

The Influence of Project Risk Management on Project Sustainability: A Case Study of Price Project, Kicukiro District

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Abstract: *This research intended to establish the contribution of risk management on project sustainability and was carried out in PRICE project in ministry of Agriculture as the case study with the following objectives; to assess the contribution of risk avoidance to the sustainability of PRICE project, to examine the effect of risk mitigation on sustainability of PRICE project, to evaluate the influence of risk transfer on the sustainability of PRICE project and to find out the role of risk retention on the sustainability of PRICE project. The researcher reviewed literature related to the contribution of risk management on sustainability of projects where it was indicated that risk management is vital in ensuring sustainability of projects. The research design used was descriptive based on qualitative and quantitative data. The population of the study was 290 project employees while the sample size was 168 respondents selected using purposive and simple random sampling techniques. Data was collected using questionnaires and interviews for primary data while for secondary data documentary review was done. In ensuring validity and reliability pretesting of research instruments was done before data collection. The collected data was presented using tables and analyzed using SPSS program. The researcher found out that risk retention strategies are practiced in PRICE project to ensure that they become sustainable through risk management; there are various forms of risk management in PRICE project that are relevant in improving project sustainability and that risk retention strategies are vital enough to improve sustainability hence confirming that risk retention strategies facilitate project sustainability. The contribution of risk transfer on PRICE project to contribute to project sustainability are insurance policies, indemnification agreements and releases and waivers. Risk transfer facilitates sustainability in PRICE project through affiliating improvements in being risk averse. The researcher recommended that employees of various projects in Rwanda should work hard to ensure that costs related to risk management are minimized.*

Keywords: Project risk management, project sustainability

1. Specific Objectives

The specific objectives of the research were the following:

- To assess the contribution of risk avoidance to the sustainability of PRICE project
- To examine the effect of risk mitigation on sustainability of PRICE project.
- To evaluate the influence of risk transfer on the sustainability of PRICE project.
- To find out the role of risk retention on the sustainability of PRICE project

The influence of risk avoidance to the sustainability of projects

Risk avoidance and mitigation responses involve additional tasks that will help reduce the likelihood of the risk event and mitigate its impact. This strategy attempts to eliminate the root causes of the risk event, which may be replaced with a lower risk event. This means that while the downside associated with a risk is reduced, its upside will be maintained, the situation when the original risk did not occur. Such responses include avoiding a low cost but unfamiliar contractor, allocating more time for project tasks and building teams with backups for key persons (Serpell, 2015).

According to Martens & Carvalho, although the complete elimination of all risk is less probable, an approach of risk avoidance is put in place to divert as many threats as possible in order to avoid the expensive consequences of a

negative event. A risk avoidance method tries to minimize weaknesses that can turn into a threat.

Risk avoidance and mitigation can be accomplished through various ways: policy & procedure, training & education and technology implementations (Martens & Carvalho, 2016).

During a project's particular life cycle, there will be some times that the project management team and or the project management team leader will find themselves in a situation where they understand that a particular factor as to the project and or a particular facet of that project does in fact come with a set or series of other risks. After the confirmation of these risks, the project management team and or project management team leader must make an evaluation as to what the next action is going to be in trying to deal with and or reduce these risks (Rafindadi & Cekić, 2014).

Referring to Økland words, in some cases, the project management team and or project management team leader may take the decision that the risks are worth it due to the importance of the element in question, and or due to a lack of a another solution, in this case, it is known as risk acceptance. Nevertheless, in some cases, the project management team and or project management team may take the decision that the best way to proceed is to change the previous project management plan in a way that minimizes the risk. This is known as risk avoidance (Økland, 2015).

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Lately everyone, from government agencies to regulators to corporate board members, seems to be talking about the need for better, more effective, risk management, the concept of risk management effectiveness still remains vague. Integrating risk into decision making, one of the most important tests of true risk management effectiveness is the level of risk management integration into decision making. Companies capable of systematically integrating risk management into planning and budgeting decisions, investment decisions, core operational business processes and key supporting functions, achieve long-term sustainable advantage. Just consider an example of a large investment fund, which makes investment decisions only after an independent risks analysis and does simulations to test the effect of uncertainty on key project assumptions and forecasts (Oliva, 2016).

It is critical to have a strong risk management culture for an effective risk management according to Sánchez. If we consider an example of a large petrochemical company, which normally use an online and face-to-face training for all the staff to be aware of risk management and competencies. The company has also assigned resources to include risk management principles into the culture of the company. If we take another example of a government agency, which documented clear dialogue and share information about risks as one of their business values, which will later be shared with all employees (Sánchez, 2015).

For effective risk management another aspect to be considered is the readiness and capacity of an organization to put in archives and reveal risk-related information both internally and externally. Big companies don't only keep in archives the results of risk analysis in the internal decision-making processes, but they also reveal information regarding risks and their mitigation to relevant stakeholders, where suitable, in other external reports or on the company's website. It is key to remember that as real risk information may be sensitive and contain commercial secrets, the purpose of disclosing them should not be the risks themselves but on the risk management background, the executive commitment to managing risks, and the culture of the organization (Martens & Carvalho, 2016).

Risk avoidance is the abolition or evading a risk, or class of risks, by shifting the limits of the project. Its purpose is to reconfigure the project in a way that the risk disappears or is reduced to a tolerable rate.

According to Martens & Carvalho, the nature of the solution may be engineering, technical, financial, political, or whatever else that address the cause of the risk. Still, this should be done carefully so that evading one identified risk does not lead to taking on unidentified risks of even higher consequence (Martens & Carvalho, 2016).

Risk avoidance is an area in which quantitative and approximately risk assessments are needed. If we take an example, the project designers may choose solution 1 over alternative 2 because the cost of 1 is predicted to be less than the cost of 2, on a single-point basis. Nevertheless, quantitative risk analysis might show that 1 has more risk

than the alternative approach 2. The main purpose of quantitative risk assessment is to regulate if the predicted reduction in risk by changing from alternative 1 to alternative 2 is worth the cost variance (Økland, 2015).

Risk transfer is utilized often whereas risk avoidance is less utilized as a strategy for risk mitigation, the responsible people tend to think more of how they can pass the risk to someone else instead of thinking on how they can reorganize the project to avoid the risk. Nevertheless, risk avoidance is an approach that can be used by the people in charge to their benefit.

The effect of risk mitigation on sustainability of projects

According to Martens & Carvalho, risk Mitigation Planning (it used to be called Risk Handling) is the process that recognizes, assesses, chooses, and put in practice different options in order to put the risk to be at a certain level as per the given program limits and objectives. This comprises the details on what should be done, when it should be done, who is in charge, and the cost and schedule related. From these mitigation options the most suitable strategy is selected.

Martens & Carvalho continue by saying that the risk mitigation plan must include the type of mitigation strategy for each risk, it must be determined and the details of the mitigation defined. The purpose of the risk mitigation plan is to make sure that the risk mitigation is successful (Martens & Carvalho, 2016).

Risk mitigation planning is the process that recognizes, assesses, chooses, and put in practice different options in order to put the risk to be at a certain level as per the given program limits and objectives. Risk mitigation planning has a purpose of empowering the success of the program. It includes the particulars of what should be done, when it should be accomplished, who is in charge, and the capital required to implement the risk mitigation plan. The most suitable program approach is chosen from the mitigation options listed above and filed in a risk mitigation plan (Oliva, 2016).

According to Martens & Carvalho, the extent to which details are provided depends on the program life-cycle stage and the need to be spoken about. There has to be enough details to facilitate a general estimation of the strength required and technological abilities needed based on the system that is complex. Risks can come from numerous sources including uncertainty in financial markets, threats from project failures (at any stage in design, development, production, or sustainment life-cycles), legal liabilities, credit risk, accidents, natural causes and disasters, an attack from an adversary, or events of uncertain or unpredictable root-cause. There are two types of events i.e. negative events can be classified as risks while positive events are classified as opportunities. Several risk management standards have been established including the Project Management Institute, the National Institute of Standards and Technology, actuarial societies, and ISO standards. Methods, definitions and goals differ according to whether the risk management method is in the context of project management, security, engineering, industrial

processes, financial portfolios, actuarial assessments, or public health and safety (Martens & Carvalho, 2016).

As Hwang & Ng said, some of the ways to handle threats (uncertainties with negative consequences) comprise mostly avoiding the threat, diminishing the bad effect or the probability of the threat, moving all or part of the threat to another party. It also includes retaining some or all of the probable or actual consequences of a specific threat, and the contrary for opportunities (uncertain future states with benefits) (Hwang & Ng, 2013).

Good risk management elevates the conversation. It creates a point of discussion between project teams and key senior stakeholders, prompting them to discuss the difficult topics and deal with potential causes of conflict. Suppliers are involved in the conversations too, as risk responses necessarily touch on their activities. Including them in risk management discussions can create more positive working relationships with their key personnel, because they'll see that their success is tied to the success of the project and that there is willingness to work as a whole team to do something about it (Sánchez, 2015).

Project risk management means that contingency budgets can be more precisely estimated and rely less on the professional guesses of the project team. By integrating risk management into the agenda planning and cost planning can create situations to better inform what you should be budgeting in terms of extra time, resource and money. Knowing that risk is being actively managed sets an anticipation for project success. With the framework in place to deliver despite the identified risks, and open communication about the project's difficulties with senior managers, everyone begins work knowing that success is the expected outcome. With risks being actively traced and managed, the project team can maintain a focus on the critical outcomes.

Risk management supports this because it serves to point out where project outcomes may not be achieved, focusing the team on what to do about that particular concern to get the project back on track (Sánchez, 2015).

With risk management shining a light on the areas of challenge within a project, the team can move swiftly to deal with them, ensuring that actions are taken to mitigate the risk and deliver successfully. This prevents problems from being overlooked in the business of the day-to-day work on a project especially when those problems appear to be difficult to solve. This changes the whole mindset of the team: knowing they are working on something destined to deliver great results for the company improves morale, supports productivity and hopefully engenders an environment where success is achieved (Serpell, 2015)

The influence of risk transfer on the sustainability of projects

According to Hwang & Ng, the strategies of the risk transfer are to move the risk to another party. Because of this, the project manager is able to retain the positive and avoid the negative. Moving risk involves an extra cost as the other party that presumes the risk is willing to take the negative

side and expects to be rewarded for it. The risk has a value based on the cost that both sides has agreed on. This is like buying a call option, wherein the positive is maintained, while the negative is avoided. The price of the risk is the value of the call option price (Hwang & Ng, 2013).

According to Oliva in getting a cover there is an additional value, when the situations indicate that usual risk can occur, as that is when the risk premium will be at its maximum. If we take an example of where the risk aspects have a low or a high probability of happening, presuming the risk may be the cost-effective option, as the risk premiums that is required might be lesser. This strategy is to shift the burden or the load of the risk outcome to another party. This might mean giving up some control, but when something fails the project is not accountable (Oliva, 2016).

This approach may not work to protect the brand image if the product is associated with your organization. Even if the power supply vendor pays for all damages due to failures in their unit, the customer only knows that the product has failed and caused damage. Use this approach with caution. A conventional means to transfer risk to another organization is with the purchase of insurance. This may require a careful analysis of the presenting risks and probabilities yet is a viable option in some situations (Hwang & Ng, 2013).

Contract terms with suppliers, vendors, contractors, may provide a means to shift risk away from your organization. For example, if a power supply fails in an expensive server causing the loss of revenue for a customer, in typical situations, one might ask for and receive a replacement power supply or could require the power supply vendor to cover the cost of the entire server (which the power supply caused to fail) and the loss experienced by the customer (Martens & Carvalho, 2016).

Over the course of a project, there will be a number of times over the course of the project's respective life cycle that the project management team and or the project management team leader will find themselves in a position in which they realize that a particular component as to the project and or a particular facet of that project does in fact come with a set or series of inherent risk. After all of these likely and potential risks have been properly organized and categorized, it is up to the project management team and or the project manager to effectively determine the best way to deal with these risks. One of the more tried and true mechanisms in the efforts to deal with these multitudes of risks is to shift the impact and of risk from a given project away from the parties involved in the actual management, planning, development, or conducting of a given project, and instead move it to a third party, who would also be assigned with some potential ownership of the anticipated response (Martens & Carvalho, 2016).

Transferring risks in project management is very different but it doesn't have to be complicated. Before a manager can assess and transfer, he or she must ask what risk levels are. After risks have been identified and quantified, they must be managed. Through the core process of active decision making, a firm must decide whether it will control, retain, eliminate, or expand its exposures (Hwang & Ng, 2013).

Risk transfer is a risk management and control strategy that involves the contractual shifting of a pure risk from one party to another. One example is the purchase of an insurance policy, by which a specified risk of loss is passed from the policyholder to the insurer. Other examples include hold-harmless clauses, contractual requirements to provide insurance coverage for another party's benefit and reinsurance. When done effectively, risk transfer allocates risk equitably, placing responsibility for risk on designated parties consistent with their ability to control and insure against that risk. Liability should ideally rest with whichever party has the most control over the sources of potential liability (Iqbal & Tamošaitienė, 2015).

According to Caron, risk control means suspecting a risk and taking the steps to diminish, mitigate, or else manage its effect. Risk control can be considered as gathering data or having warning systems that deliver data to evaluate precisely the effect, or the exact time of a risk. If a warning of risk can be found ahead of time to act against it, then collecting information can be better to more concrete and to more costly actions. Risk control, just the same as risk avoidance is costly. In case the project is about starting and presenting a new product, and competition is considered as a risk, a solution to consider can be to quicken the project, even at some significant price, to diminish market risk by beating the opposition to the marketplace. This is an approach used in high-technology businesses. An illustration of a risk control method is to monitor technological progress on highly technical projects. The risk is that the assured scientific advance might not occur, demanding the use of a less required backup technology or to cancel of the project (Caron, 2013).

The role of risk retention on the sustainability of projects

Risk management planning needs to be a continuing effort that cannot stop after a qualitative risk assessment. Risk management includes planning ahead of time of how the main risks will be mitigated and managed once recognized. Therefore, risk mitigation strategies and precise action plans should be included in the project execution plan, or risk analyses are just so much a cover. Risk mitigation plans should describe the root causes of risks that have been identified and counted in earlier phases of the risk management process, evaluate risk connections and mutual causes, identify other mitigation strategies, methods, and tools for each major risk, assess and prioritize mitigation substitutes, select and allocate the resources required for specific risk mitigation alternatives (Iqbal & Tamošaitienė, 2015).

According to Oliva, in case you are able to identify some risks, they can easily be removed or reduced. Nevertheless, most risks are complicated to mitigate, especially risks with a high-impact and low-probability. Consequently, project directors should focus on the risk mitigation for long-term during the project (Oliva, 2016).

In case a project is considered to have a low level of uncertainty, according to Martens & Carvalho, the better solution is to proceed by helping the present value of the project to arise by completing it the soonest and thus obtaining its profits in a short period. Fixed-price contracts,

possibly with a timetable of performance encouragements, are convenient for this type of project. In general, projects that take a long-time are costly and deliver less value to the stakeholder. Most of projects take a long time than planned, in part due to slow decision-making processes and the absence of a mind of urgency (Martens & Carvalho, 2016).

When a project has unbalances, to accelerate the process may not be ideal. In these kinds of projects, to change the scope and a repetition of the design are the norm, not an exemption. Supervisory issues also can be a productive source of uncertainty that can cause theoretical project planning and design to reprocess often. For projects with a high level of doubt or uncertainty, fixed-price contracts may be unsuitable, but performance-based encouragement agreements can be used (Hwang & Ng, 2013).

When you fail to identify and get ahead of variations, uncertainty, and repetition in preparing schedules and budgets might lead to unsuccessful results. Methods and skills that are suitable to predictable projects often give poor results when applied to projects with great possibility for changes and with a high tendency to correct decisions. For these projects, a flexible decision-making method may be more positive. Often this approach may seem contrary to experience with conventional projects. The use of unconventional methods to manage uncertainty requires the active support of senior managers (Økland, 2015).

According to Rafindadi & Cekić, risk buffering (or risk hedging) is some reserve formation or a barrier that captivate the influence of many risks without exposing the project.

Among examples of a barrier there is contingency that reduces the risk of a project running out of money before the project close. Buffering contains the distribution of extra time, manpower, machineries, and some other resources used in the project. This also mean having a bigger size of equipment or houses to give room for uncertainties in upcoming necessities (Rafindadi & Cekić, 2014).

According to Serpell, risk buffering is most of the times used by project workers and by the owners. The miscalculating of some measures of the project, man-hours, or other expenses is a form of buffering of safeguarding used by different project stakeholders. If people get jobs on the basis of lump-sum, offers with a fixed-price, in that case a cost buffering that is excessive can be disadvantageous to workers' ability to compete. A compensation can be made by contractors and sub-contractors by overvaluing a project or the duration of the activities. When you have an agenda of buffers, it permits the workers to change their staff and to allocate resources in different projects (Serpell, 2015).

Sample size

A sample size is part of the population, which the researcher considers to represent the rest of the population when carrying out the research. In determining the sample size of this research, the researcher will use Slovin's formula $n = \frac{N}{1+N(e)^2}$ where n is the sample size, N is the population and e is the sampling error (0.1)

$$n = \frac{290}{1 + 290(0.05)^2}$$

$$n = \frac{290}{1 + 290(0.0025)}$$

$$n = \frac{290}{1 + 0.725}$$

$$n = \frac{290}{1.725}$$

$$\mathbf{n = 168}$$

The sample size of this research was therefore be 168 respondents from PRICE project employees

2. Conclusions and Recommendations

The contribution of risk avoidance to the sustainability of PRICE project

The researcher found out that PRICE project is sustainable as a result of risk management that is practiced in the project, risks avoidance in PRICE project contributes to project sustainability through increasing project competitiveness and strengths and that risk management is a strong tool that is used in ensuring project sustainability.

The effect of risk mitigation on sustainability of PRICE project

It was established that risk mitigation facilitates sustainability in projects through increased compliance to internal controls and reduced project risks that would increase costs, there are various forms of risk mitigation in the project vital for project sustainability which include reducing costs, managing liability and planning for uncertainties and that risk mitigation has facilitated increase in project sustainability in PRICE project.

The influence of risk transfer on the sustainability of PRICE project

The researcher found out that risk transfer facilitates sustainability in PRICE project through affiliating improvements in being risk averse, risk transfer is high in PRICE project which is making the project more sustainable and indemnification agreements contribute to project sustainability in PRICE project through making the incurred losses better through spread of risks.

The role of risk retention on the sustainability of PRICE project

The researcher found out that risk retention strategies are practiced in PRICE project to ensure that they become sustainable through risk management, there are various forms of risk management in PRICE project that are relevant in improving project sustainability and that risk retention strategies are vital enough to improve sustainability hence confirming that risk retention strategies facilitate project sustainability.

2.1 Conclusion

The contribution of risk avoidance to the sustainability of PRICE project

The researcher concluded that the major contribution of risk avoidance on project sustainability are minimizes project costs, makes the project competitive, creates compliance within the project and increasing project strength. The

project is able to run independently, the project has capacity to run its activities successfully and that the project is efficiently run.

The effect of risk mitigation on sustainability of PRICE project

The risk mitigation strategies do consider most vital in project sustainability are structure activities, manage liability, reduce or limit risk and that plan for the uncertainties, risk mitigation facilitates sustainability in projects through increased compliance to internal controls and reduced project risks that would increase costs.

The influence of risk transfer on the sustainability of PRICE project

The contribution of risk transfer on PRICE project to contribute to project sustainability are insurance policies, indemnification agreements and releases and waivers. Risk transfer facilitates sustainability in PRICE project through affiliating improvements in being risk averse.

The role of risk retention on the sustainability of PRICE project

Risk retention strategies in price project are self-insurance, deductibles and handling risks appropriately. Risk retention strategies are practiced in PRICE project to ensure that they become sustainable through risk management

2.2 Recommendations

The researcher recommends that risk avoidance should be given much consideration in PRICE project because it makes the project sustainable.

The researcher further recommended that the effect of risk mitigation on sustainability of PRICE project should also be given much attention.

It is also recommended that the influence of risk transfer and the role of risk retention on the sustainability of PRICE project should be considered as well.

References

- [1] Bryman, A. & Bell, E. (2015). *Business Research Methods*. 4th edition. Oxford: Oxford University Press.
- [2] Bryman, A. (2015). *Social research methods*. 5th edition. Oxford University Press.
- [3] Caron, F. (2013). *Managing the Continuum: Certainty, Uncertainty, Unpredictability in Large Engineering Projects*. Milan: Springer.
- [4] Creswell, J. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*. Upper Saddle River, NJ: Prentice Hall.
- [5] Frigg, R. and Hartmann, S. (2012) Models in science. In: Zalta EN (ed) *The stanford encyclopedia of philosophy* (Fall 2012 Edition).
- [6] Hwang, B. & Chen, M. (2015). Sustainable risk management in the construction industry: *lessons learned from the IT industry*. *Technological and Economic Development of Economy* 21(2), 216–231.
- [7] Hwang, B. & Ng, W. (2013). Project management knowledge and skills for green construction:

- Overcoming challenges. *International Journal of Project Management*, 31(2), 272–284.
- [8] Iqbal, S. & Tamošaitienė, J. (2015). *Risk management in construction projects*. Technological and Economic Development of Economy, 21(1), 65-78.
- [9] Kibert, C.J. (2013). *Sustainable construction: green building design and delivery*. Hoboken, N.J.: Wiley.
- [10] Lankoski, L. (2016). Alternative conceptions of sustainability in a business context. *Journal of Cleaner Production*, 139, 847–857.
- [11] Maduka, N. & Udejaja, C. (2016). Implementing Sustainable Construction Principles and Practices by Key Stakeholders. *Modular and Offsite Construction Summit*. 1-8.
- [12] Martens, M. & Carvalho, M. (2016). The challenge of introducing sustainability into project management function: multiple-case studies. *Journal of Cleaner Production*, 117, 29–40.
- [13] Økland, A. (2015). Gap Analysis for Incorporating Sustainability in Project Management. *Procedia Computer Science*, 64, 103–109.
- [14] Oliva, F. (2016). A maturity model for enterprise risk management. *International Journal of Production Economics*, 173, 66–79.
- [15] Rafindadi, A. & Cekić, Z. (2014). Global Perception of Sustainable Construction Project Risks. *Procedia - Social and Behavioral Sciences* 119, pp. 456–465
- [16] Sánchez, M. (2015). Integrating sustainability issues into project management. *Journal of Cleaner Production*, 96, 319–330.
- [17] Saunders, M., & Thornhill, A. (2012). *Research methods for business students*. 6th edition. Harlow: Pearson Education.
- [18] Serpell, A. (2015). Evaluating risk management practices in construction organizations. *Social and Behavioural Sciences*, 194, 201 – 210.