

Risk Analysis of Community Based Infrastructure Grant Program

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Abstract— The Provincial Government of East Java seeks to improve the welfare of the community and overcome socio-economic problems through local grant-making mechanisms. One form of grants carried out by the Administration of Development Bureau (ADB) is road infrastructure development. The implementation of the project has risks that have an impact on the use of ineffective and inefficient regional budget (APBD). Risks obtained from literature which were analyzed to determine the effect of these risks on the sustainability of the program. The Differential Semantic Scale questionnaire was conducted first to assess the relevance of risk to the implementation of the regional grant program. The next step is Risk Level Analysis. At this stage the probability and impact calculation of each risk is carried out. The questionnaire was used to obtain respondents opinion who were responsible for the implementation of the regional grant program. 3 risks have been generated which are included in the high risk level of 26 relevant risks. ADB needs to pay attention to risks, especially priority risks in the management of infrastructure grant program. The findings in this study provide new references in the field of risk management.

Keywords— Grant Program, Infrastructure Project, Risk Management.

I. INTRODUCTION

THE PROVINCIAL Government of East Java is implementing a road pavement development project through a community-based infrastructure grant program. The government grant program is implemented in the context of municipal infrastructure investment [1], and to achieve the development vision and mission as measured by key performance indicators in the East Java Governor Regulation No. 63 of 2019 concerning Work Guidelines and Implementation of Duties of the Government of East Java Province 2020. Communities as recipients of these grants benefit from the development of road infrastructure to support their activities and in a broader sense can improve welfare [2]. A successful infrastructure project must meet the community needs [3], so their active role is very influential on this program. The community referred to in this program is a formal community organization that is directly related to the proposed infrastructure development project. The development of road infrastructure is carried out by the Administration of Development Bureau (ADB) with funding sources from regional funds (APBD).

The community-based grant program is an effort to empower the community to play an active role in the development in their environment with a predetermined mechanism [4]. Communities need to participate in

development because they are the ones who understand their own infrastructure needs, especially in the field of community development which helps improve regional accessibility to public facilities [5]. The mechanism for awarding grants refers to the East Java Governor Regulation 47 of 2017 concerning Procedures for Budgeting, Implementation and Administration, Reporting and Accountability and Monitoring and Evaluation of Grants and Social Assistance.

Every program launched by the government certainly has risks, including infrastructure grant programs, for this reason it is necessary to identify these risks retrospectively or prospectively [6]. Risks to infrastructure grant programs are generally the same as risks to construction projects which are generally divided into internal and external risks [7]. External risks are related to political, economic, environmental and act of God conditions, while internal risks are related to design, work on the site, and operational and managerial. Risks that impede the grant program can have an impact on the use of an effective and inefficient budget.

This study aims to identify risks in the East Java Provincial Government's infrastructure grant program carried out by the ADB. The results of this study can be used as a reference and consideration to stakeholders to improve the performance of the implementation of the infrastructure grant program. Good performance will lead to the sustainability of the program.

A. Infrastructure Grant Program

The infrastructure grant program is demanding the active role of all stakeholders with the community as the main subject. Infrastructure, one of which is a residential road is basically an asset that can be donated through certain mechanisms. The policy mechanism of granting as a formal public policy that applies significantly influences the behavior patterns of the stakeholders involved in it [8]. There are three stages in the governance process of the infrastructure grant program implemented by the ADB as shown in Figure 1, namely the planning, implementation, and monitoring and evaluation (monev) stages. The three stages are interconnected and carried out sequentially into a mechanism. At each stage of the program process, there are stakeholders involved and responsible in it. Risks to the program can be identified and compiled at each stage of the process.

B. Program Risk Identification

Risk identification in the grant program needs to be done as an initial step in risk management efforts. The existence of risks is the nature of construction projects that need to be identified and basically due to the complexity of activities and

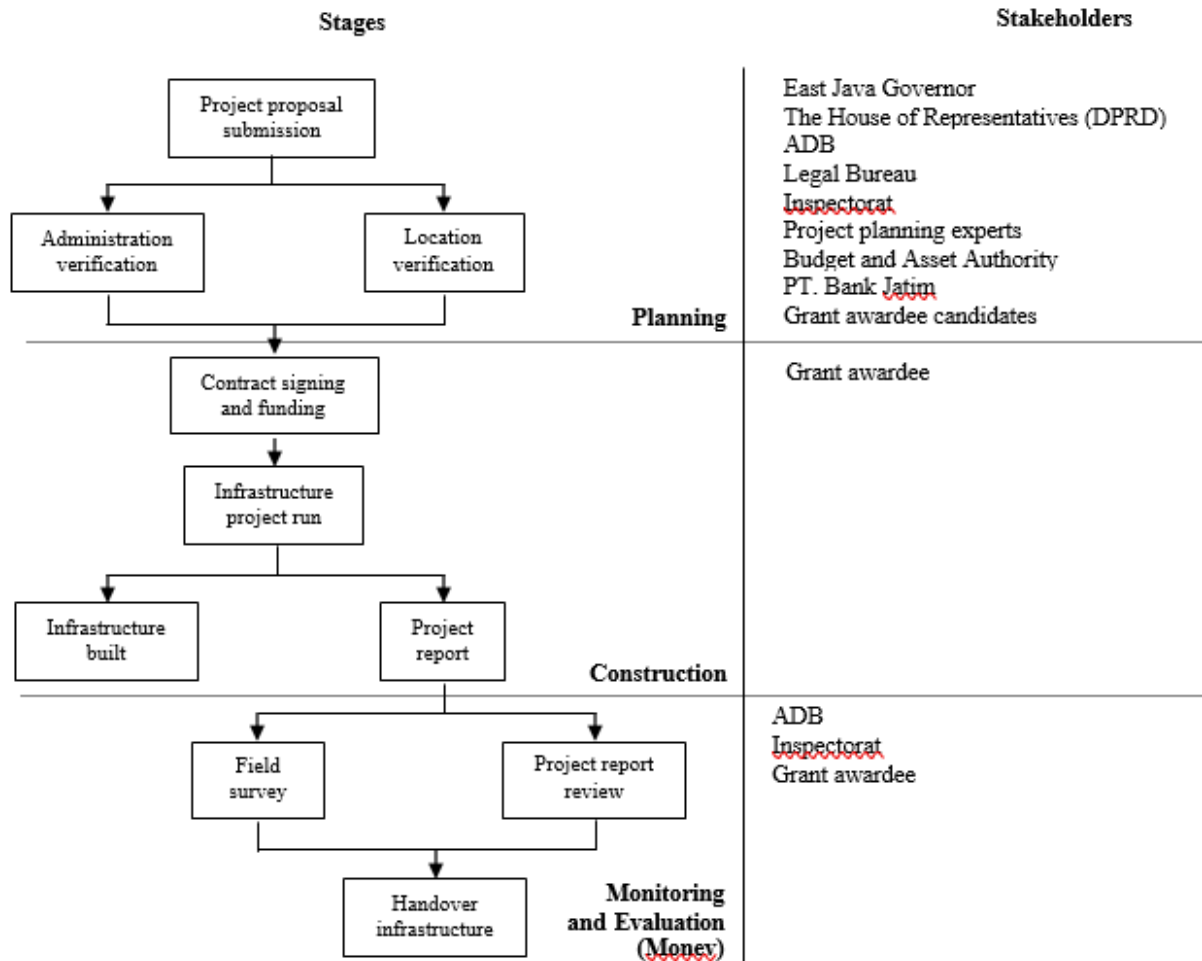


Figure 1. Program flowchart

processes, environmental influences, and organizational dynamics in them [9-10]. Important risk identification is carried out especially on negative risks, comprehensive insight is needed for the program comprehensively so that the identified risks are more relevant. Risks in construction-related activities need to be recognized and classified as part of identifying risks to facilitate analysis and formulation of follow-up recommendations as needed [11]. The role of stakeholders is also very important in the effort to identify these risks. Risk can be measured by the level of risk with the probability component of the risk and the impact of risk on certain aspects in the case study. The risk level formula as written in Eq. (1). The value of risk (R) is a equivalent multiplication between probability (P) and impact (I). The level of risk can be grouped into certain categories, PMBOK determines there are 5 probability and impact categories, and 3 risk categories according to Table 1 [12]. Categorization is more weighted on impact, not probability.

II. METHOD

A. Data Collecting Procedure

Data collection was carried out through the distribution of questionnaires to respondents who were directly involved in each stage of the infrastructure grant program process and were selected through purposive sampling. Infrastructure grant programs as inter-organizational projects involve

internal and external stakeholders who work together and support one another to achieve the same goals [13]. Before the questionnaire was distributed, a review of the infrastructure grant database in 2014-2018 was conducted at the ADB. In this study, the data used are primary data from the results of the risk relevance questionnaire and the risk level questionnaire. Identification of relevant risks is a preliminary survey (PS) conducted to determine the relationship of risk that has been formulated from a literature study on program implementation. After knowing the relevant risks, then we need the primary data on the probability and impact of the risk obtained through the main survey (MS) questionnaire. Respondents shown in Table 2 are stakeholders who are directly involved in the program.

B. Analysis Technique

This research uses qualitative analysis techniques and is confirmative in nature. There are two stages of analysis, namely the analysis of the relevance of risk and analysis of risk levels. Identification of the relevance of risk is done with the Semantic Scale Differential, which is an analysis tool to determine the tendency of respondents to two conflicting statements [14]. In this study semantic scale differentials are used for "relevant" and "irrelevant" statements. The limit of risk value that is said to be relevant is the mean risk value ≥ 3 . Risk level analysis is done by calculating the probability of the impact. The results of the measurement of the probability

Table 1.
Risk level category of PMBOK [12].

P		R = PI				
5	5	10	15	20	25	
Very high	Low	Moderate	High	Very High	Very High	
4	4	8	12	16	20	
High	Low	Low	Moderate	High	Very High	
3	3	6	9	12	15	
Moderate	Low	Low	Moderate	High	Very High	
2	2	4	6	8	10	
Low	Very Low	Low	Moderate	High	High	
1	1	2	3	4	5	
Very low	Very Low	Low	Moderate	Moderate	High	
	1	2	3	4	5	
	Very low	Low	Moderate	High	Very high	

Table 2.
Responden list of preliminary survey and main survey.

Responden	Institution	PS	MS
Head of Administrative Control Section for the Implementation of Regional Development	ADB	1	1
Head of Sub-Division of Administration	ADB	1	1
Infrastructure Grant Program Management Staff	ADB	3	5
Government Internal Superintendent Apparatus	Inspectorate	-	1
Project planning experts at the ADB	Private sector	-	2
Administrative Monitoring and Evaluation Consultant	Private sector	-	1
Field Monitoring and Evaluation Consultant	Private sector	-	5
Grant recipients	Legal Entity / Institution / Organization of community	-	5
Total		5	21

Table 3.
Description of Probability (P) and Impact (I) of Risk

Level	Category	Probability (P)	Impact (I) to Time	Impact (I) to Quality	Impact (I) to Reputation
1	Very low	Risk is almost never or very rare (1-20%)	Delay 1-5% of the program duration	The decrease in the quality of the program is very insignificant	The decline in program reputation is not significant
2	Low	Risk is rare (21-40%)	Delay 6-20% of the program duration	The decrease in program quality is quite significant	The decline in program reputation is rather significant
3	Moderate	The likelihood is not and the risk is more or less the same (41-60%)	Delay of 21-50% of the program duration	The decrease in program quality is significant	The decline in program reputation is significant
4	High	The risk is most likely to occur (61-80%)	Delay 51-100% of program duration	The decrease in the quality of the program is very significant	The decline in program reputation is very significant
5	Very high	Risk is almost always or very likely (81-100%)	Delay > 100% of the program duration	Declining quality of programs that lead to failure	Program loses reputation

and impact of the risk obtained through the main survey are used as a value for the level of risk. Probability values and risk impacts will be formed matrix so that risk categories will be identified. The level of risk can be sorted by priorities for consideration of recommendations for follow-up. The impact of risk in this infrastructure grant program is reviewed according to the aspects of time, quality, and reputation based on references from Hadiyanti [15] and JISC [16] as shown in Table 3 below. there are 5 different categories where probability and impact values will be determined based on information from respondents.

III. RESULT AND DISCUSSION

There are 35 risks compiled from relevant sources related to risks in the community-based infrastructure grant program as set out in Table 4. The risk is obtained from the review data and literature review which has been grouped according to the stages of the program process and the type of risk. In the

infrastructure grants program by the ADB, risk types are divided into administrative and technical. Administrative risk relates to supporting activities both before and after the donated goods or services are realized. Technical risk is the risk of the main activity to realize the gifted goods or services. Risks are obtained from each stage of program implementation.

A. Risk Relevance

Relevant risk indicates that the risk is related to the case study being investigated. The results of the questionnaire showed that there were 26 relevant risks. 2 new risks are identified, while irrelevant risks are 11. Standard deviations (SD) indicate the size of the distribution of respondents' data on the assessment of the relevance of these risks.

B. Risk Level Analysis

Risk relevance analysis is important to be done to uncover ambiguous and unambiguous risks related to the program, so that the risk information obtained is more reliable [29]. The level of risk (R) in this study is indicated by quantitative

Table 4.
Risk Register

Code	Risk	Stage	Type	Reference
R1	APBD and / or its revision ratification is late	Planning	Administrative	[17]
R2	Prospective grant recipients do not send proposals	Planning	Administrative	[17-19]
R3	Grant applicants are late in submitting final proposals	Planning	Administrative	[17-19]
R4	Grant program management staff does not understand the mechanism of the program	All stages	Administrative	[17-19]
R5	Grant program management staff does not implement the program mechanism according to the rules	All stages	Administrative	[17-19]
R6	Grant recipients do not understand the mechanism of the program	All stages	Administrative	[17-19]
R7	Grant recipients do not implement program mechanisms according to the rules	All stages	Administrative	[17-19]
R8	Lack of support from the local government for the program	All stages	Administrative	[20-22]
R9	Lack of support from the local community for the program	All stages	Administrative	[20-22]
R10	Details of work costs not included in the budget plan (RAB)	All stages	Technical	[17, 19-20, 23]
R11	Technical drawings do not match field conditions	Planning	Technical	[19-20, 24]
R12	Conflict of interest	All stages	Administrative	[17-20]
R13	Land site is not well conditioned	Planning and Construction	Technical	[19, 24]
R14	The unavailability of adequate construction tools	Construction	Technical	[17, 23]
R15	The unavailability of sufficient material	Construction	Technical	[23]
R16	The unavailability of skilled workers	Construction	Technical	[17, 25]
R17	Lack of coordination between stakeholders	All stages	Administrative	[20-22]
R18	Project sites overlap with other programs	Planning	Administrative	[19, 21, 26]
R19	Change of management in Legal Entity / Institution / Organization of community	All stages	Administrative	[21]
R20	Project duration exceeds the provisions	Construction	Technical	[19, 23, 27]
R21	Difficult mobilization in and out of the project site	Construction	Technical	[27]
R22	Changes to job specifications	All stages	Technical	[21, 23]
R23	Change in project site location	Planning	Technical	[21, 23]
R24	Budget changes	All stages	Administrative	[17, 19]
R25	Changes to the rules regarding program mechanisms	All stages	Administrative	[19, 21]
R26	Natural disasters	All stages	Technical	[17]
R27	Social disasters	All stages	Technical	[26]
R28	Construction results are not in accordance with the plan	Monev	Technical	[19-20, 23]
R29	Supervision of work is not optimal	Construction	Technical	[17-18, 21]
R30	The APBD grant program seminar that was held was ineffective and inefficient	Planning and Construction	Administrative	[28]
R31	Discrepancy findings by the inspectorate	Monev	Administrative	[17-18, 26]
R32	Document archive is corrupt	All stages	Administrative	[25-26]
R33	Document archive missing	All stages	Administrative	[25-26]
R34	The accountability report (LPJ) is incomplete	Monev	Administrative	[19-20, 25-26]
R35	Stakeholder default report	All stages	Administrative	[17-18, 25, 28]

scores in the form of scores and qualitative in the form of risk categories. The level of risk is identified by the aspects affected by the risk and is classified as shown in Table 1.

Combination of the calculation of the level of risk influence on three aspects (time, quality, and reputation) produces different values to improve the accuracy of the analysis results. There are 3 risks that are included in the high category, namely R1, R3, and R4. All three risks have the same score of 16. The risk category is still dominated by the moderate category. Risk rank varies in the range 1-8. The mean risk value obtained is 8.69 and Std. Dev. 3.05 as shown below in Table 6. Risk level matrix shows tendency to group risks according to their categories as in Table 7.

Risks included in the high level of risk need to be given more attention by ADB because this can be related to the sustainability of the program while still directly involving the community in the development of public infrastructure [30]. R1 shows that some grantees do not understand the mechanism of the program itself, even though they are fully responsible for infrastructure grants that have been provided through ADB in the agreement. This can lead to consequences in the form of new problems that affect the program in terms of time, quality, and reputation.

Incompatibility between development results and planning, R3, can have a major impact on the reputation of the program and its stakeholders because it is related to regulatory violations. Inadequate development results lead to budget compensation. The solution to this deficiency can be done by returning a grant or meeting the difference in volume. Supervision of a project is important so that the project can be carried out well with minimal deficiencies. The high level of R4 risk can trigger administrative and technical errors in program implementation. From the Figure 1 diagram, it can be seen that supervision, especially in the implementation phase, is the responsibility of the recipient of the work. There is no oversight by other stakeholders.

IV. CONCLUSION

Based on the results of the identification of risks in the infrastructure grant program, 26 risks are identified as relevant. Provincial Government of East Java has not yet fully made regulations that cover the entire running process of the program. Recommendation we suggest is to add rules regarding more serious supervision to the existing regulations and accountable reporting. If the overall high category risks

Table 5.
Risk Register

Old Code	New Code	Risk	Mean	SD	RR
R6	R1	Grant recipients do not understand the mechanism of the program	4.40	0.49	Relevant
R11	R2	Technical drawings do not match field conditions	4.40	0.49	Relevant
R28	R3	Construction results are not in accordance with the plan	4.00	0.89	Relevant
R29	R4	Supervision of work is not optimal	3.80	1.17	Relevant
-	R5	Grant applicants are late in submitting accountability report (LPJ)	3.80	1.17	Relevant
R20	R6	Project duration exceeds the provisions	3.60	1.02	Relevant
R12	R7	Conflict of interest	3.40	1.02	Relevant
R22	R8	Changes to job specifications	3.40	0.49	Relevant
R34	R9	The accountability report (LPJ) is incomplete	3.40	1.02	Relevant
R3	R10	Grant applicants are late in submitting final proposals	3.20	1.47	Relevant
R7	R11	Grant recipients do not implement program mechanisms according to the rules	3.20	0.98	Relevant
R10	R12	Details of work costs not included in the budget plan (RAB)	3.20	1.47	Relevant
R17	R13	Lack of coordination between stakeholders	3.20	0.75	Relevant
R21	R14	Difficult mobilization in and out of the project site	3.20	0.40	Relevant
R30	R15	The APBD grant program seminar that was held was ineffective and inefficient	3.20	0.75	Relevant
R31	R16	Discrepancy findings by the inspectorate	3.20	0.75	Relevant
R35	R17	Stakeholder default report	3.20	0.75	Relevant
-	R18	Stakeholders coordination is hampered	3.20	0.75	Relevant
R8	R19	Lack of support from the local government for the program	3.00	0.89	Relevant
R14	R20	The unavailability of adequate construction tools	3.00	0.89	Relevant
R15	R21	The unavailability of sufficient material	3.00	0.89	Relevant
R16	R22	The unavailability of skilled workers	3.00	0.63	Relevant
R23	R23	Change in project site location	3.00	1.26	Relevant
R26	R24	Natural disasters	3.00	0.89	Relevant
R27	R25	Social disasters	3.00	1.41	Relevant
R32	R26	Document archive is corrupt	3.00	0.89	Relevant
R9	R27	Lack of support from the local community for the program	2.60	0.75	Irrelevant
R1	R28	APBD and / or PAPBD ratification is late	2.40	0.74	Irrelevant
R18	R29	Project sites overlap with other programs	2.40	0.49	Irrelevant
R13	R30	Land site is not well conditioned	2.20	1.35	Irrelevant
R2	R31	Prospective grant recipients do not send proposals	2.00	0.40	Irrelevant
R24	R32	Budget changes	2.00	0.00	Irrelevant
R5	R33	Grant program management staff does not implement the program mechanism according to the rules	1.80	0.39	Irrelevant
R19	R34	Change of management in Legal Entity / Institution / Organization of community	1.80	0.75	Irrelevant
R25	R35	Changes to the rules regarding program mechanisms	1.80	0.75	Irrelevant

Code	Risk	P	I	PxI	Category	Rank
R1	Grant recipients do not understand the mechanism of the program	4	4	16	high	1
R3	Construction results are not in accordance with the plan	4	4	16	high	1
R4	Supervision of work is not optimal	4	4	16	high	1
R2	Technical drawings do not match field conditions	3	3	9	moderate	2
R5	Grant applicants are late in submitting accountability report (LPJ)	3	3	9	moderate	2
R6	Project duration exceeds the provisions	3	3	9	moderate	2
R8	Changes to job specifications	3	3	9	moderate	2
R9	The accountability report (LPJ) is incomplete	3	3	9	moderate	2
R11	Grant recipients do not implement program mechanisms according to the rules	3	3	9	moderate	2
R12	Details of work costs not included in the budget plan (RAB)	3	3	9	moderate	2
R13	Lack of coordination between stakeholders	3	3	9	moderate	2
R16	Discrepancy findings by the inspectorate	3	3	9	moderate	2
R17	Stakeholder default report	3	3	9	moderate	2
R18	Stakeholders coordination is hampered	3	3	9	moderate	2
R20	The unavailability of adequate construction tools	3	3	9	moderate	2
R22	The unavailability of skilled workers	3	3	9	moderate	2
R24	Natural disasters	3	3	9	moderate	2
R7	Conflict of interest	2	3	6	moderate	3
R10	Grant applicants are late in submitting final proposals	2	3	6	moderate	3
R15	The APBD grant program seminar that was held was ineffective and inefficient	2	3	6	moderate	3
R19	Lack of support from the local government for the program	2	3	6	moderate	3
R21	The unavailability of sufficient material	2	3	6	moderate	3
R23	Change in project site location	2	3	6	moderate	3
R25	Social disasters	2	3	6	moderate	3
R14	Difficult mobilization in and out of the project site	3	2	6	low	4
R26	Document archive is corrupt	2	2	4	low	5

with risk level analysis methods based on time, quality, and reputation impact, there are 3 total high risks as listed below.

1. R1 Grant recipients do not understand the mechanism of the program
2. R3 Construction results are not in accordance with the plan
3. R4 Supervision of work is not optimal

We are aware of the potential for development in this study because there are still study limitations. The discussion in this study only focuses on one agency, not covering a wider area with various complexities of the infrastructure grant program being implemented. There are various methods that can be used in future research that can be tailored to the needs of researchers and the characteristics of case studies.

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