

Evaluation of Project Management Implementation Case Study: Environmental Phytoremediation Project in PT. Abadi Bersama Cahaya Indonesia

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Abstract

Phytoremediation is the environmental projects run by PT. Abadi Bersama Cahaya Indonesia. In 2020, the project encountered a performance gap between plan and actual. It was 169% above plan, where maximum gap found in previous year 45%. It caused the project to react with the project change. Furthermore, a potential risk was found where project would be executed by different organization in 2021. The evaluation is conducted to define factors of project management process done to achieve project objective in 2020 and to define recommendation of improvement solutions to sustain project success in the next project year.

This research used qualitative research focusing on planning and executing phase to define affected factors in project success from high-impacted departments; project, construction and facility operation team. There are 3 factors that mostly affect to the successful Phytoremediation project, which are project alignment, performing risk assessment and mitigation, and good schedule and resource plan. Meanwhile, there are 3 recommended solutions to attain successful project objective in the next project year, which are improve communication techniques and meeting frequency from leaders to team members, develop risk assessment matrix at all potential sites, and obtain 2 dedicated and 1 shared contractors to handle E.P. project.

Keywords: Phytoremediation, Project Management, Project Success

1. Introduction

As a company engaged in energy industry, environment is a critical aspect that is very closely related and must be considered for PT. Abadi Bersama Cahaya Indonesia. Phytoremediation project presents as one of efforts conducted by PT. Abadi Bersama Cahaya to improve the function of environment impacted by business activity. Phytoremediation is one of many “green technology” method implemented to reduce the level of contamination in a ground soil, surface water, and ground water from toxic pollutants, such as metals or other toxic organic composites (Paz-Alberto 2013).

According to the performance result in 2020, the project encountered an issue where the actual contaminated soil increased significantly and required more site processing than predicted. Even though the project had successfully achieved the objective in providing the required capacity of processing site, but the gap between plan and actual was quite big. It caused the project have to react quickly with the project change. Furthermore, there is a potential risk where project will be executed by different organization started in 2021. Therefore, the evaluation is necessary to be conducted to absorb information on how the project was performed and to ensure the project can attain successful its objectives in the next project year.

Since the project had been completed in 2020 and will be continued in 2021, the evaluation is expected could provide information and recommendation in achieving project objective. So, the evaluation is focused on planning and execution process by determining the factors that had been done by the company in dealing with project changes and defining the proper recommendation of improvement to ensure the project can be run smoothly in order to achieve project’s objective in next project year.

1.1 Research Objectives

By evaluating project management process implementation in planning and executing phase in Environmental Phytoremediation project, the objectives of this research are defined through the following questions:

1. What are factors of project management process that had been done to achieve project's objective in 2020?
2. What solution of improvement that can be recommended to E.P project to sustain project success in the next project year?

2. Literature Review

Project Definition

According to Tuman (1983) from Prabhakar (2009), a project is defined as people organization devoted to achieve specific objective or purpose. Generally, the large, unique, expensive or high-risk efforts are required in order to complete the project within targeted time, budget by utilizing expected performance. It is necessary for a project to have clear objective and sufficient resource in order to complete the project tasks.

Turner (1999) from Prabhakar (2009) added that project is defined as a job carried out by organizing resources of human, money, and others material in order to conduct a specific and unique scope of work within targeted time and cost and to achieve beneficial results both quantitatively and qualitatively.

Project Management Process

According to PMI (2017), Project management is accomplished through the appropriate application and integration of logically grouped project management processes. A Project Management Process Group is a logical grouping of project management processes to achieve specific project objectives. Process Groups are independent of project phases. Project management processes are grouped into the five Project Management Process, which are Initiating, Planning, Executing, Monitoring and Controlling, and Closing. In addition to Process Groups, PMI (2017) has stated that processes are also categorized by Knowledge Areas. A Knowledge Area is an identified area of project management defined by its knowledge requirements and described in terms of its component processes, practices, inputs, outputs, tools, and techniques. The ten Knowledge Areas identified in this guide are used in most projects most of the time, which are Project Integration Management, Project Scope Management, Project Schedule Management, Project Cost Management, Project Quality Management, Project Resource Management, Project Communications Management, Project Risk Management, Project Procurement Management, and Project Stakeholder Management).

Project Success Measurement

According to Gido and Clements (1999) from Koelmans (2004), the criteria of project success refer to four things; they are schedule, budget, quality, and the satisfaction of customer. They emphasized that project success would require people, team and organization, project management tools and techniques and good stakeholders engagement. Read (2003) from Koelmans (2004) added health, safety and the environment as further aspect of project success criteria that should be considered. From the above description, Koelmans (2004) combined those criteria to be project success constituent as shown in figure 1.

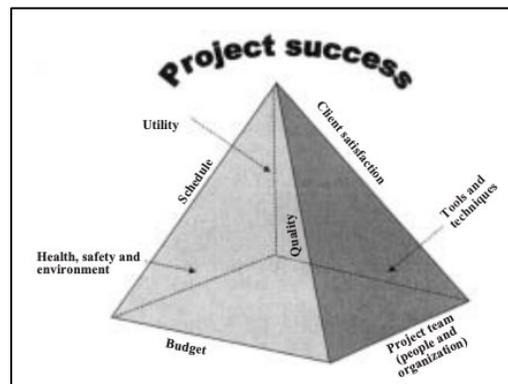


Figure 1. Project Success Constituents

Stakeholder Management

According to Crawford, et al. (2006) from Zwikael and Smyrk (2019), stakeholders become the main important part of project management success criteria since it is related to project expectation. Bourne and Walker (2005) from Zikael and Smyrk (2019) emphasize that stakeholder is considered as an important factor because it has a significant impact to the project. Therefore, Kerzner (2017) from Zwikael and Smoyrk (2019) concluded that stakeholders should be identified and assessed to define potential impact to the project both opportunity and threat.

Communication Management

Communication is an important tool in a project management, where it is considered as a decisive aspect that could affect to the project success (Rajkumar 2010). Berzkalns (2003) emphasizes that a project could not obtain its success without good communication. Hence, communication need to be established and managed to obtain positive impact in order to attain project success.

Risk Management

In risk management, project risk is identified, assessed and mitigated. Good project risk management could lead to project success. Otherwise, project would potentially deviate from project plan and fail to attain project objectives (PMI 2017). In addition, project team has an important role in identifying exposure level of the risk to the project's goal. Therefore, risk management should be carried out to obtain and select appropriate risk mitigation, which lead to the project success (PMI 2017). It is necessary to obtain proper risk strategy formulation and research based on real life experience in order to provide effective solutions and efficient strategies to overcome risk impacts (Srinivas 2019). Rahman and Adnan (2020) has emphasized that risk analysis is an effective plan contributing to project success. Furthermore, they concluded that an efficient and effective strategy of risk management with performance measurement helps organizations achieve success in their projects, which could lead to maximum profitability efficient use of resources.

Schedule and Resource Management

Schedule and resource are 2 interrelated parameters need to be managed properly because poor management would lead to the project delay and cost overruns (Al Hajj and Zrauni 2018). Indeed, Crisan and Borza (2014) from Suresh and Sivakumar (2019) emphasized schedule and resource could be separated as they feed to each other. These 2 factors are required to be managed by develop proper plan and apply scenarios in order to adjust with actual project condition. This proper schedule and resource plan could be attained by determining and executing the most priority and impacted scope (Villafanez et al. 2020).

3. Methodology

The research was not conducted to obtain a standard statistic value, but to get information from many perspectives, especially from those who were directly involved in the object on the problem statement. In addition, the research was conducted to elaborate the theory from the literature review. Therefore, the research used qualitative research approach in collecting reliable information, opinion and insight from selected relevant stakeholder. Primary and secondary data need to be collected to enlarge research information and further analysis.

3.1 Data Collection

Data collection for this research is defined by 2 categories, primary data and secondary data. Primary data in this research is collected through interview from 9 respondents, who came from three departments; they are Capital Project, Construction and Facility Operation team. The respondent is selected based on their impact and contribution to the E.P. project in planning and executing phase. The research found this number of respondents was sufficient to address the research problems where the purpose of interview met its saturation with no further ideas emerged. Further collecting data is not necessary when saturation is attained in term of new themes identification (Brannen and Collard 1982) cited from Baker and Edwards (2012). Furthermore, the interview was conducted on three departments where each of it consists of three respondents as shown in the following Table 1.

Table 1. Interview Respondents

No.	Initial	Division	Position	Remarks
1	R1	Project Team	Project Engineer	12 years experience in the project with various company
2	R4	Project Team	Project Manager	Have been rolled in current position for 12 years
3	R9	Project Team	Sr. Project Manager	Have been rolled in current position for 2 years
4	R2	Construction Team	Field Supervisor	5 years experience in construction with various company
5	R5	Construction Team	Engineer	Have been rolled in current position for 9 years
6	R7	Construction Team	Team Leader	22 years experience in construction with various company
7	R3	Facility Operation Team	Field Representative	Have been rolled in current position for 6 years
8	R6	Facility Operation Team	Analyst	Have been rolled in current position for 5 years
9	R8	Facility Operation Team	Subject Matter Expert	Have been rolled in current position for 6 years

Interviews were conducted according to the interview questions that had been set differently to Project Team and Other Teams (Construction & Facility Operation Team). The interview questions were generated with expectation to obtain objective, qualified, sufficient and important information related to the research objectives (to find out key factors in planning and executing project, and find out solution that can be improved to attain successful project objective) can be captured from the interview.

3.2 Data Interpretation

According to the interview results, findings are grouped into several categories, which are super category, category, and sub-category and mapped based on keywords mentioned by respondents. The Sub Category is keyword that has been interpreted from respondent's answer, the category is generated from sub-categories based on words similarity, and super category is generated based on group of categories keyword.

By using structural coding methods, interview results are generated by calculating number of respondents who mention the same particular keywords. According to Saldana (2009:68), the code frequency report can help identify which themes, ideas, or domains were common and which rarely occurred. From interview results mapping, found that there are 49 keywords mentioned by 9 respondents and came up with 6 keywords as major findings to obtain research objectives.

4. Results and Discussions

4.1 Findings

There are 6 of 49 keywords that are considered as major findings since more than 5 respondents have mentioned those keywords more frequently than other keywords. The following Table 2 shows the summary of major findings obtained from interview result coding and interpretation.

Table 2. Major Findings Summary

No	Findings	Remarks
1	Maintaining Alignment	Mentioned 47 times from 9 respondent make this findings become the most frequent construct mentioned by respondents as a key parameter for solution and recommendation to obtain project success.
2	Performing Risk Assessment and Mitigation	Mentioned 21 times from 9 respondents, which is considered as an important thing as a challenge and solution for a project.
3	Performing Good Collaboration	Mentioned 14 times from 7 respondents, which is considered as a challenge and recommendation in obtaining project success.
4	Obtaining and Utilizing Lesson Learn	Mentioned 11 times from 6 respondents as a parameter that is recommended for project improvement.
5	Good Schedule and Resource Management	Mentioned 7 times from 5 respondents as a recommendation and solution for project improvement.
6	Innovative	Mentioned 5 times from 5 respondents, which one of respondents in manager level mentioned it for 3 times, make this parameter as an important thing to have in a team as a solution for project improvement.

In order to identify possible causes of success in this E.P. project, researcher uses Ishikawa diagram to analyze cause and effect factors based on interview results, coding interpretation result and major constructs as described earlier.

The root cause analysis results 3 possible causes to this project success as described below, while others were considered as effects of those 3 root causes.

Project Alignment

This project had conducted many alignments both with working level and high-management level. This strategy was very suitable to be applied in this project because this project was considered as new project and there were no clear guidelines for its operation. Hence, it is required to do alignment with all stakeholders in order to define best practices and mitigate issues that arise during project execution. Meanwhile, an issue was encountered during project execution where the working level across team found miss alignment among them in term of project objective. The researcher observed since project alignment had been conducted quite often, the issue might be caused by communication techniques delivered from leaders to team members that led to miss leading. Furthermore, in-depth studies will be required in future research to determine the major root cause if this issue is still encountered after conducting improvement.

Performing Risk Assessment and Mitigation

This project has conducted risk assessment during planning phase, which made project could react quickly to the issue encountered during execution phase. All risks were identified during planning, then discussed to the related expert and stakeholders to define risk mitigation solution. Meanwhile, this project still finds an issue in defining wide-centralized processing site, which mentioned by respondents from Facility Operation. In project execution, the researcher observed the project reacted to fulfill capacity demand by opening scattered small area that affected to long trip mobilization, which could affect to the project schedule as well. So, it will require an improvement to attain project objective effectively in the next project year.

Good Schedule and Resource Plan

This project was considered success because it could meet project goal in obtaining site processing capacity within tight schedule. Schedule and resource are two important aspects that need to be well defined during planning phase since it will affect to the project success or failure. Proper schedule and resource plan can be obtained by integrating lessons learn identified and documented in the risk assessment management. Meanwhile, the project encountered issue during execution where construction team found the contractor had lack of equipment to speed up construction progress in one of constructed site. Observing this issue, improper schedule and resource plan would lead to project delay or failure.

4.2 Triangulation

In order to validate findings obtained by qualitative research, the researcher used triangulation to emphasize findings. Triangulation is a useful tool to capture more detail, minimize bias effect and ensure a research study balance (Honorene 2017). In addition, Chako (2017) concluded through his research that triangulation is not just a tool, but also is a solution to provide reliable and valid data. Theoretical triangulation was used in this research to emphasize findings according to some literatures as described in the following table 3.

Table 3. Theoretical Triangulation of Qualitative Research

Research Question	Findings	Result of The Research	Theory
What are factors of project management process that had been done to achieve project's objective in 2020?	1. Project Alignment	This project dealt with many team from various departments; project team, construction, facility operation, business, logistic, legal, and corporation affair. Other than that, external stakeholder from local community was also involved in this project. In order to ensure all stakeholders were in same perspective to attain project objective, the project had conducted project meeting in daily basis with all related team to	Perezani (2010) stated that a powerful way to build a sustainable partnership between all stakeholders in a project is by sharing the main goal, so that all parties understand and align without changing the local goal of each team. In addition, Fonvielle and Lawrence (2001) from Alsudiri, et al. (2012) had added that alignment in general is an essential effort for organizational success. By "alignment" they mean having a common agreement between all three levels of strategy (corporate, business, and functional level) concerning goals and means.

		avoid miss leading across team.	Zolfaghari et al. (2020) had emphasized that project effectiveness could be attained by aligning priority of project management with organizational strategies.
	2. Risk Assessment and Mitigation	This project had managed the risk management by conducting site assessment, involving subject matter expert and utilizing lesson learn from previous project year.	<p>Mobey & Parker (2002) from Kishk and Ukaga (2008) had stated that to increase the chances of a proposed project succeeding, it is necessary for the organization to have an understanding of potential risks, to systematically and quantitatively assess these risks, anticipating possible causes and effects, and then choose appropriate methods of dealing with them.</p> <p>Uher & Toakley (2009) from Suresh & Sivakumar (2019) emphasized that risk refers to external exposure that can give negative effect on the project. The possibility of risk impact to the project shall be assessed since it will be detrimental to the successful project execution and proactive plan to mitigate them.</p> <p>Proper project risk management creates value for project outcomes, which relates to the project success and strategic benefits (Willumsen et al. 2019).</p>
	3. Good Schedule and Resource Plan	This project utilized well-experienced contractors in executing project and best practice from previous project year.	<p>Suresh & Sivakumar (2019) concluded on their research that schedule management refers to time management determined by resources management. Furthermore, they added that time management included in factors which affect to the project management effectiveness.</p> <p>Schedule and resource plans are developed in project management plan, which correlates in project success (Serrador 2013).</p>

4.3 Proposed Solution

According to the major root causes that are identified on the root cause analysis in the early discussion, recommendation for improvement in order to attain project objective in the future project can be explored. The recommendations for improvement are determined to deal with future challenge based on interview result and literature and generated by comparing what project had done before and after the gap as mentioned in the problem statement.

Table 4. Proposed Solutions For Project Success Improvement

Issue	Performance Before Issue Encountered	Performance After Issue Encountered	Recent Challenge	Proposed Solution
Project alignment becomes more aggressive during project execution to catch up the gap between plan and actual progress.	Project meeting was conducted regularly in weekly basis attended by leaders from each team; project, construction, facility	Project meeting was conducted regularly in daily basis attended by leaders and team member from each team; project, construction, facility operation, business, and	Communication gap between working level across team during project execution is still occurred which will consume long coordination and agreement	<p>In-depth studies are required to obtain accurate solution on this challenge. But according to the respondent's answer, the researcher observed there is a missing line between management and working level, which may be caused by communication technique delivered by leader to the team member. So, the researcher propose some solutions to obstacle this challenge by:</p> <p>a. Leader should ensure the information is acknowledged by listen back to the</p>

	operation, business, and logistic	logistic.		receiver on what information they have accepted. b. Conduct project update meeting 2 times a day in daily basis to ensure all team members obtain the project update.
Site construction becomes more massive to fulfill site processing capacity demand.	Processing sites had been selected with minimum capacity 5000 m3 per area	Processing sites were constructed in scattered area with minimum capacity 1000 m3 per area to catch up demands.	Scattered area will consume long trip for equipment to mobilize.	Selecting proper processing site would need time and effort to define it. The researcher observed that processing site has potential risks that relate to external stakeholder (local community), so processing site selection should be taken carefully. Therefore, researcher would propose the project to develop risk assessment matrix on all sites that have been selected as potential processing site in order to obtain priority of site execution, which consider on several aspects as follows: a. Availability of land ownership documentation b. Far from residents and industry area c. Area is not included in forestry conservation d. Construction Feasibility e. Capacity area
Massive in constructing processing site make project requires more resources especially contractor to execute project construction. And also, it affects to the schedule since it depends on capacity fulfillment.	There were 2 shared-contractors assigned to handle E.P. project execution.	There were 2 shared-contractors and 1 dedicated contractor assigned to speed up project execution progress.	Shared-contractors still provide issue in speeding up construction progress. Even though, the issue of lack of equipment could be solved, but it will consume much time for coordination and agreement from other project.	According to the respondent's answer, the researcher observed that the equipment in speeding up construction progress was quite important. Since equipment along with the contractor, shared-contractors will make the progress is difficult to be speeded up. So, researcher would propose the project to obtain 2 dedicated and 1 shared contractor to handle E.P. project. Meanwhile, in term of efficiency, the project may share the dedicated contractors to other project with certain condition, which E.P. project is prioritized.

5. Conclusion

The objectives of this research are to acknowledge factors of project management process that are implemented in the Environment Phytoremediation project to attain project objective and identify kind of improvement to attain project success in the next year project. The conclusion refers to the research question, which have been analyzed and discussed based on respondent insights and researcher observations. In answering research question no. 1, the factors of project management process that had been done to achieve project's objective in 2020 were:

- a. Project Alignment
- b. Performing Risk Assessment and Mitigation
- c. Good Schedule and Resource plan

The recommendations of improvements are proposed to attain successful project objective in the next project year. The analyses have been conducted to answer research question no. 2 based on interview results, literatures and journals. There are 3 proposed recommendations defined as follows:

- a. In order to solve the communication gap issue across team in working level, the project could improve the communication techniques and frequency of meeting from leaders to team members, which can be conducted as follows:

- Leader should ensure the information is acknowledged by listening back to the receiver on what information they have accepted.
 - Conduct project update meeting 2 times a day in daily basis to ensure all team members obtain the project update.
- b. In order to define proper site to obtain effective mobilization, the project could develop risk assessment matrix on all sites that have been selected as potential processing site in order to obtain priority of site execution by considering the following aspects:
- Availability of land ownership documentation
 - Far from residents and industry area
 - Area is not included in forestry conservation
 - Construction Feasibility
 - Capacity area
- c. In order to solve lack of equipment due to shared-contractor, the project should obtain 2 dedicated and 1 shared-contractor to handle E.P. project. So, the project could obtain dedicated equipment to speed up execution progress smoothly.

The authors have also prepared several activities with time line and priority matrix to describe further details of an implementation plan with regards to the recommendations described above.

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Biography

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