & Gass, 2001; Syahriadi, 2020) so that it becomes easier to analyze and compare independently.

Comparing two components using AHP can be implemented in various ways. However, the scale of relative importance between those two elements is the most widely used (the Saaty scale) by associating a value that varies from 1 to 9. The scale exposes the relative importance of an alternative when compared to other alternatives, as we can see in the following table:

Tabel 2.1: *Numerical and Reciprocal Score on Saaty Relative Importance Scale*

Scale	Numerical Rating	Reciprocal
Extremely Preferred	9	1/9
Very strong to extremely	8	1/8
Very strongly preferred	7	1/7
Strongly to very strongly	6	1/6
Strongly preferred	5	1/5
Moderately to strongly	4	¼
Moderately preferred	3	1/3
Equally to moderately	2	½
Equally preferred	1	1

Source: (Husin et al., 2019; Vargas, 2010)

Severity Index Using Likert Scale

The severity index is used to assess the severity of the risk which is calculated from the severity index of probability and impact. Meanwhile, to assess the level of risk is obtained by multiplying the weight of the value of the probability SI result and the impact SI result. The Likert scale is widely used by researchers to do risk assessment and analysis using 5 Likert scales (Joshi et al., 2015) with the details described by (Nurudin & Huda, 2020).

The formula used for the Severity Index method is:

$$SI = \frac{\sum_{i=0}^{4} ai, xi}{4 \sum_{-}^{4} xi}$$

This study is using purposive sampling technique, a non-random technique that does not require an underlying theory or justification for determining the number of samples (Etikan, 2016). The sample is selected based on the inclusion and exclusion criteria determined by the researcher.

With these criteria, this study includes 11 projects with different project situations due to the Covid-19 pandemic. Around 46 respondents are classified into 3 groups of respondents, consisting of the project owner, the project implementer, and the project user team. The method of data collection in this research is by distributing questionnaires. The questionnaire in this study was developed from 16 indicators which were distributed directly through google forms and papers. The data result was processed using the AHP method with the aid of Expert Choice 11 software, while the severity index was calculated using Microsoft Excel.

IV. RESULTS

Prioritizing the Project Risk Context

The result of the study has identified 16 risk indicators which were grouped into 4 criteria, namely technical, operational, strategic, and security and safety criteria. Those indicators are further valued and prioritized. Below is the visualization of the risk analysis in this study:

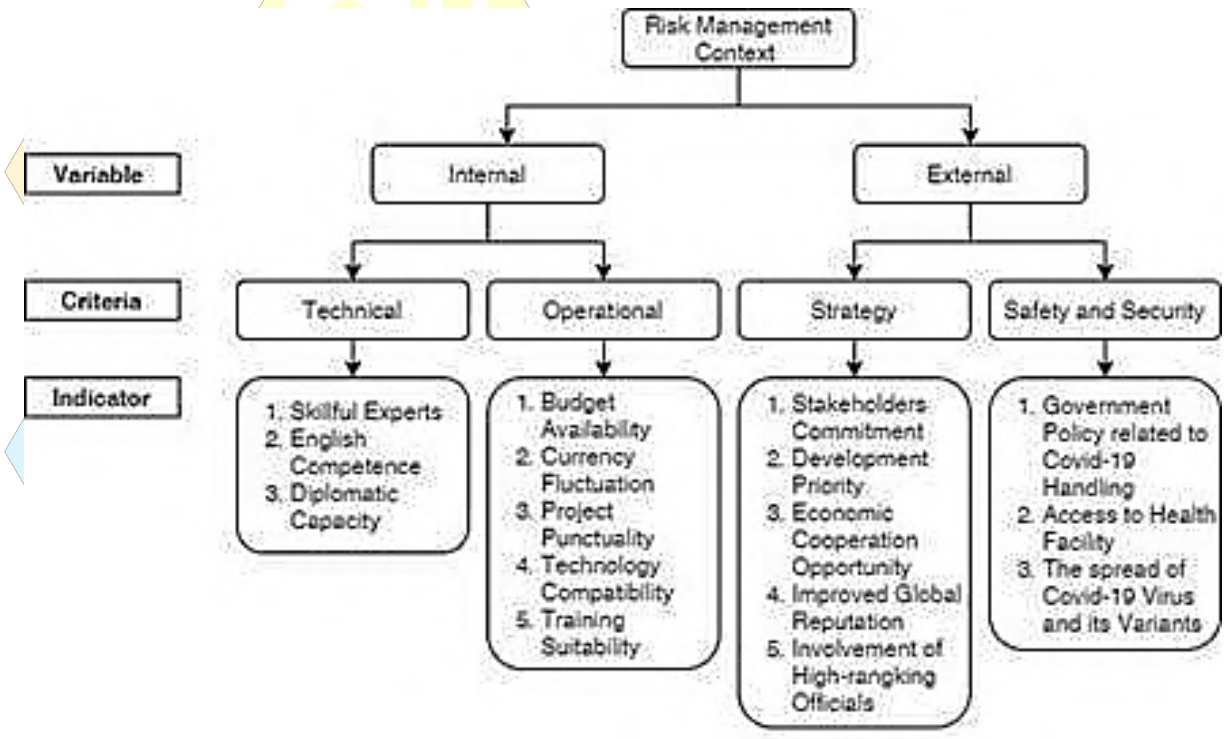

Figure 2.3: *Risk variable, criteria, and indicators of the study*

The researcher divides the risk context into two variables, namely internal and external. Each is consisting of two criteria. In internal variables, there are technical and operational criteria, while in external variables, there are strategic criteria and security and safety criteria. In the sub-criteria or technical indicators, the researcher includes three indicators that are considered affecting the smooth implementation of the project in the field. The risk indicators are written in a positive statement: 3 indicators under technical criteria, 5 indicators under operational criteria, 5 indicators under strategic criteria, and 3 indicators under security and safety criteria.

Comparison between Criteria

The results show that, in the internal context, operational criteria have a higher priority than technical criteria with a score of 0.507 while the technical criteria's score is 0.493. This shows that operational criteria are considered the highest criteria in the internal context that affect project risk (Figure 2.4):

Figure 2.4: *The Comparison result of Criteria of Internal and External Context*

Meanwhile, in the external context, security and safety criteria have a higher priority than strategic criteria with a score is 0.567 while the strategic criteria's score is 0.433. This shows that safety and security criteria are considered the highest criteria in the external context that affect project risk.

Comparison between Indicators from each Criterion

In the comparison of indicators or sub-criteria of technical, operational, strategic, and security and safety criteria, the researcher found that each criterion has its prioritized indicator as shown in the figure 2.5.

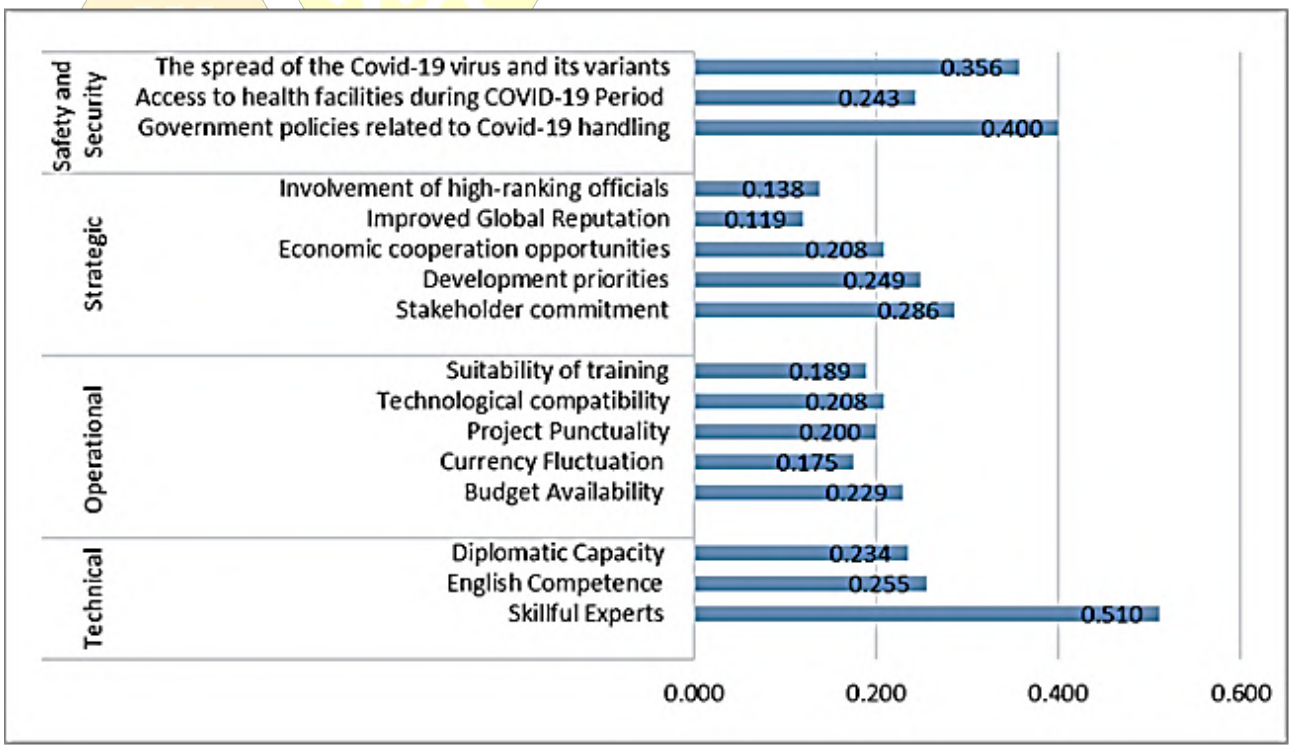

Figure 2.5: *Comparison result of indicators each criterion.*

On technical criteria, the highest score indicator is on the ability of skillful experts compared to the other two indicators with a score is 0.510 while the highest score in the operational criteria is found in the budget availability indicator, which is 0.229 and is followed by the technology suitability indicator, with a score of 0.208, as the second-highest ranking.

The stakeholder commitment indicator in the strategic criteria is positioned as a high priority compared to the other 4 indicators, with the highest score of 0.286 and the lowest score (the fifth) of 0.119 on the global reputation improvement indicator. In the safety and security criteria, government policy indicators related to handling Covid-19 are the highest priority risk indicator with a value of 0.400 followed by the spread of the

Covid-19 virus and its variants with a value of 0.356, as the second-highest indicator.

From the study results, it can be identified that the high priority risk occurred in each criterion, namely the skillful experts, budget availability, stakeholder commitment, and government policies related to handling Covid-19.

Risk Assessment and Analysis

After knowing the indicator priority of each criterion, the researcher tries to re-analyze these indicators from a broader perspective. Risk analysis is assessed using a Likert scale of 1 to 5 to calculate risk probability and its impact. It is aimed to calculate the probability and the impact of the severity index (SI).

It is used to assess the severity of the risk from the perspective of the probability and impact. When the SI value/score of Probability and Impact has been obtained, each SI value is then to be categorized using the index rating scale (table 2.2) and its result from the SI of probability is then multiplied with the SI value of Impact. The multiplication of SI value of Probability and Impact is proposed to determine the level of risk whether it is classified as high, medium, or low risk (categorized into 5 scale based on the rating scale shown in the table 2.2). The researcher then chooses the risk level which is categorized as high risk (or intolerable risk, based on the risk scoring matrix as shown in the table 2.6). Subsequently, five alternative treatments for the selected high risks are chosen and assessed by utilizing the AHP with the aid of expert choice 11 software, which is explained in the chapter of risk treatment/handling in this journal.

The Severity index value for Probability (P) and impact (I) is calculated using the SI formula as described in formula 4.1 and formula 4.2 with a sample of calculation as referred to in the question of risk indicator 1 (P1) in the table….:

$$SI\ (P) = \frac{((0\ x\ 8)+(1x9)+(2x11)+(3x15)+(4x3))}{4\ x\ (8+9+11+15+3)} = \frac{(88)}{(184)} = 0{,}478 = 0{,}48 \quad \ldots\ldots\ldots\ldots (4.1)$$

While the sample of the calculation of the SI of impact value as referred to the question of risk indicator 1 (P1) in the table….:

$$SI\ (I) = \frac{((0\ x\ 7)+(1x5)+(2x9)+(3x18)+(4x7))}{4\ x\ (7+5+9+18+7)} = \frac{(105)}{(184)} = 0{,}57 \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.2)$$

The Severity Index results are then calculated on each indicator as shown in Table 4.7 and Table 4.8 in detail for the probability index value scale and the impact index value by referring to the index rating scale in Table 4.4

Table 2.2*: Probability and impact index rating scale*

Likert scale	Level	Value
1	Very low	$0 \leq w < 0{,}2$
2	Low	$0{,}2 \leq w < 0{,}4$
3	Medium	$0{,}4 \leq w < 0{,}6$
4	High	$0{,}6 \leq w < 0{,}8$
5	Very high	$0{,}8 \leq w \leq 1$

Source: Banda, 2018

By referring to the probability and impact index rating scale above, then the data is calculated using the severity index calculation formula for probability and impact as shown in table 2.3 and table 2.4

Tabel 2.3: *Severity index (SI) value for Probability*

Questions	Risk Indicators	SI value	%	Weight	Category
P1	Skillful Experts	0,48	48%	3	Medium
P2	English Competence	0,49	49%	3	Medium
P3	Diplomatic Capacity	0,47	47%	3	Medium
P4	Budget Availability	0,63	63%	4	High
P5	Currency Fluctuation	0,46	46%	3	Medium
P6	Project Punctuality	0,70	70%	4	High
P7	Technological compatibility	0,53	53%	3	Medium
P8	Suitability of training	0,53	53%	3	Medium
P9	Stakeholder commitment	0,64	64%	4	High
P10	Development priorities	0,52	52%	3	Medium
P11	Economic cooperation opportunities	0,51	51%	3	Medium
P12	Improved Global Reputation	0,44	44%	3	Medium
P13	Involvement of high-ranking officials	0,57	57%	3	Medium
P14	Government policies related to Covid-19 handling	0,69	69%	4	High
P15	Access to health facilities during COVID-19 Period	0,59	59%	3	Medium
P16	The spread of the Covid-19 virus and its variants	0,69	69%	4	High

Table 2.4: *Severity index (SI) Value for Impact*

Questions	Risk Indicators	Scale	%	Weight	Category
P1	Skillful Experts	0,57	57%	3	Medium
P2	English Competence	0,51	51%	3	Medium
P3	Diplomatic Capacity	0,54	54%	3	Medium
P4	Budget Availability	0,70	70%	4	High
P5	Currency Fluctuation	0,51	51%	3	Medium
P6	Project Punctuality	0,68	68%	4	High
P7	Technological compatibility	0,58	58%	3	Medium
P8	Suitability of training	0,60	60%	3	Medium
P9	Stakeholder commitment	0,71	71%	4	High
P10	Development priorities	0,57	57%	3	Medium
P11	Economic cooperation opportunities	0,48	48%	3	Medium
P12	Improved Global Reputation	0,46	46%	3	Medium
P13	Involvement of high-ranking officials	0,64	64%	4	High
P14	Government policies related to Covid-19 handling	0,76	76%	4	High
P15	Access to health facilities during COVID-19 Period	0,70	70%	4	High
P16	The spread of the Covid-19 virus and its variants	0,77	77%	4	High

The table above shows that 5 risk indicators occur in a high category, which the value is >60%, namely Budget Availability, Project Punctuality, Stakeholder Commitment, Covid-19 Handling Policies, and the Spread of the Covid-19 Virus and its variants.

Meanwhile, the Severity index for large impacts is found in 7 risk indicators, namely: Budget Availability, Project Punctuality, Stakeholder Commitment, High Official Involvement, Government Policies related to Covid-19 Handling, Access to Health Facilities, and the Spread of the Covid-19 Virus and its variants.

After the severity index of probability and impact is obtained, the SI value of Probability (table 2.3) and SI value of Impact (table 2.4) is categorized using rating scale to get the weight of each SI scale. Then, its weight

is then multiplied by applying following formula to attain the level of risk as shown below:

$$Risk\ Level\ (R) = P\ X\ I$$ = 3 x 3 = 9

The following table is the value of the risk level and its classification based on the risk assessment matrix:

Table 2.5: *The Level of risk*

Questions	Risk Indicators	Probability weight (P)	Impact weight (I)	Risk level (R = PxI)	Risk classification
P1	Skillful Experts	3	3	9	Undesirable
P2	English Competence	3	3	9	Undesirable
P3	Diplomatic Capacity	3	3	9	Undesirable
P4	Budget Availability	4	4	16	Intolerable
P5	Currency Fluctuation	3	3	9	Undesirable
P6	Project Punctuality	4	4	16	Intolerable
P7	Technological compatibility	3	3	9	Undesirable
P8	Suitability of training	3	3	9	Undesirable
P9	Stakeholder commitment	4	4	16	Intolerable
P10	Development priorities	3	3	9	Undesirable
P11	Economic cooperation opportunities	3	3	9	Undesirable
P12	Improved Global Reputation	3	3	9	Undesirable
P13	Involvement of high-ranking officials	3	4	12	Undesirable
P14	Government policies related to Covid-19 handling	4	4	16	Intolerable
P15	Access to health facilities during COVID-19 Period	3	4	12	Undesirable
P16	The spread of the Covid-19 virus and its variants	4	4	16	Intolerable

Table 2.6: *Risk Scoring Matrix*

	Impact index					
Probability index	Very low (1)	Low (2)	Medium (3)	High (4)	Very high (5)	Risk classification
Very high (5)	5	10	15	20	25	Negligible (1-3)
high (4)	4	8	12	16	20	Tolerable (4-6)
medium (3)	3		9	12	15	Undesirable (8-12)
low (2)	2			8	10	Intolerable (15-25)
Very low (1)	1	2	3	4	5	

Source: (Banda, 2018)

From the results of the calculations above, the high level of risks is applied in 5 indicators, namely Budget Availability, Project Punctuality, Stakeholder Commitment, Government Policies related to Covid-19 Handling, and the Spread of the Covid-19 Virus and its variants with each risk level value is 16, which is categorized as intolerable risk based on risk scoring matrix (table 2.6).

Risk Treatment/Handling

After getting the results from the analysis of the risk level, the researcher then distributes the questionnaires to the project owner to find out and analyze the project owner's opinion regarding the handling of project risks during the period of the Covid-19. These risk-handling alternatives are considered very important (Giannakis & Papadopoulos, 2016; Iossa & Martimort, 2014)(Giannakis & Papadopoulos, 2016; Iossa & Martimort, 2015) especially during the force majeure period when all countries are experiencing great challenges during the high spread of the Covid-19 virus. This might affect how donor organizations make decisions regarding projects that take place during the Covid-19 period.

In this study, the researcher takes 5 indicators with a high level of risk (intolerable risk) as data to be processed to determine risk treatment. Five alternative

treatments are chosen, as alternatives that were taken by the organization as a form of prevention against the impact of greater risk. Those alternatives include: 1) Continue the project with restrictions; 2) Reallocate of budget to other sectors; 3) Reduce the number of projects; 4) Postpone the cooperation contract, and 5) discontinue the project. The determination of risk alternatives is then analyzed using the Analytical Hierarchy Process (AHP). The chart for determining project risk treatment could be seen in the following figure:

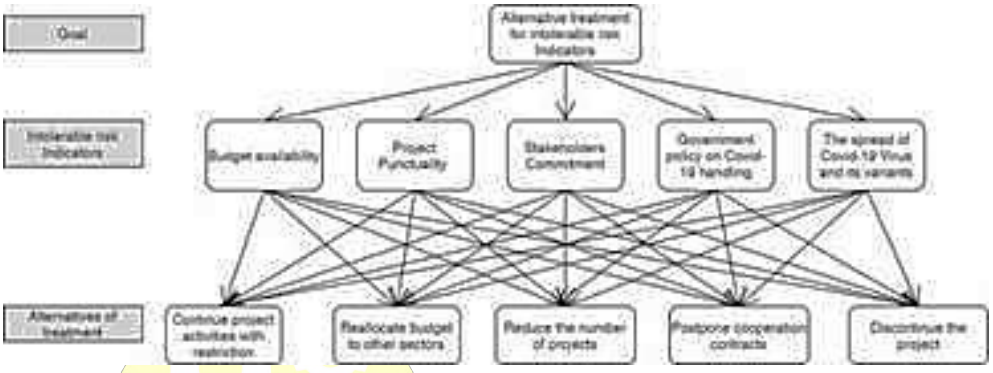

Figure 2.6: *Intolerable Risk Treatment*

Comparison between Intolerable Risk Indicators

The calculation of comparison is assisted by the use of the Expert Choice 11 software application. From the comparison results of 5 intolerable risk indicators, the data shows that the indicator for the spread of the Covid-19 virus and its variants has the highest value of 0.329 compared to 4 other indicators. A comparison between high-level indicators in detail can be seen in the figure 2.7.

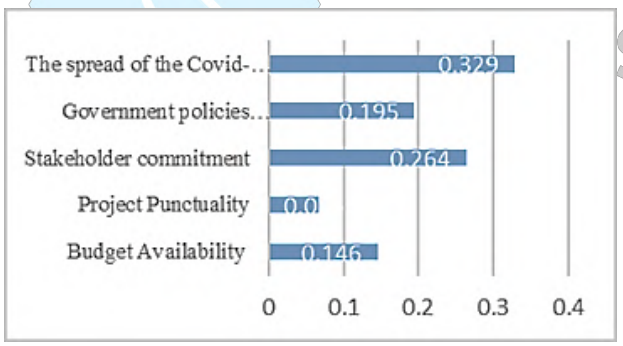

Figure 2.7: *Comparison between Intolerable Risks*

Comparison between Risk Alternatives/Treatments

From the comparison results of 5 intolerable risk indicators, the data shows that the indicator for the spread of the Covid-19 virus and its variants has the highest value of 0.329 compared to the other 4 indicators. The stakeholder commitment indicator has a value of 0.264 and occupies the second level. At the third level, namely indicators of government policies related to handling Covid-19 with a value of 0.195. In fourth place is the availability of the budget with a value of 0.146 and the lowest value is on the project punctuality indicator with a value of 0.066. A comparison between alternative risk management in detail can be seen in the figure 2.8.

V. DISCUSSION

Determination of the risk context varies according to project characteristics and the perspective of project actors. In this study, risk indicators that are distinguished from internal and external contexts from the project owner's point of view compared with the project implementer's point of view have been widely studied in previous studies (Debataraja et al., 2020; Fathoni, 2020; Husin et al., 2019; Nugroho & Iskandar, 2020; Nurudin & Huda, 2020; D. P. Sari et al., 2017).

Of the many risk indicators that can be studied (Aji et al., 2019; Apriyanto & Putro, 2018; Chen, 2018; Dang et al., 2020; Fathoni, 2020; Nusraningrum & Priyono, 2018; D. P. Sari et al., 2017; Tamara et al., 2020), several risk indicators need to be considered during the Covid-19 pandemic. From the point of view of organizational management, the Project owner prioritizes risk indicators in the internal and external contexts by mapping each criterion. In the internal context, the project owner gives priority to operational criteria compared to technical criteria. There are 4 of the 16 risk indicators in the internal and external contexts that become the highest priority for each criterion, namely: a) the ability of foreign experts from technical criteria with the highest score of 0.510 or 51%, b)

availability of budget from operational criteria with the highest score of 0.229 or 23%, c) stakeholder commitment from strategic criteria with the highest score of 0.286 or 29%, d) Government policies related to handling Covid-19 from security and safety criteria with the highest score of 0.400 or 40%. In several studies (Debataraja et al., 2020; Saifudin et al., 2020; Yuniar et al., 2014), force majeure situations or certain situations, whether emergency or not, security and safety are the main priority.

However, indicators of risk on security and safety in the COVID-19 situation have not found any detailed studies on the risks that often arise in projects. The things that are taken into consideration in these criteria are also widely discussed as part of the challenges in the development planning document of the Grant Activity Plan List and the Performance Report on the Implementation of Foreign Loans and/or Grants for the Fourth Quarter of 2019 (Bappenas, 2019). These risk indicators differ in importance according to the context and different perspectives of project actors.

In the risk assessment, the involvement of all stakeholders from various levels such as the project owner, project implementer, and project end-user becomes the main stakeholders that determine the assessment. So that the perspective of risk assessment and evaluation can be considered broader because it reaches stakeholders from various levels (not limited to the project owner only). The grouping of stakeholders in the project was adjusted based on the study reviewed by (Meredith & Zwikael, 2019).

The results of the research analysis show that there are 5 high-level risk indicators with a score of 16 which are included in the intolerable risk classification (with a risk value range of 15-25 in the risk scoring matrix) based on a survey of 46 respondents from the three groups of respondents. Respondents think that 5 risk indicators require better attention and handling, namely risk indicators of budget availability, punctuality, stakeholder commitment, government policies related to handling Covid-19, and the spread of the Covid-19 virus and its variants. The five indicators have a high level of risk or are included in intolerable risk in the risk matrix (Banda, 2019; Nurudin & Huda, 2020)using a multiplication assessment of the severity index on probability and impact which is then presented according to the risk scoring matrix.

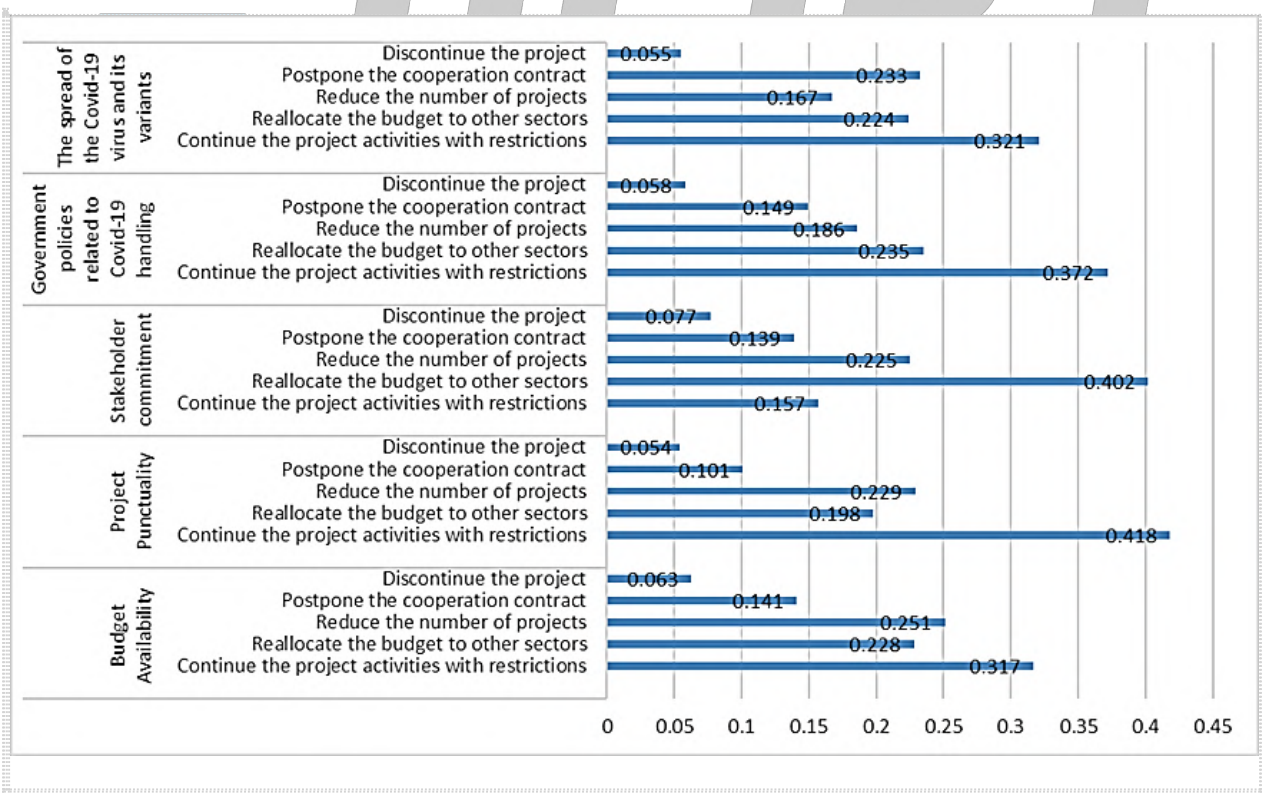

Figure 2.8: *Comparison between Risk Alternatives*

In the 5 high-level risk indicators, there are similarities and differences from the priority risk indicators that have been set earlier. The similarity is that 3 indicators are the same in determining the priority of risk indicators in the internal and external context and the results of the risk level analysis. The 3 risk indicators are budget availability, stakeholder commitment, and government policies related to handling Covid-19. While the difference is first, in determining the priority of risk indicators, the skill of experts becomes the main risk on the technical criteria. Meanwhile, based on the results of the risk level analysis, none of the risk indicators in technical criteria is classified as a high-level risk. Second, the risk indicator for project punctuality and the spread of the Covid-19 virus and its variants are included as high-level risks, but in setting risk priorities, the spread of the Covid-19 virus is not included as a priority indicator.

As a response to the five high-level risk indicators, risk management needs adjustments. In line with research (Dandage et al., 2018)that risk management needs to be identified and managed for the project to be successful (Meredith & Zwikael, 2019). From the research results, the alternative risk treatment varies according to the occurrence of risk indicators. The study suggests that the choice of alternatives/treatment for the indicators of budget availability, project punctuality, government policies related to Covid-19 handling, and the spread of the Covid-19 virus and its variants is to continue the project with restrictions with the highest value of 0.321 or 32%.

The highest priority treatment for the stakeholder commitment indicator is to reallocate the priority to other sectors with the highest score of 0.372 or 37%. These alternative treatments will vary for each development grant project and require managers' ability to analyze risks more deeply (Apriyanto & Putro, 2018; Budihardjo et al., 2019; Flage & Aven, 2015; Khameneh et al., 2016). Many studies explain that the priority of treatment options is not an absolute choice. Each project situation certainly requires different handling (Apriyanto & Putro, 2018; Dandage et al., 2018; Flage & Aven, 2015; Hwang & Song, 2019; Liu et al., 2015; Qian, 2015; D. P. Sari et al., 2017)depending on how many factors affect the dynamics of the project. In addition, 3 risk indicators become a priority in determining the context of internal and external risks and also appear as intolerable risks and the other 2 indicators do not become a priority in determining the context but appear clearly as tolerable risks. Further visualization of the study could be seen in the following figure

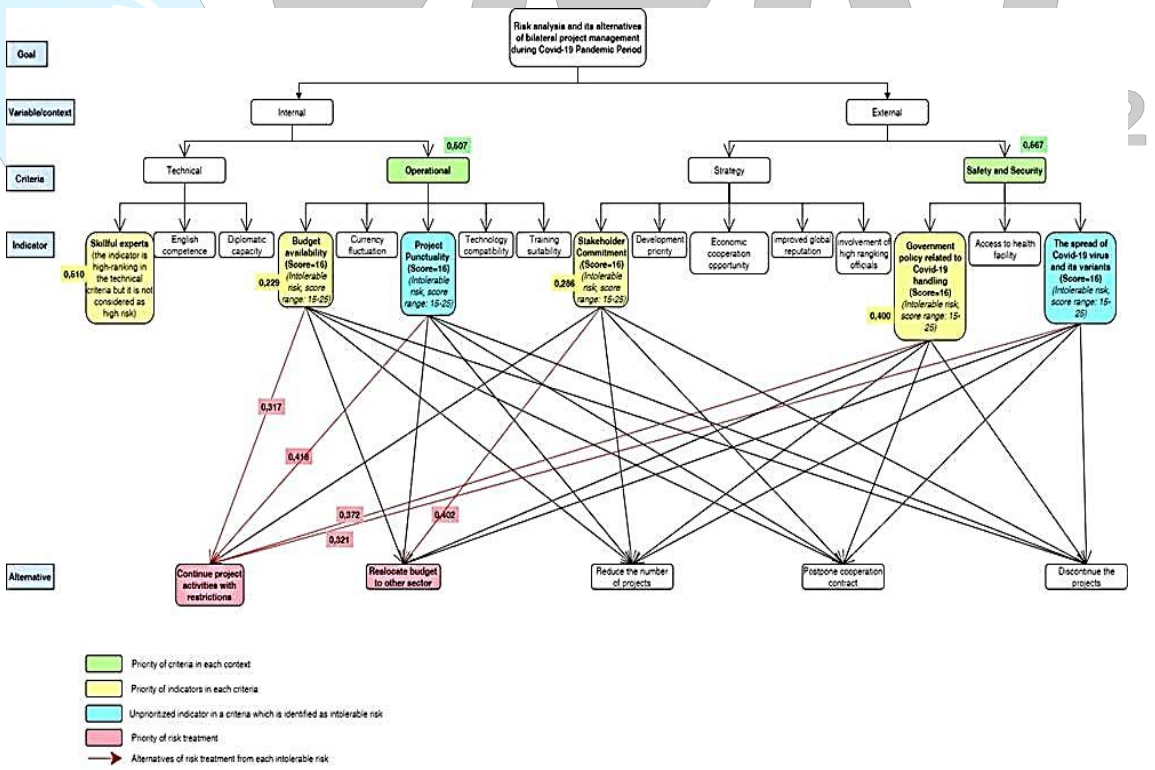

Figure 2.9: *The Structure of Risk Analysis and Its Treatment*

VI. CONSLUSION

The project owner gives priority to the operational criteria compared to the technical criteria, with the weight value is 0.507 while in the external context, the high priority is positioned on security and safety criteria compared to strategic criteria. By comparing the criteria in each context, four priority indicators are generated in the context of project management risk, namely the skill of foreign experts with the highest score of 0.510 on technical criteria, budget availability on operational criteria with a value of 0.229, stakeholder commitment on strategic criteria with a value of 0.286, and government policies related to handling Covid-19 with a score of 0.433 on security and safety criteria.

In the risk assessment, the analysis results show that there are 5 high-level risk indicators with a score of 16 which are included in the intolerable risk classification (with a risk value range of 15-25 in the risk scoring matrix).

Those are budget availability, project punctuality, stakeholder commitment, government policies related to handling Covid-19, and the spread of the Covid-19 virus and its variants. Of the 5 indicators, 3 indicators are priority indicators in the project risk context, while the other 2 indicators are not a priority but are identified as the highest level of risk, namely the project punctuality and spread of the Covid-19 virus and its variants.

The risk treatment options in this study have provided different scores depending on the risk indicators. Of the 5 treatment options, 2 treatment options are prioritized in the study, namely continuing the project with restrictions and diverting the budget to other sectors. The first treatment option is to continue the project with restrictions, it is recommended if the project risks experiencing risks related to budget constraints, punctuality, government policies related to Covid-19, and the spread of the Covid-19 virus and its variants. Meanwhile, the second risk treatment option, namely budget reallocation, is recommended if project management experiences risks related to stakeholder commitment.

VII. LIMITATION

1. Prioritization of risk indicators in the internal and external contexts in the study is the result of comparisons between criteria in each context and the results of comparison of risk indicators in each criterion, but it does not compare indicators across criteria. The study could further analyze risk indicators across criteria to yield a more comprehensive study and optimize the use of the AHP method.
2. A more in-depth study of project risk analysis with relevance to the Covid-19 pandemic situation is highly recommended so that the risks that arise in project management are correlated with the current situation and are in line with the government's handling of the Covid-19 situation. For example, in correlation with restriction activities (PSBB or PPKM) regulated by the government as a form of handling action of the Covid-19 pandemic.
3. To deepen the study, it is necessary to carry out a combination of quantitative and qualitative research, such as indicators to better measure the capabilities of foreign experts, deepen studies on project costs and their impacts, deepen risks analysis arising from stakeholder commitments related to turnover, regulation, and overlapping stakeholder authorities, investigate further the risk related to the handling of Covid-19 pandemic by the government which is considered to change too quickly both regulations and stakeholders so that the study becomes more comprehensive.

This study can serve as a reference for managers of development grant projects whose current references are still very limited. This study can help both governments from donor countries and from the recipient countries in managing the development grants in a force majeure situation. It can also support appointed project implementation teams, as well as researchers, and academics in project risk management.

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