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Assessment of Risk and Uncertainty in the Timely Completion of National Pride Construction Projects of Nepal

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Abstract: *Purpose: The major purpose is to assess and prioritize the influence of risk and uncertainty on project success along with significant factors that affect implementation of national priority projects.*
Design/Methodology/Approach: *The study included both qualitative and quantitative methods, and 20 government funded national priority pride projects were chosen for the study using a census sampling technique. Mean and standard deviation were used to analyze factors, correlation was used to study the relationship between risk-uncertainty management and project success, and multiple regressions was performed to identify the impact followed relative importance index to assess the factors beyond risk and uncertainty.*
Findings/Result: *The Risk Management is more important than uncertainty for construction project success. The statistical correlation between the components revealed that there was a significant relationship between Risk, Uncertainty, and Project Success. Risk is the strongest predictor and Uncertainty is the weakest predictor, with R value accounting for 58.6 percent, R square accounting for 34.4 percent, and adjusted R square accounting for 33.4 percent of overall deviation in Project Success, with the remaining percentage explained by other 52 factors. The factors affecting implementation of national priority construction projects, the main factors as reported by the survey respondents includes sequencing of work according to schedule, ineffective planning and scheduling of project by contractor, financing by contractor during construction, variation orders, hire of incompetent sub-contractor, poor supervision and poor site management, unusual low bid by contractors, budget allocation, design error due to unfamiliarity with the local conditions, environment and the materials and unavailability of competent staff.*
Originality/Value: *The study contributes for Developing the Framework for Timely Completion of Government Funded Construction Projects of Nepal*
Keywords: *Risk, Uncertainty, Project Success, Factors of Project delay, National Priority, Pride, Project*

1. INTRODUCTION

Infrastructure construction is the basis of development of any country. Developed countries have invested a lot of time, effort and money for construction of these infrastructures and are enjoying the benefit. Developing countries on the other hand are putting their maximum effort to establish such infrastructures for the economic benefit out of it. Investment could range from thousands of dollars to billions as per the requirement and affordability. So, it is mandatory to complete small or large projects within the anticipated time and cost for its expected benefit. (Mishra, 2020: Mishra et al, 2021) [1&2] A country like Nepal has been criticized in most of the case for its under developed status in spite of viability of natural resources. A country which is facing financial gap in budget and fulfilling it through grants and loan from foreign aids Construction managers are expected to give best performance to assure society better infrastructure with expected project performance with in short span of time through risk management after identifying all factor affecting timely performance. (Mishra and Aithal, 2021) [4 &5]

Projects that are of priority level and involves large amount of money will definitely have public attention and political interest attached to it because of the associated effect on the environment, community and the budget. Hence, the projects are to be handled with care right after it is conceived. Risk and uncertainties must be recognized well in advance and appropriate measures are to be adopted to avoid time and cost overrun. (Mishra, 2018: Hemant Gain et, al, 2022) [5&6]

2. Statement of Problem

Many construction projects in the SAARC region have suffered and are suffering from the effect of project delay as per the research conducted on such countries. In this regard, Nepal is no exception in facing such challenges of non-completion of projects even of national priority level. Systematic risk management

practice may assure success of project. Will it be possible to produce zero delay projects with effective risk and uncertainty management only or others factors also affects? If yes, what are those? Among Risk and Uncertainty, which is better predictor of project success? (Mishra and Malik, 2017: Shrestha et al, 2020) [7&8] This type of questions are not answered yet need deep research in the area to produce a concrete guideline and monitoring mechanism for counteracting the effect of time overrun by scrutinizing the causes / factors of delay of all nature.

3. Objective

To analyze the influence of risk and uncertainty and prioritize other significant factors that affect implementation of national priority projects.

4. Statement of Hypothesis

1. Significant relationship between Risk, Uncertainty, and Project Success
2. Agreement in the ranking of factors affecting implementation of national priority projects in the views of different stakeholders

5. LITERATURE REVIEW

Developing countries experience delays in construction projects and are deprived from its use and thereby inability to adding economic benefits. Delay in simple words can be perceived as extra time taken to complete a project beyond its pre-defined duration. Cost overruns associated with the effects of delay / time overrun in similar manner be considered as the extra amount spent beyond the pre-defined or conceived cost in the beginning. Many studies have been conducted for finding the key reasons for project lengthening and ways to minimize it happening. Site, perplexity, unclear statement of the job, climatic condition etc. are the causes for project delay. External factors like government change, changes in the existing guidelines, law are the factors which affect the smooth execution of a project. [9, 10, &11]

Studies undertaken for residential building projects in Cambodia by Serdar Durdyev et.al, 2017 [12] through questionnaire survey revealed 31 factors contributing delays. Causes that poses problem in the Cambodian construction are insufficient construction materials and experienced manpower at project location, improper time schedule of the project, delay in the delivering of construction materials, unavailability of experienced site workforce, complex nature of project, frequent absence of labors, effect of rain, addition or modification of items after the start of the work by the client, sub-contractors inability to perform the work in time and accidents due to non-compliance of safety measures are the major factors causing delay.

Similar studies regarding the causes of delay of building construction projects in Egypt revealed that contractor's insufficient cash flow, late payment of accomplished work to contractors, addition or modification of the previously defined job and receipt of only some percentage of bill amount at the time of construction from the client and consultant, adoption of non-professional method of construction and management, delay in providing materials at site, lack of proper communication among stake holders, more time taken for giving approval by the client, mismatch of the time schedules among various sub-contractors, time taken for preparing working / shop drawings and samples of material impart delay. (M. E. Abd El-Razek, H. A. Bassioni, and A. M. Mobarak, 2008) [13] It was not much difference in Nigeria and Saudi Arabia also. [14, 15, &16]

A review of previous studies done by different authors in order to ascertain the critical factors that are associated with increase in project completion cost and extension of time beyond the deadline has been undertaken by Chidambaram Ramanathan, SP Narayanan and Arazi B Idrus (2012) [17] for construction projects of Sabah East, Malaysia. Author stated that contractor's insufficient cash flow, addition or modification of the previously defined job, adoption of non-professional method of construction and management, insufficient payment made to the contractor for accomplished works, insufficiency of required fund for the project and lack of adequate experience of contractors are the important contributing factors for delay in the developing countries.

Similarly, inappropriate schedule of plan by the contractor, managing the site inferiorly, lack of adequate experience of contractors, insufficient fund of owner for making payments of accomplished work to the contractor, mismatch of the time schedules among various sub-contractors, delay in providing materials at site, problems in arranging workforce at site, unavailability of machine/equipment and its breakdown, lack of proper communication among stake holders and errors at the time of construction are the root causes of delay in Malaysian construction sphere. (Murali Sambasivan and Yau Wen Soon, 2006: Yusuwan N.M, Adnan H. 2013) [18&19]

The factors that contribute the most towards cost overrun are design lapses, escalation of material cost,

inappropriate schedule of plan, addition or modification of work after the start of the work, errors in designs, inappropriate time interval estimated for completion of project, unstable government due to unrest in politics, aspects related to existing law and disagreement between parties involved, entering into contract on the basis of lowest bid, managing the site inferiorly and inadequate monitoring. (Rodrigo F. Herrera et.al, 2020: Mishra, A.K., 2019) [20&21]

Study conducted in United States suggests that addition or modification of previously defined items/job after the start of the work by the client, more time taken for giving approval by the client, errors in designs, time consuming design approval process by the client, discrepancies in the documents related to contract, insufficient time duration of bidding, time consuming process for receiving formal authorization documents and acquiring permission for environmental and right of way etc., complex nature and unclear design of the work, lack of proper communication and synchronization by the client with other stake holders, time consuming process for furnishing design details by consultant are the sources of delay. (Mohammadsoroush Tafazzoli and Pramen P. Shrestha, 2017) [22]

As per the study of time and cost overrun for the construction project of building in Ghana (Emmanuel Bentil et.al., 2017) [23] revealed that late payment of accomplished work by the client, delay in providing materials at site, addition and/or modification of previously defined items/job after the start of the work by the client, escalation in unit cost, contractor's insufficient cash flow, insufficient formulation of course of action and cash flow management and its supervision, errors in designs and it's modification, wrong assumptions in formulating less cost/budget at first hand, improper detailed design and formulation of course of action at the time of budget preparation, legal demand for additional time and cost adjustment contribute for the cost and time overrun.

Addition or modification of previously defined items/job after the start of the work by the client, insufficient fund of owner for making payments of accomplished work to the contractor, more time taken for giving approval by the client, unexpected changes in the underground soil strata, late payment of accomplished work by the client, lack of workforce at site, discrepancies in the design are the causes of time overrun as established. Aftab Hameed Memon (2014) [24]

Studies conducted by Mishra, et. al, (2018) and Sharma, et al, (2022) for construction projects under Town Development Fund of Nepal recognized that Arbitration, Litigation, Dispute arousal and Total abandonment are the four most important effects of delay. Further in the study, surprising fact encountered reveal that cost overrun is not significant in comparison to that of time overrun and a ceiling on time extension is found to be suggested which is currently in practice in Nepal. [25 & 26] A detail study on extension of time needs to be conducted separately. Similar studies on effects of delay in construction projects found out that delay has resulted in the lengthening of project duration, increase in the project cost at completion, disagreement, complete stoppage or leaving of the job, arbitration and litigation and complexity of extension of time. [26 &27]

Delay could affect different stake holders in different way. It is loss of revenue and loss of use of the proposed facility for a client, additional expenses on equipment and materials lost / spoiled, additional cost for hiring the labor and loss of time for a contractor. In general, it is a loss of time, capacity and loss of income. (M. Haseeb, Xinhai-Lu, Aneesa Bibi, Maloof-ud-Dyian, Wahab Rabbani, 2011) [28] Similar studies on the effects of delay by D. Aydin, E. Mihlayanlar (2018) [29] revealed that the construction company will lose jobs due to bad reputation as it will lose its credibility among the potential clients. The outcome of delay is assessed as bad reputation, time overrun, cost overrun, total abandonment, low quality work, dispute, litigation, arbitration in the context of Turkey.

In order to minimize or eliminate delay and cost overrun, recognition of risk, uncertainties and its possible points of origin becomes the first and foremost stage for management of risk. Risks involved in a project are categorized into three groups namely external, project and internal. External risks comprised of political, economic, social and weather risks. Similarly, project risks come into picture due to time, cost, work quality, construction and technological risks. Internal risk on the other hand, involves resource, project member, construction site and document and information risk. Therefore, it is important to establish the seriousness and the possible chances of happening of risk through detailed estimation. Once the risk factors are established, ways of mitigating or controlling it can be managed by adopting its identification, analysis, evaluation, response and monitoring (Adhikari and Mishra, 2020) [30]. There are ways to minimize and get rid of risk and uncertainty by taking into account choices such as commercial insurance, self- insurance, merger and diversification. (Fisk 2003, Li and Liao 2007, Conchie and Burns 2008, Han et al. 2008, Mitkus and Sostak 2008) [31][32][33][34][34]

6. MATERIALS AND METHODS

The current research is purely descriptive and mixed method in nature. The research was carried out at government funded national priority projects. To tackle the research challenge, the researchers gathered primary data. Secondary data, on the other hand, was utilized to explain and justify the study's findings. The respondents were chosen using a convenient sample technique. The structured question was delivered once the consent was signed and the study purpose was explained. A survey was performed till July, 2022. The data was analyzed using the SPSS (20 versions) software utilizing Frequency, Percentage, Mean, Standard Deviation, Correlation, and Regression analysis. Cronbach's Alpha was employed to verify the data's reliability since it is one of the most essential instruments for ensuring data's internal consistency.

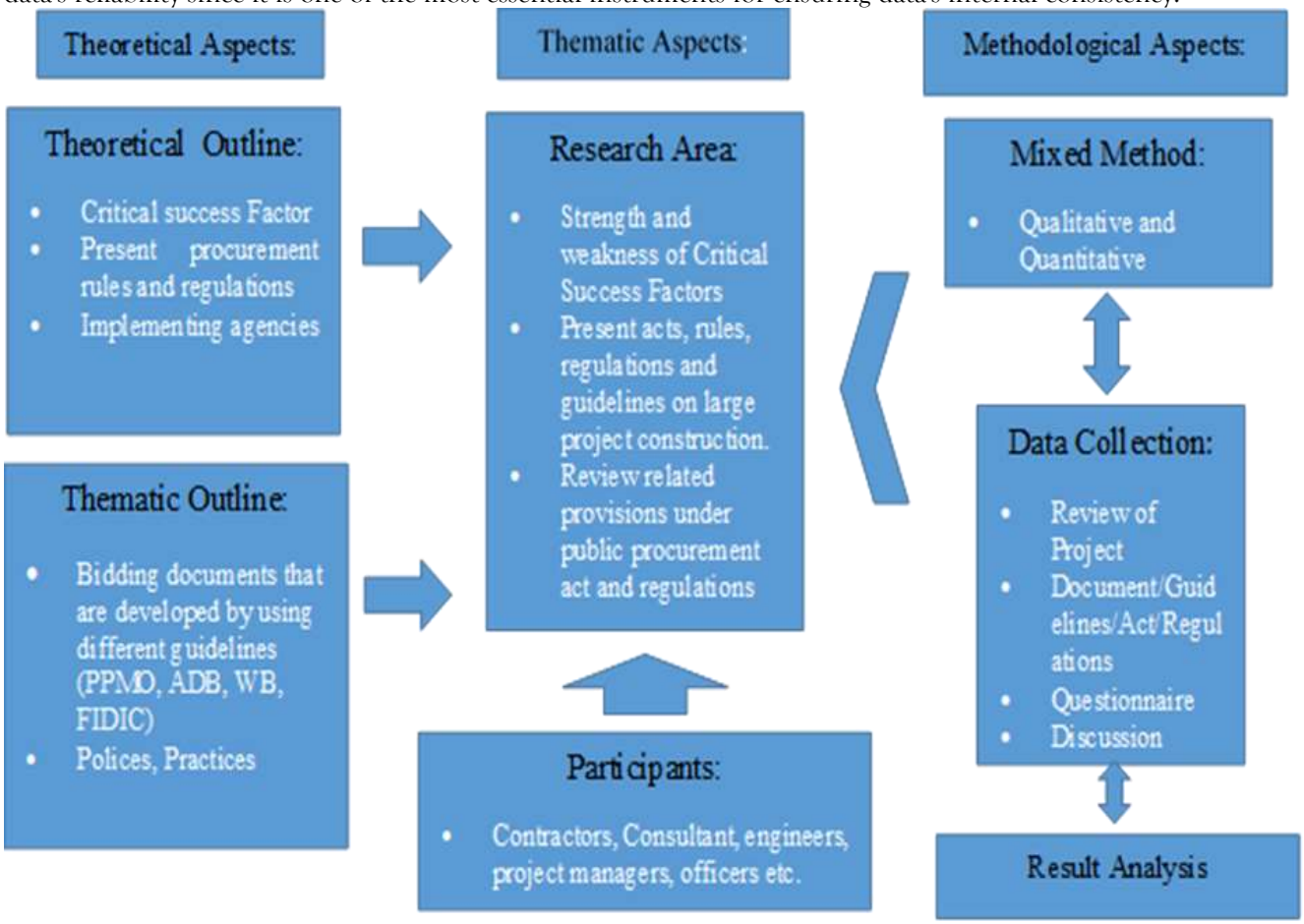

Fig. 1 Conceptual Frame Work

The study is continuity of same framework. The participants of the national priority projects were consulted for the study Viz; Contractors' engineer and Consultant for schedule questionnaire survey. The response rate for questionnaire survey is shown in Table 1.

Table 1 Nos. of respondents for questionnaire survey

Targeted Respondents	Population(N)	Sent	Received	Rate of Return (%)
Employer	60	60	44	73.3%
Contractors	60	60	48	80%
Consultant	60	60	46	76.7%

6.1 Data Collection

Both primary and secondary data were collected for this research.

6.1.1 Primary Data

The primary data for the study was obtained by:

a) Key Informant Interview: The opinion of the experts was taken as key informant interview with senior divisional Engineer, Project Engineer and Contractors' engineer of the district to find the practical issues related to performance of the project.

b) Questionnaire Survey: Questionnaire were developed in such a way that it included participants from clients, contractors and consultants.

6.2 Validity of Research Tools

The Value of Cronbach's alpha (α) was 0.948. It slows all the indicators taken for assessment of success factor affecting the performance of large construction project measure the same underlying concept. Thus, the data that has been used for this research was valid and reliable.

Table 2 Cronbach's alpha

Nos. of factor (K)	Sum of individual variance $\sum_{i=1}^{52} \sigma_{yi}^2$	Variance of total score σ_x^2	Cronbach's alpha $\alpha = \frac{K}{K-1}\left(1 - \frac{\sum_{i=1}^{K} \sigma_{yi}^2}{\sigma_x^2}\right)$
52	40.824	583.148	**0.948**

6.3 Data Analysis

Likert Scale was used for assessing the success factor affecting the performance of large construction project and transformed to relative importance indices (RII) for each of the factors.

6.4. Relative Importance Indices

To find the rank of the factors Likert scale was used to find the result. The five-point scale ranged from one to five was adopted and transform to relative importance indices (RII) for each factor as follows [2,9 &25]: RII = ΣW / (A*N)

Where, W was the mentioned scale for rating a factor by the respondents which ranges from 1 to 5;(1-Strongly disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly agree)

A was the highest weight in the scale; N was the total number of respondents

Null Hypothesis (H0):

There is no agreement in the ranking of factors affecting implementation of national priority projects between two groups of respondents.

Alternative Hypothesis (HA):

There is agreement in the ranking of factors affecting implementation of national priority projects between two groups of respondents.

Spear's rank correlation coefficient between clients and consultant view is given by:

$$p = 1 - \frac{6\sum d^2}{n(n^2 - 1)}$$

Where,

di = difference between the two ranks of each questionnaire and

N = Number of questionnaires

At the level of confidence 95% [11,2, & 26]

7. RESULTS AND DISCUSSION

7.1 Association between Project Risk-Project Uncertainty Management and Project Success

The statistical association between the factors assures that there was a significant association between the management of risk, uncertainty, and project success since the p value of each relationship was less than.01 significant levels. Pearson correlation was positive in each relationship, indicating that adjustments in one factor can have a beneficial influence on other factors as well. As a result, it is proposed that if Risk and uncertainty management directly influence on construction project success, even previous studies have also found formal risk management is most for conforming project success. [5,7,8, & 30]

7.2 Effect of Risk and Uncertainty Management on Project Success

The predictor Risk has a beta value of (=0.467) while the predictor Uncertainty has a beta value of (=-0.221). It indicates that both Risk and Uncertainty have an impact on Project Success. Among them, Risk is shown to be the strongest predictor while Uncertainty is determined to be the weakest predictor. This is similar findings as of previous studies particular for different types of building, roads and airport projects. [5,7,8, &30]

The results (F =34.317, p-value for F=0.000) indicate that the model is significant because the p-value is less than 1%. It indicates that both predictors have a considerable combined influence on Project Success.

R value (R=0.586, F=34.317) backs it up. It claims that these two predictors account for 58.6 percent of the overall Project Success, with the remaining 41.4 percent explained by other factors not examined in this study. R Square value (R2=0.344, F=34.317) also supports it. It claims that these two predictors account for 34.4 percent of the overall deviation in Project Success, with the remaining 65.6 percent explained by additional characteristics not examined in this study. To put it another way, these Risk-Uncertainty management account for 34.4 percent of the deviation in Project Success.

Since adjusted R Square is derived by changing sample size and number of predictors, it is a better indicator of a model's goodness of fit. Essentially, it allows for comparison of the R Square values of models with varying numbers of independent variables and predictors. The result of Adjusted R Square is 0.334, indicating that 33.4 percent of variations in the dependent variable, project success (Predicted), can be explained by the two independent variables (Predictors). Sixty six percent of the variance is accounted for factors not examined yet for which second questionnaire related to factors should be studied.

7.3 Significant factors affecting implementation of national priority projects

Table 3 summarizes the computed RIIs and their ranks as perceived by the contractors, employers, consultants and their combined opinion According to contractors' perception financing by contractor during construction was the most important factor affecting implementation of national priority project among all factor with relative index (RII) = 0.867.Poor supervision and poor site management was the second important factor with RII = 0.827 and sequencing of work according to schedule was the third important factor with RII = 0.827. Similarly hire of incompetent sub-contractor, variation orders, budget allocation, shortage of material, technical skill of the project staffs, and escalation of material prices, employee's motivation were other significant factors affecting implementation of national priority projects as respondent by contractors.

Table 3 The top significant factors affecting implementation of national priority projects

Significant factors that affect implementation of national priority projects	Contractor's opinion		Employer's opinion		Consultant's opinion		Combined opinion	
	RII	Rank	RII	Rank	RII	Rank	RII	Rank
Sequencing of work according to schedule	0.827	2	0.814	1	0.800	8	0.815	1
Ineffective planning and scheduling of project by contractor	0.787	11	0.743	11	0.900	1	0.810	2
Financing by contractor during construction	0.867	1	0.800	2	0.750	25	0.810	2
Variation orders	0.827	2	0.786	4	0.800	8	0.805	4
Hire of incompetent sub-contractor	0.827	2	0.757	8	0.783	12	0.790	5
Poor supervision and poor site management	0.827	2	0.786	4	0.733	32	0.785	6
Unusual Low bid by contractors	0.787	11	0.700	28	0.850	2	0.776	7
Budget allocation	0.813	6	0.860	6	0.767	18	0.771	8
Design error due to unfamiliarity with the local conditions, environment and the materials	0.760	20	0.757	8	0.800	8	0.771	8
Unavailability of competent staff	0.707	38	0.800	2	0.817	6	0.771	8

According to employers' perception sequencing of work according to schedule was the most important factor affecting implementation of national priority projects among all factor with relative index (RII) = 0.814. Financing by contractor during construction was the second important factor with RII = 0.800 and unavailability of competent staff was the third importance factor with RII = 0.800. Similarly poor supervision and poor site management, delay of work approval during construction by consultant, variation orders, political and social environment, hire of incompetent sub-contractor, design error due to unfamiliarity with the local conditions, environment and the materials, slow response and poor

inspection were other significant factors affecting implementation of national priority projects as respondent by employers.

According to consultants' perception ineffective planning and scheduling of project by contractor was the most important factor affecting implementation of national priority projects among all factor with relative index (RII) = 0.900. Poor communications by the contractor with the parties involved in the project was the second important factor with RII = 0.850 and unusual low bid by contractors was the third important factor with RII = 0.850. Similarly improper quality control of materials, differing site (ground) conditions, inefficient quality control by the contractor, unavailability of competent staff, sequencing of work according to schedule, variation orders, design error due to unfamiliarity with the local conditions, environment and the materials were other significant factors affecting implementation of national priority projects as respondent by consultants.

According to combined perception of employers, contractors and consultants, sequencing of work according to schedule was the most important factor affecting implementation of national priority projects among all factor with relative index (RII) = 0.815. Ineffective planning and scheduling of project by contractor was the second importance factor with RII = 0.810 and financing by contractor during construction was the third important factor with RII = 0.810. Similarly, variation orders, hire of incompetent sub-contractor, poor supervision and poor site management, unusual low bid by contractors, budget allocation, design error due to unfamiliarity with the local conditions, environment and the materials and unavailability of competent staff were other significant factors affecting implementation of national priority projects as respondent by employers, contractors and consultants.

7.4 Agreement on factors affecting implementation of national priority projects

To find whether there was agreement or disagreement on the attitude of the stakeholders towards factors affecting implementation of national priority projects, the respondent's response was tested for correlation using Spearman rank correlation coefficient, to see there was difference in ranking between two groups of respondents i.e., employer versus contractor, contractor versus consultant and consultant versus employer. In order to decide whether to accept or reject the Null Hypothesis, the level of confidence 95% is used. This allows to state whether or not there is "agreement" between respondents response. If the calculated value of Rho is greater than the critical value, H0 is rejected, i.e., there was evidence of a statistically significant agreement between the groups. If the calculated value of Rho is less than the critical value, H0 is accepted, i.e., there was no evidence of a statistically significant agreement between two groups.

Table 4 Summary of correlation test on factors affecting implementation of national priority projects

Respondents	Calculated Value of Rho	Critical Value of Rho	Reject or Don't Reject Null Hypothesis
Employer Vs. Contractor	0.658	0.274	Reject
Contractor Vs. Consultant	0.280	0.274	Reject
Consultant Vs. Employer	0.322	0.274	Reject

In this case with the level of confidence of 95%, the calculated value of Rho is greater than the critical value of Rho, so the Null Hypothesis is rejected i.e., so the hypothesis that there is no significant agreement between the respondents is rejected. Thus, it can be concluded that there is strong correlation between the attitudes of the respondents. This means that most of the respondents have the same perception about factors affecting implementation of national priority projects.

Construction of irrigation system, network of road transportations, fresh water supply, habitat and adequate electric power plays an important role in the upbringing of the economy of a country. Agriculture and tourism are the main income generating business which affects the GDP of Nepal. Hence, Government of Nepal had listed 24 projects (started with 17 projects but later 7 more projects were added) as national pride projects that are to be monitored closely for its progress and focus on timely completion in order to achieve overall economic growth of the country in the Fiscal Year 2068/2069 BS (i.e., 2010/2011 AD). The projects are so chosen that it covers the field of irrigation, fresh water supply, roads and air transportation network, generation of electricity and conservation of natural resources. Despite the efforts put on the timely completion, there are delays that accounts for cost overrun.

7.5 Status of National Pride Projects of Nepal

In order to review different aspects including the physical and financial progress of the 24 national pride projects, sub-committees were formed on 28 Poush, 2077 BS (12th Jan, 2021) by the National Concern and Co-ordination Committee. The current status, at the end of 10 years, of all the 24 projects is as stated below and as per the review; the overall physical progress seems unsatisfactory.

7.5.1 Postal Highway Project

This project was planned to connect all the plain terai districts from eastern part to western part of Nepal by constructing 1792 kilometer of road and 219 numbers of bridges. Only 868 kilometers of road is black topped and 115 bridges are completed so far. Physical progress of this project is 68%.

7.5.2 PushpaLal Mid Hill Highway

This project was envisaged to connect the middle hill areas along the length from eastern part to western part by constructing 1879 kilometers of road and 137 numbers of bridges. Only 1249 kilometer of road is black topped and 92 bridges are completed so far. 483 kilometers of road and 21 number of bridges are under construction. Procurement management of the remaining road and bridge construction is yet to start. Physical progress of this project is 77%.

7.5. 3 North South Koshi Corridor Highway Project

The project is meant to connect the hilly areas along the width from northern part to southern part by opening 162 kilometers of track for the road and 9 number of bridges. 148 kilometers of track has been cleared out of which 72.5 kilometers has been graveled and 6 bridges are constructed so far. Similarly, 14 kilometers of remaining track is under construction by Nepal Army. Physical progress of this project is 34%.

7.5.4 North South Kaligandaki Corridor Highway Project

In order to connect Gaindakot of Nawalparasi with Korala of North Jomsom of Mustang district, 186 kilometers of road construction by clearing track was proposed. The whole length of the track is cleared and 65-kilometer road is black topped along with the completion of 16 number of bridges. Physical progress of this project is 63%.

7.5.5 North South Karnali Corridor Highway Project

To connect Humla district with the national highway grid, 269 kilometers of road was proposed to be constructed. 261 kilometers of track is cleared along with the completion of 14 number of bridges. Remaining 8 kilometers of road is under construction. Physical progress of this project is 63%.

7.5.6 Kathmandu Terai Fast Track Project

In order to connect Kathmandu with Terai-Madhes in mid-eastern part of plain area, 72.5 kilometer of first fast track of Nepal was proposed. The construction of this project is going on at a fast pace but it will not be completed by the Fiscal Year 2026/2027. Physical progress of this project is 35%.

7.5.7 Railway and Metro Development Project

This project was proposed to construct east-west 946 kilometers of railway track and to connect big cities like Kathmandu, Pokhara, Birgunj. Physical progress of this project is 32%. The completion date of this project is uncertain.

7.5.8 Gautam Buddha International Airport

The main aim of the project is to upgrade the existing domestic airport and runway to international level airport of 3000 m by 45 m with new terminal building. It has been completed and came into operation from Jestha, 2079 BS respectively.

7.5.9 Pokhara Regional International Airport

This project was planned to upgrade the existing domestic airport and runway to international level airport. Physical progress of this project is 100% and came into operation.

7.5. 10 Second International Airport at Nijgadh

Proposed to construct new international airport to cater services to the ever-growing passenger numbers and to support tourism. Construction work cannot be started due to the non-availability of modality of execution.

7.5.11 Sikta Irrigation Project

The project was envisaged in order to provide irrigation facilities to 42766 hectares land in the Rapti area. Physical progress of this project is 40%.

7.5. 12 Babai Irrigation Project

The project was planned to provide irrigation facilities to 36000 hectares land in the Bardiya District. Physical progress of this project is 70%.

7.5. 13 Ranijamara Kulaiya Irrigation Project

The project was planned to provide irrigation facilities throughout the year to 38300 hectares land in the Bardiya District. Physical progress of this project is 67%.

7.5. 14 Sunkoshi Marine Diversion

This project was proposed to mix the water mass of Sunkoshi River to Marine River in order to provide irrigation facility for the total 122000 hectares of irrigable land of Bara, Rautahat, Sarlahi, Mahottari and Dhanusa districts. The speed of construction is faster than other projects. Physical progress of this project is 34%.

7.5. 15 Bheri Babai Diversion Multipurpose Project

Project was proposed to provide irrigation facilities to 51000 hectares land in the Surkhet, Bardiya & Banke Districts; to generate 48 MW of hydropower and managing conservation of Water Resources in the area. Physical progress of this project is 63%.

7.5. 16 Mahakali Irrigation Project

The project was included in the list of national pride on the Fiscal Year 2077/078 BS and will provide irrigation facility to 33520 hectares of irrigable land of Kailali and Kanchanpur district. The construction works up to the chainage of 12690 of main Tanakpur irrigation canal is completed and the remaining work is in construction phase. Physical progress of this project is 19%.

7.5.17 Upper Tamakoshi Hydropower Project

This project was planned to generate 456 MW of hydropower to cater the shortage of electricity. It has been completed and came into operation from Asar, 2078 BS.

7.5.18 West Seti Hydropower Project

Proposed to generate 750 MW of hydropower to cater the domestic need and to export it to the neighboring countries. Construction work cannot be started due to the non-availability of modality of execution.

7.5. 19 Budi Gandaki Hydropower Project

Proposed to generate 1200 MW of hydropower to cater the domestic need and to export it to the neighboring countries. Construction work cannot be started due to the non-availability of modality of execution.

7.5.20 Lumbini Area Development Project

The project is envisaged to develop Lumbini area into a well-managed religious, cultural and tourist destination. The project cannot be completed as per the master plan due to the non-provision of budget. Physical progress of this project is 87%.

7.5.21 Pashupati Area Development Project

The project is envisaged to develop Pashupati area into a well-managed religious, cultural and tourist destination. The project cannot be completed as per the master plan due to the non-provision of budget. Physical progress of this project is 67%.

7.5.22 Melamchi Water Supply Project

The project was envisaged to minimize the acute shortage of fresh drinking water to the people of Kathmandu valley by supplying 17 crore liters of water per day. The project was almost completed and came into operation last year but was shut down due to the effect of severe flood in the region. Physical progress of this project is 98.5%. It will also come in full operation in a short period.

7.5.23 Electricity Transmission Line Project

The project is proposed to be funded and constructed under Millennium Challenge Corporation. Transmission line will be constructed connecting Lapsefedi of Kathmandu to Galchhi-Ratamate of Dhading and Damauli-Bharatpur-Butwal. Physical progress of this project is 8%.

7.5.24 Chure Conservation Program

Project was proposed to develop new nursery area, create proper habitat, conserve water and natural resources. Construction work cannot be undertaken due to inadequate budget. Physical progress of this project is 6%.

Review of the project reveals that the progress of national pride is not satisfactory (Tribikram Parajuli, Radhesh Panta) except the two projects. Management and execution of the projects is not taken seriously considered as simple projects without giving priority. Special policies should be formulated for the execution of these prestigious projects with the provision of one window policy. It carries no meaning of blaming procurement law and regulations as the reason for the delay. Strict measures and close co-ordination among different stake holders are essential measures for the timely completion of these projects.

8. CONCLUSION:

The major focus of the study is to determine the influence of Risk-Uncertainty Management on Construction Project Success. The findings revealed that respondents believe Risk Management is more important than uncertainty for construction project success. P value of each interaction was less than 0.01 significant levels, the statistical correlation between the components revealed that there was a significant relationship between Risk, Uncertainty, and Project Success. Risk is the strongest predictor and Uncertainty is the weakest predictor, with R value accounting for 58.6 percent, R square accounting for 34.4 percent, and adjusted R square accounting for 33.4 percent of overall deviation in Project Success, with the remaining percentage explained by other 52 factors.

The factors affecting implementation of national priority construction projects, the main factors as reported by the survey respondents includes sequencing of work according to schedule, ineffective planning and scheduling of project by contractor, financing by contractor during construction, variation orders, hire of incompetent sub-contractor, poor supervision and poor site management, unusual low bid by contractors, budget allocation, design error due to unfamiliarity with the local conditions, environment and the materials and unavailability of competent staff. Most of the respondent have the same perception about factors affecting implementation of national priority projects validate the research through the spears man rank correlation also. The status of all national priority projects highlights the strong implementation of not only risk and uncertainty management only but also that of all significant high rank factor affecting implementation as risk may managed only if factor affecting implementation are known.

9. Recommendation

9.1 Recommendation for the Government

Government is the important key role player in public construction projects. The recommendation for the government is as follows:

1. Government should develop the process of budget release based on technical job specification rather than only accounting administrative system for approved projects.
2. Government should develop guidelines for monitoring multiyear national priority projects and its concrete implementation.
3. Government should develop guidelines for estimation of construction time for national priority works so that realistic contract duration imposed by client.
4. Government should amend in public procurement act regarding transparent expenditure of advance mobilization and award process to lowest responsive substantially evaluated bidder.

9.2 Recommendation for the Clients

Clients, being a government authority are also the most important key player of construction industry. Client's responsibilities and authority is higher for good performance of national priority projects. The recommendation for the Clients is as follows:

1. Clients should strictly keep continuous coordination communication with consultant and end users during the project conception through survey and up to design of the project. This will help to address the design requirement of client and end users demand.
2. Clients should properly study DPR funding assurance submitted by consultant, making presentation to consultancy of each portion of the design by individual manpower, prepare bidding documents with care such that selection criteria for contractor should be such that experience, financial standing, expertise and professional contractors should be at construction site before inviting bids. This helps to avoid errors and omissions that consequently help in reducing change order and disputed.
3. Client should strictly take action against contractor who uncared the project progress and unable to complete in stipulated time.

9.3 Recommendations for the Consultants

Consultants are another important key player of construction industry as they translate the clients' needs and ideas in to plans and drawings and supervise the translation of these plans and drawings into visible physical structures. The recommendation for the Consultants is as follows:

1. Standard specification and drawing should be followed along with compressive information required for easier interpretation of the drawing and setting out of works.
2. Consultant should issue instruction and make work approval in time.
3. Consultant should familiar with the local conditions, environment and the materials while designing

of national priority projects.

9.4 Recommendations for the Contractors

Contractors are one of the vital stakeholders of construction industry as they directly involved in the construction activities and their influence on project performance is higher. The recommendation for the Contractors is as follows:

1. Fulfill the contractual obligations strictly specially related to updating the work schedule with clear stating linked between the activities, deployment of experienced professionals, equipment and machines at the site, timely submission of necessary documents and guarantees to the client.
2. Mobilization amount should be used only on the specified projects through specific bank account operation.
3. Taking a project and giving project to other contractors who have no sufficient capacity to do the works should be stopped.
4. Enhancement of professional capacity of contractor in national priority projects to complete project in stipulated time and achieving intended quality.

10. Conflicts of Interest

The author has no conflict of interest. The research is conducted by first author under the joint supervision of second and third author.

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