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Sway of Resources Overrun with Risk Mitigation in Hills Construction

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ABSTRACT

In development industry danger plays a crucial role, each and every work is related with some chance factors. Especially in hilly construction tasks there are more than a few danger elements involved. The chance of danger prevalence is of useful resource factors and also via some exterior factors. These danger factors may additionally additionally lead to resources overrun in construction. This task gives the findings of questionnaire survey performed on the integral hazard elements affecting the profitable performance of hills construction in India in phrases of cost, time and quality. The fundamental risk factors in Indian hills constructions are exchange of scope of work, land acquisition delay, poor preliminary soil facts and investigations, time table prolong precipitated with the aid of rejection of unqualified substances and alternate orders by means of political pressure. The questionnaires are framed via the danger factors affects the assets in hilly construction. Based on the lookup the resources overrun due to the dangers are identified. Further, necessary threat factors had been explored thru Statistical analysis by using Chi-Square approach and categorized them in six factors viz. Financial risk, Technical risk, Socio political risk, Environmental risk, Construction danger and Logistical risk. The recognized factors will be beneficial to the area engineers for format of ideal chance mitigation approach for the duration of planning stage.

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1. INTRODUCTION

1.1. Construction management:

The construction industry is the important role in the economic growth of the country. In our country the construction industry major contribute in GDP it's around 19%. The construction industry involved in several types of construction project.

Construction is defined as creation, modernization, repair and demonization of the structures and the modification of the natural earth surface. Construction is translating the plans, designs, specifications and resources into the physical structure with some requirements for project.

In the hilly construction project are expenses resources are high compare to the plain construction for the build the particular structure. The reason for high expenses are Transportation charges is high, Procurement of materials and equipment's, Site levelling and other various factors.

1.2. Development of Hilly construction

Now a days the hilly construction is well developed. The development is made up due to the reason of population growth, Pollution and many environmental factors. Deprived of picturesque views, fresh air, and accessible flat lands in the cities, people finally started to resort to hilly regions searching for their perfect abodes.

Technical Risks	Incompletion of design, Improper Estimation details, Labours having less knowledge on equipment.
Financial Risk	Amount delay from Clients, Sudden increase in price of materials, Increase amount more than expected
Socio-Political risks	Amendments in governmental laws and regulations. Law and order, Increase in taxes & Payment failure by the government.
Environmental risks	Sudden natural disaster, Weather and seasonal impactuations
Construction & Management-related risks	Insecure camps for labours, improper Sequences of construction, Improper inspection of labour productivity details, Land acquisition
Logistical Risks	Availability of transportation facilities. Availability of equipment such as spare parts, fuel, and labour.

2. METHODOLOGY

In construction industry, planning and management is important to achieve its goal. The aim can be attained by sequencing the flow of work into a typical methodology. Fig. 2.1 represents the methodology adopted for successful completion of the project.

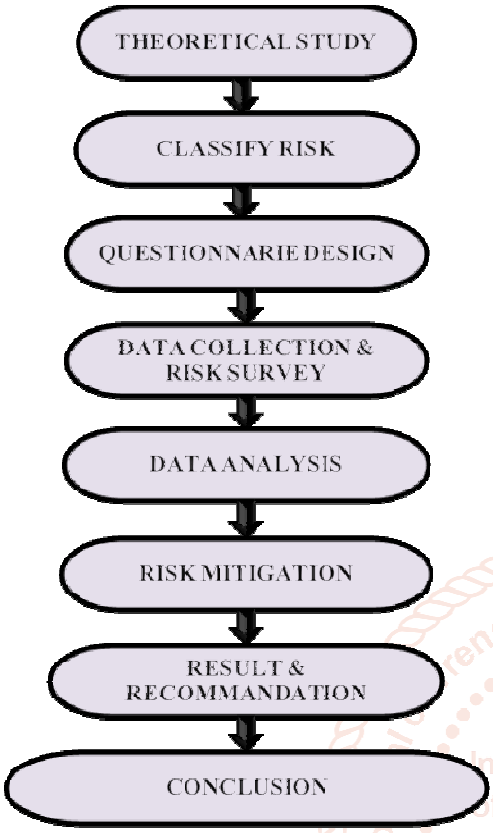

Fig. 2.1 Methodology Flow Chart

Using the questionnaires data's are collected from the experience engineers, project managers, and construction organisation worked in the hills. The risk survey is nothing but a field survey. In what way selected risk factors are affects the hill construction. These are collected by the interviews, direct approaches and also the Google Questions.

After identifying and classifying the risks, we are going to proceed with their analysis, that is, the possibility and the consequences of each risk factor are examined in order to establish the level of risk of our project.

3. DATA ANALYSIS

3.1. Introduction:

3.1.1. "**Statistical Analysis**" is a process of inspecting, cleaning, transforming, and modelling data with the goal of highlighting useful information, suggesting conclusions, and supporting decision. Here the two types of analysis process taken for the result comparison.

3.1.2. Chi-square analysis

Chi-square analysis in statistics is to test the goodness of fit to verify the distribution of observed data with assumed theoretical distribution. Therefore it is a measure to study the divergence of actual and expected frequencies.

The formula for computing chi-square is as follows.

$$Chi - Square = \sum \frac{(O-E)^2}{E}$$

The calculated value of chi-square is compared with the table of chi square for the given degrees of freedom at the specified level of significance. If the calculated value is greater than the tabulated value then the difference between the observed frequency and the expected frequency are significant.

$$Degree\ of\ freedom = (R-1)(C-1)$$

Whereas, R = number of row, C = number of columns

$$(E) = \frac{Row\ Total \times Column\ Total}{Total\ Number}$$

3.1.3. Null Hypothesis (H0): There is no significant relationship between service functions of the construction and risk assessment

3.1.4. Alternate Hypothesis (H1): There is a significant relationship between service functions of the construction and risk assessment

3.1.5. Chi-Square with Service Functions of Organization

List of service functions of the hill station construction and the respective level of Risk factors (Questionnaire Response)

Opinion / Risk functions	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Financial Risk	74	121	75	58	32	360
Technical Risk	60	73	45	33	29	240
Socio Political Risk	39	64	65	40	32	240
Environmental Risk	103	117	72	42	26	360
Construction and Management Risk	50	63	30	20	17	180
Logistical Risk	42	89	41	16	22	210
Total	**368**	**527**	**328**	**209**	**158**	**1590**

Table 3.1 Calculation of Chi-Square Test (Questionnaire 1, Response)

Chi-Square Calculation Table

O	E	O-E	(O-E)2	(O-E)2/ E
74	83.268	-9.268	85.903	1.032
121	119.246	1.754	3.077	0.026
75	74.217	0.783	0.612	0.008
58	47.517	10.483	109.887	2.313
32	35.751	-3.751	14.071	0.394
60	55.512	4.488	20.140	0.363
73	79.497	-6.497	42.213	0.531
45	49.478	-4.478	20.055	0.405
33	31.678	1.322	1.747	0.055
29	23.834	5.166	26.687	1.120
39	55.744	-16.744	280.347	5.029
64	79.828	-15.828	250.539	3.138
65	49.684	15.316	234.565	4.721
40	31.547	8.453	71.450	2.265
32	23.933	8.067	65.070	2.719
103	83.268	19.732	389.337	4.676
117	119.246	-2.246	5.043	0.042
72	74.217	-2.217	4.917	0.066
42	47.517	-5.517	30.440	0.641
26	35.751	-9.751	95.084	2.660
50	41.634	8.366	69.987	1.681
63	59.623	3.377	11.405	0.191
30	37.109	-7.109	50.534	1.362
20	23.759	-3.759	14.127	0.595
17	17.876	-0.876	0.767	0.043
42	48.573	-6.573	43.207	0.890
89	69.560	19.440	377.913	5.433
41	43.294	-2.294	5.260	0.122
16	27.718	-11.718	137.321	4.954
22	20.855	1.145	1.311	0.063
1591	**Total**			**47.534**

Table 3.2 Chi-Square Calculation Table

Degree of freedom: (R-1) (C-1)
= (6-1) (5-1) = 20

Tabled value at 0.05 Level of significance = 31.41
Calculated value = **47.534**

4. DECISION

The calculated value of 47.534 is greater than the tabled value of 31.41. So we will reject the Null Hypothesis H0 and Accept H1. That is, there is a significant relationship between service functions of the construction risk and resource utilization. So the operative functions of the organization are relevant for this study.

4.1. HYPOTHESIS DISCUSSION

With regards to hypothesis H0, the study results explained previously in the text indicated respondent satisfaction with respondent service design elements is positively related to respondent satisfaction. This study showed this hypothesis to only be fully true. The reason for that is well-explained with chi-square. The respondents were concerned about the service features in the respondent accommodation which brought their attentiveness and made their stay more pleasant. Not all the respondents were fascinated with the design factors especially if they had issues in finding the respondents or if the service design element does not match respondent standards.

The next hypothesis (H1), indicated that respondent satisfaction with the performance of Activities, Handling Material and machineries, Usage of resources, and local knowledge of respondent were important factors in determining whether a respondent return and/or recommended the respondent to others. In this study, it is particularly important to note that respondent satisfaction with their respondent room was found to be a significant factor in determining respondent satisfaction.

4.2. FINDINGS FROM THE ANALYSIS

- Majority of the respondent believes risk identify about hill construction is a one the good concept to stay construction history.
- Constructors are successful in providing a very good and standard service and attitude for construction.
- Most of the respondents are highly agree with the overall performance of the respondent during the stay financial risks have direct affects towards cost of project.
- Most of the respondent believes their Transportation cost of material may be a cause of financial risk provides a good Courtesy of Support and friendliness environment.
- About the natural disasters are highly affect the project duration, estimated profit cost for the particular construction project.
- In the hills construction the Non-residential projects are highly affect than the residential projects. For example Highway projects, Water supply and etc.

5. CONCLUSION AND RECOMMENDATION

The study conducted at Erode and Ooty to identify study on sway of resource overrun with risk mitigation in hills construction project opinion about respondent satisfaction and also helped to suggest improving the level of satisfaction. Only certain areas require improvement like, little improvement in respondent about construction project. Co-operation from the side of respondent and respondents are also appreciated. The respondent of construction employee's respondent shows a positive response on respondent risk management satisfaction with related to various operative functions of the factor. If the respondent provides a good relationship with the respondent, then an unfair way of dissatisfaction can be easily avoided.

Thus, from the above study, recommending the risk mitigation process are should control and remove the risks from the project. So here recommend the four types of mitigation process for risk control. The risk mitigation process are risk avoidance, risk transfer, risk enhance and finally risk acceptance. It is concluded that the respondent at hills construction companies in Erode and Ooty, were satisfied in almost all the aspects.

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