ISSN: 2666-2795 Vol. 7 No. 1, 2022, Netherland

International Journal of Applied Engineering Research

Identifying Critical Factors for Stakeholder Management in Warsak Dam Second Rehabilitation Project

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Date of Submission: 04th April 2022 Revised: 05th May 2022 Accepted: 27th June 2022

Muhammad Usman Badshah, Rehman Akhtar, Mahmood Ahmad (2022). Identifying Critical Factors for Stakeholder Management in Warsak Dam Second Rehabilitation Project

Abstract - **Stakeholder may be defined as a single entity or an enterprise which is liable to be affected either constructively or adversely with the implementation of a project. Due to its pivotal role in guiding a project's future roadmap has enhanced the necessity of stakeholder's management manifold as any such mismanagement of the same could result in failure and even rolling back of a certain project. This research is aimed at investigating five, the most, critical success factors for stakeholder's management in Warsak Dam Second Rehabilitation Project. Warsak Hydroelectric Dam ,constructed across river Kabul about 30km north of the city of Peshawar, is owned and maintained by Water and Power Development Authority (WAPDA) since its installation in the year 1961. The critical factors for the study have been derived from exhausting literature review pertaining to the subject matter across the globe and thoroughly looked into; thereafter a comprehensive questionnaire was developed based on those factors. Questionnaire survey method has been adopted for collecting data from different professionals working in Warsak Dam Second Rehabilitation Project. Critical factors were ranked using relative importance index values. Top five critical success factors using RII values were deduced as "Proper coordination among stakeholders", "Identifying and understanding needs of stakeholders", "Transparency of information among stakeholders". "Promoting, healthy, frank environment and relationship among stakeholders" and "Foreseeing issues expected to arise later". Thereafter, several tests were performed using SPSS for presenting a thorough insight of the received data. The study's findings and analysis led to the formulation of suitable conclusions for effective management of stakeholders in Warsak Dam Second Rehabilitation Project which could be instrumental for successful implementation of similar nature projects in future.**

Index Terms - Questionnaire, RII, Stakeholder, Warsak Dam Second Rehabilitation Project.

INTRODUCTION

In contemporary times of economic development through industrialization, hydropower sector of any nation plays an extremely important role to feed that nation's industry with clean and green energy. Hydropower sector not only provides carbon free energy but also results in elevated quality of skilled labor by creating job

opportunities, uplifting living standards and promoting transfer of technology from developed countries to the under-developed ones. It helps impart an industrialization and corresponding social revolution which in turn puts a nation to a track of socio-economic development. This acts as an igniting spark for large scale economic activity which not only results in increased Gross Domestic Product but also helps shrinking poverty level of a country.

Pakistan has been severely hit by the menace of power outages which has not only been hampering the economic progress of the country but also causes severe inconvenience to the energy consumers in their day to day life. Rising demand and lowering supply of energy has been abstaining Pakistan's ambition to become a leading economic giant of the region. The load shedding of power has not only resulted in forced shutdown of industrial units but also hampered way for economic development. Sensing the sensitivity of the aforementioned problem, stern efforts have been put in place for harnessing the robust hydro resources of Pakistan. The same is evident from the WAPDA's vision 2030 which is aimed at securing 10,000MW of green hydro-electricity for the national grid. During the course of construction of these hydro projects huge amounts of capital is expected to be injected into the national exchequer from different donors/investing agencies which will help enhance the living standards of the people far before commissioning of these mega projects.

Stakeholders may be described as those people or organizations that are probably being affected (either negatively or positively) or in other words those people or groups whom can influence the output of a project. Stakeholders may be considered as foundation of any endeavor and without comprehending their demands and expectations a project can never achieve its desired objectives. The need to address the anticipated requirements of stakeholders is on the rise which includes but not limited to their identification, classification then interlinking them. Previously lack of awareness was there regarding stakeholders management but different problems floated to the surface in hydropower construction industry which compelled professionals to emphasize on the importance of stakeholders management. For a project accomplishing its pre-set goals to the maximum level, it is imperative to understand that every stakeholder has got some ambition which needs to be catered for and hence managing stakeholders is instrumental in successful execution of a development initiative. Management of stakeholders is an intricate process and it is not just one time activity but at every stage of project management it should be adopted with full zeal and zest.

Now, this research will be focusing on identifying critical success factors of stakeholder management concerning Warsak Dam Second Rehabilitation Project. Warsak Hydroelectric Dam is constructed across river Kabul about 30km north of the city of Peshawar. The project is owned and maintained by WAPDA since its installation in the year 1961. The dam has an integrated power station which has been contributing 243MW of clean and green energy to the national grid a part from being a source of water to different canals that irrigates the Peshawar and Nowshera valleys respectively. The dam acts as a lifeline ensuring food security and socio economic development of these districts. Over the years, several problems have arisen in the dam and its allied power station which included but not limited to structural deformation due to AAR (alkali aggregate reaction) and associated misalignment of turbine shaft, overhead cranes, penstock etc. These problems prompted WAPDA to carry out the first rehabilitation of the dam and power station that lasted from 1996-2006. Since, the dam and power house were constructed in 1960 hence most of the E&M equipment have lately become obsolete which resulted in Warsak Power Station lagging behind in achieving its original power generation capacity of 243MW. The power plant currently generates 190MW of energy. So, the Second Rehabilitation of the Power Station was initiated by WAPDA in the year 2015 aiming at restoring the original designed power generation capacity of the plant viz 243MW.

The Warsak Dam Second Rehabilitation Project was supposed to be concluded in the 2022 as per project PC-1. But as of 2021 the project was far from over. The civil works contract has been awarded in April 2021 while the E&M contract has been finalized in November 2021. This research is aimed at identifying critical factors that may have resulted in the everlasting delays and provide guidelines for rehabilitation projects so that such unwarranted delays do not occur in future similar nature projects.

LITERATURE REVIEW

Stakeholders are typically defined as individuals, groups, or organizations that can be positively or negatively affected by a project, or those who can influence the outcome of a project. A stakeholder is someone or a group that has the power to affect the goals of a project. Therefore, stakeholders refer to all pertinent individuals, organizations, or entities that hold significance [1]. Generally, stakeholders are defined as persons, groups, or institutions that may be positively or negatively affected by a project, or those who can influence the ultimate result of a project. Stakeholders are individuals or groups who may have a vested interest in and can contribute to the proposed project, whether directly or indirectly [2]. Stakeholders can be more comprehensively defined as those who will experience a direct benefit or loss as a result of the project [3].Stakeholders are commonly divided into two main groups: internal stakeholders and external stakeholders. The former comprises individuals who are directly engaged in the project's execution or have invested in it, while the latter refers to those who are notably impacted by the project. Stakeholders are those participants who receive a direct benefit or loss from a project or who are either directly benefitted or adversely affected by a project [4].

I. Stakeholder's Management

Growing amount of studies has revealed that researchers are highly convinced with the idea of stakeholder management in construction industry [5, 6]. To address issues, project teams need to understand the basics of managing stakeholders [7]. However, due to some stakeholder groups' increasing tendency to influence project planning and construction, traditional stakeholder management methods have become inadequate, leading to conflicts and disputes [8]. Therefore, it is crucial to explore additional management tools that can help minimize real estate issues and disputes arising from conflicting interests of external stakeholders [9]. To build an effective stakeholder management methodology, enterprises need to understand the needs and benefits of external parties in relation to project objectives. Negotiation is a critical and essential method for resolving disputes, and it involves a joint decision-making process between interdependent parties with different priorities and partially conflicting interests [10]. The negotiation process usually ends with a creative research activity resulting in a settlement agreement [11].

II. Critical Success Factors For Stakeholders Management

The successful execution of a project depends on several critical factors. Various scholars have identified factors that are essential for the success of a construction project, which goes through multiple phases until completion. These success factors are determined based on past experiences, articles discussing critical success factors for stakeholder management, and books authored by knowledgeable scholars. Critical success factors are considered as activities and practices that should be kept in mind to ensure effective management of stakeholders. This technique has been utilized by numerous researchers as a means to enhance the effectiveness of management processes [12]. Through an in-depth review of literature, it has been discovered that several crucial factors for success must be acknowledged in the implementation of stakeholder management and hence identified two aspects of improvement that are necessary for managing stakeholders are effective communication with stakeholders and the establishment of shared goals, objectives, and project priorities [13]. The success of a construction project in meeting the needs of its stakeholders and achieving long-term performance is influenced by the decisions and level of attention given to stakeholder communication by decision-makers [14]. The key challenge in project stakeholder management is effectively managing the relationship between the project and its stakeholders [15]. Critical factors are the activities which if properly managed can lead to a successful project. Success of a project is defined in different scenarios but the most attractive one is that the project which is completed within three triple constraints i.e quality, scope and time. These are the factors which accompany a project to move smoothly till completion. Critical success factors can assist project managers with helpful tools to analyze a project. Project managers if implement these factors can minimize lots of disputes which can arise due to ignorance of these factors. In recent times, many scholars have shown a heightened interest in environmental expectations for sustainability reasons [16]. Project managers must handle stakeholders with corporate social responsibilities that include economic, legal, environmental, and ethical considerations [17]. Project managers must have a clear understanding of the various reactions and behaviors of stakeholders [18]. To achieve their objectives, organizations typically utilize the tool of estimating critical success factors to measure and compare their performance. Developing critical success factors is a crucial part as it could identify the reason of failure as well as improving the system. The notion of critical success factors present a better way to enlist those reasons or factors which if ensured can lead to a successful project. The success of a construction project is influenced by various factors that are interrelated, and some of them are known as critical success factors (CSF) in literature. Recognizing these success factors can aid in developing effective strategies to reduce conflicts in construction and enhance project performance. The critical success factors may be categorized into seven primary categories, which include project management, procurement, client, design team, contractor, project manager, and business/work environment factors [19].

RESEARCH METHODOLOGY

Questionnaire survey has been carried out for acquisition of data. Critical factors have been extracted from detailed literature review and response of professionals has been received in hard form. Structured questionnaire was developed by taking into account the different critical factors. Likerts scale rating was employed for rating response of respondents. 1 to 5 scale has been used in which 5 represented strongly agree and 1 represented strongly disagree.

Special emphasis was given to questionnaires which were initially developed. Refinement was made several times in the questionnaires in order to optimize the factors and ambiguities were cleared to the maximum. Questionnaires were then finalized for acquisition of data from respondents. Respondents were the professionals directly involved in Warsak Dam Second Rehabilitation Project having vast experience in hydropower sector of Pakistan.

I. Data Collection

Data has been collected in hard form the target respondents in person. Questionnaires have been simplified and understandable in order to get reliable responses from the respondents. The data once received have been thoroughly vetted and invalid responses were scored out. Only the valid responses were then considered and uploaded

on an MS Excel sheet as further analysis were carried out on the subject excel sheets and thereafter the SPSS software. The respondents varied from Civil, Electrical and Mechanical engineers to technologists of the same fields as well as accounting and HR professionals working in Warsak Dam Second Rehabilitation project.

II. Sample Size

According to several researchers and economists, a sample size of at least 30 is considered to be the minimum for statistical analysis as sample size smaller than 30 would make it difficult to obtain a statistically significant result [20]. The reason for this is that a sample size of 30 often leads to a sampling distribution of the mean that closely resembles a normal distribution. Therefore, for this research, a minimum of 30 respondents were considered. However, the choice of sample size depends on the level of confidence and margin of error desired for the data to accurately represent the population characteristics.

Total 82 respondents were served the questionnaire for which 77 responses were received. Out of 77 responses 70 were found in proper order and hence considered for data analysis. The percentage of valid responses collected is found to be 91%.

A structured questionnaire was developed after detailed literature review based on 20 critical factors. Literature review was thoroughly carried out and questions were properly shaped to provide convenience to the respondents. 1-5 scale was selected in which 1 represented strongly disagree and 5 represented strongly agree. The collection of responses took almost three months. The sources of distribution of questionnaires were normal dispatching procedure as well serving questionnaires in person and received back through the same channels. After collection of the requisite data, analysis was carried out. 70No responses were received in proper order out of 82No served in total. The respondents consisted of professionals from three pillars of a project i-e Client, Consultant and Contractor involved in Warsak Dam Second Rehabilitation Project. Critical success factors which have been identified & extracted from detailed literature review are as under:

TABLE I: CRITICAL SUCCESS FACTORS

S.no.	Description
1	Transparency of information among all stakeholders.
2	Identifying & understanding needs of stakeholders.
3	Promoting healthy and frank environment and relationship among stakeholders.
4	Declaring occasion and venue of stakeholders meeting.
5	Proper Coordination among stakeholders.
6	Foreseeing issues expected to arise later.
7	Recognizing expectations of stakeholders.
8	Defining shared/combined objectives of a project.
9	Identifying a committee to be established in case of any dispute/conflict.
10	Identification of communication channel to be adopted by each stakeholder.
11	Devising strategy to manage stakeholder's responsibilities.
12	Obtaining confidence of stake holders while giving any approval of change order.
13	Involvement of relevant stakeholders in planning phase of project.
14	Developing a framework which describes the relationships among stakeholders during execution phase of project.
15	Forecasting the consequence of mismanagement of stakeholders.
16	Ensuring Bonds/Bank guarantees from stakeholders which can assure that no violation of the declared rules will be made.
17	Managing proper negotiations among stakeholders in case of any disagreement.
18	Assessment of previous endeavors made by stakeholders.
19	Satisfaction of stakeholders at the activities of project.
20	Assessment of social and legal responsibilities of stakeholders.

III. Data Analysis

After the questionnaires were retrieved, they were prepared for the data analysis after being compiled and sorted. This research study utilized MS Excel and SPSS as the primary tool for compiling and analyzing data. All the questionnaire based data was entered into an Excel spreadsheet and compiled in a manner conducive to further analysis.

The Relative Importance Index (RII) was used fordeducing significance of attributes under consideration. "The RII is commonly used method in construction to obtain priority ranking of attributes, and it is particularly useful where a structured questionnaire is used to solicit measurements that are subjective in nature" (Holt, 1997). The RII is computed as per equation (1):

$$RII = \sum P_i/N \text{x} U. \quad (1)$$

where P_i = Value of each factor received from each respondent on scale 1-5

N = Number of Respondents (70 in this case)

U = Highest value on likert's scale which in this case is 5 (strongly agree)

RESULTS

The data received from respondents were first entered into MS excel sheet and then arranged and set for analysis in SPSS. The rate of validity of responses is shown in the form of pie chart as under:

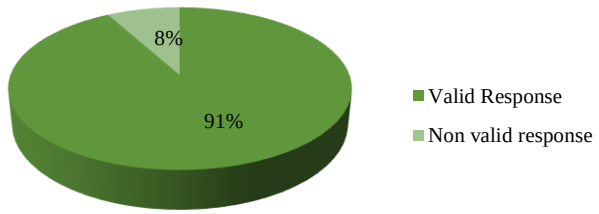

FIGURE 1: VALIDITY OF RESPONSES

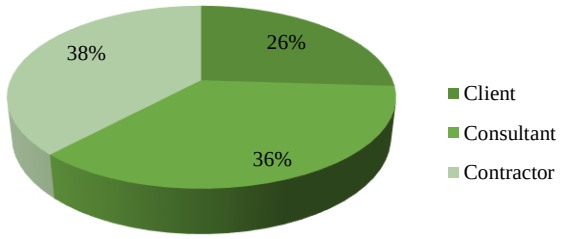

FIGURE 2: RESPONDENTS CATEGORY

I. Reliability Statistics

TABLE 2: RELIABILITY STATISTICS

Cronbach's Alpha	No. of Items
0.959	20

The Cronbach's alpha for the data under analysis falls in the range of 0.70-0.90 hence may be termed as excellently reliable according to Hilton et al. 2004.

II. Relative Importance Index (RII)

TABLE 3: RELATIVE INDICES OF CSFs FOR STAKEHOLDER MANAGEMENT IN WARSAK DAM SECOND REHABILITATION PROJECT

S.No	Description	RII
1	Proper Coordination among stakeholders.	0.844
2	Identifying & understanding needs of stakeholders.	0.841
3	Transparency of information among all stakeholders.	0.833
4	Promoting healthy and frank environment and relationship among stakeholders.	0.824
5	Foreseeing issues expected to arise later.	0.799
6	Obtaining confidence of stake holders while giving any approval of change order.	0.798
7	Involvementofrelevantstakeholdersinplanningphaseofproject.	0.796
8	Assessment of previous endeavors made by stakeholders	0.791
9	Satisfaction of stakeholders at the activities of project.	0.789
10	Forecasting the consequence of mismanagement of stakeholders	0.781
11	Recognizing expectations of stakeholders.	0.780
12	Identification of communicationchanneltobe adoptedbyeachstakeholder.	0.776
13	Devising strategy to manage stakeholder's responsibilities.	0.773
14	Assessment of social and legal responsibilities of stakeholders.	0.771
15	Defining shared/combined objectives of a project.	0.760
16	Managing proper negotiations among stakeholders in case of any disagreement.	0.756
17	Identifying a committee to be established in case of any dispute/conflict.	0.742
18	Declaring occasion and venue of stakeholders meeting.	0.733
19	Ensuring Bonds/Bank guarantees from stakeholders which can assure that no violation of the declared rules will be made.	0.731
20	Developing a framework which describes the relationships among stakeholders during execution phase of project.	0.713

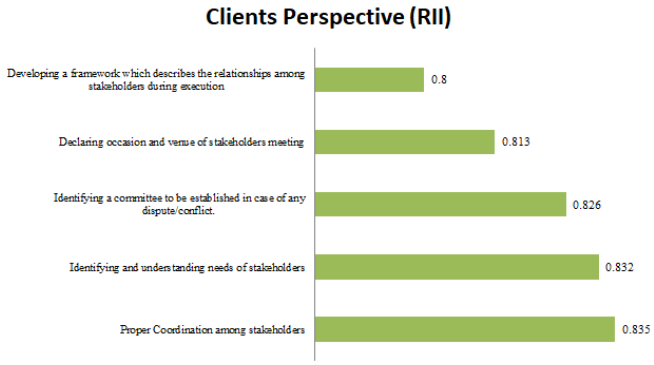

FIGURE 3: RII CLIENT'S PERSPECTIVE

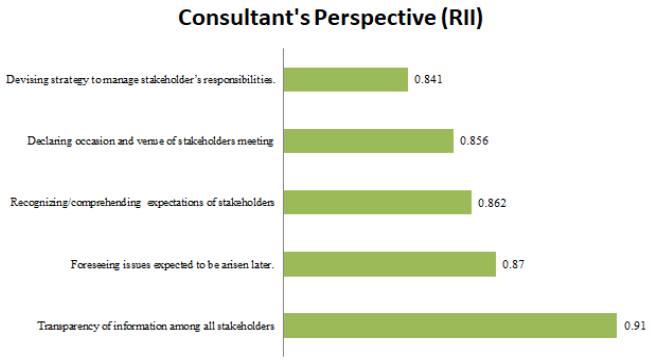

FIGURE 4: RII CONSULTANT'S PERSPECTIVE

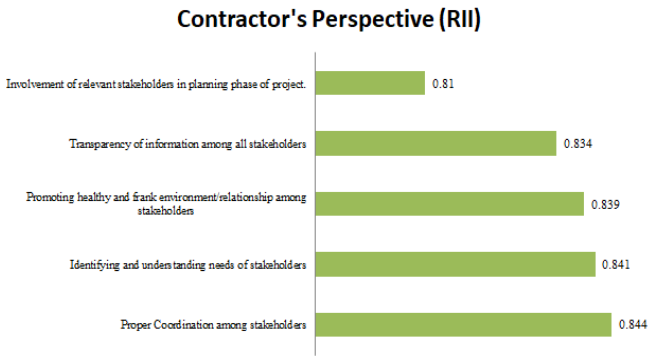

FIGURE 5: RII CONTRACTOR'S PERSPECTIVE

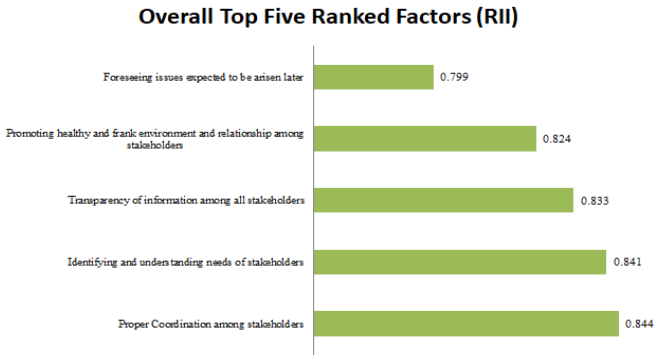

FIGURE 6: RII OVERALL TOP FIVE RANKED FACTORS

"Proper coordination among stakeholders" got the highest relative index or weight age and hence marked as top ranked factor. 2nd ranked factor is "Identifying and understanding needs of stakeholders" and 3rd Factor is "Transparency of information among stakeholder". The above list is framed in descending order of relative indices.

III. Comparison of Means

TABLE 4: COMPARISON OF MEANS

S. No.	Description	Mean
1	Proper Coordination among stakeholders.	4.2286
2	Identifying & understanding needs of stakeholders.	4.1571
3	Transparency of information among all stakeholders.	4.1429
4	Promoting healthy and frank environment and relationship among stakeholders.	4.1286
5	Foreseeing issues expected to arise later.	4.1143
6	Obtaining confidence of stake holders while giving any approval of change order.	4.0571
7	Involvementofrelevantstakeholdersinplanningphaseofproject.	4.0714
8	Assessment of previous endeavors made by stakeholders	4.0857
9	Satisfaction of stakeholders at the activities of project.	4.0286
10	Forecasting the consequence of mismanagement of stakeholders	4.0143
11	Recognizing expectations of stakeholders.	3.9571
12	Identification of communication channel to be adopted by each stakeholder.	3.9714
13	Devising strategy to manage stakeholder's responsibilities.	3.9714
14	Assessment of social and legal responsibilities of stakeholders.	3.9857
15	Defining shared/combined objectives of a project.	3.9429
16	Managing proper negotiations among stakeholders in case of any disagreement.	3.9429
17	Identifying a committee to be established in case of any dispute/conflict.	3.7143
18	Declaring occasion and venue of stakeholders meeting.	3.6714
19	Ensuring Bonds/Bank guarantees from stakeholders which can assure that no violation of the declared rules will be made.	3.6857
20	Developing a framework which describes the relationships among stakeholders during execution phase of project.	3.5714

IV. One Sample T-Test

This test has been carried out to check significance of the data at 95% confidence interval. Lower and upper bound of

each factor's mean has been computed. 2-tailed tests have been carried out.

TABLE 5: ONE SAMPLE T-TEST

		Test Value=0					
S.No	Factors	T	Df	Sig. (2-tailed)		95% Confidence Interval of the Difference	
						Lower	Upper
1.	Proper Coordination among stakeholders.	38.475	69	.000	4.22861	4.0093	4.4478
2.	Identifying & understanding needs of stakeholders.	42.939	69	.000	4.15713	3.9640	4.3503
3.	Transparency of information among all stakeholders.	40.005	69	.000	4.14292	3.9091	4.3195
4.	Promoting healthy and frank environment and relationship among stakeholders.	38.975	69	.000	4.12861	3.9308	4.3549
5.	Foreseeing issues expected to arise later.	40.642	69	.000	4.11432	3.9259	4.3312
6.	Obtaining confidence of stake holders while giving any approval of change order.	37.097	69	.000	4.05714	3.8390	4.2753
7.	Involvement of relevant stake holders in planning phase of project.	42.349	69	.000	4.07143	3.8796	4.2632
8.	Assessment of previous endeavors made by stakeholders	38.826	69	.000	4.08571	3.8758	4.2956
9.	Satisfaction of stakeholders at the activities of project.	34.478	69	.000	4.02857	3.7955	4.2617
10.	Forecasting the consequence of mismanagement of stakeholders	36.957	69	.000	4.01429	3.7976	4.2310
11.	Recognizing expectations of stakeholders.	31.367	69	.000	3.95714	3.7055	4.2088
12.	Identification of communication channel to be adopted by each stakeholder.	34.516	69	.000	3.97143	3.7419	4.2010
13.	Devising strategy to manage stakeholder's responsibilities.	34.516	69	.000	3.97143	3.7419	4.2010
14.	Assessment of social and legal responsibilities of stakeholders.	33.845	69	.000	3.98571	3.7508	4.2206
15.	Defining shared/combined objectives of a project.	36.693	69	.000	3.94286	3.7285	4.1572
16.	Managing proper negotiations among stakeholders in case of any disagreement.	33.286	69	.000	3.94286	3.7065	4.1792
17.	Identifying a committee to be established in case of any dispute/conflict.	26.584	69	.000	3.71429	3.4356	3.9930
18.	Declaring occasion and venue of stakeholders meeting.	26.980	69	.000	3.67143	3.4000	3.9429
19.	Ensuring Bonds/Bank guarantees from stakeholders which can assure that no violation of the declared rules will be made.	28.804	69	.000	3.68571	3.4304	3.9410
20.	Developing a framework which describes the relationships among stakeholders during execution phase of project.	38.475	69	.000	4.2286	4.0093	4.4478

Difference of the upper and lower bound of each factor has been worked out at 95% confidence interval.

V. Descriptive Statistics

This test carried out in SPSS reflected the statistics of received data from different respondents. As shown in Table 6, it reveals the number of respondents, minimum and maximum value of responses for a, mean and standard deviation of a particular factor.

This is merely an indication of statistics of received data. Standard deviation has also been worked out to reveal that how much deviation a particular factor has from the mean value.

TABLE 6: DESCRIPTIVE STATISTICS

S.No.	Factors	N	Min.	Max.	Mean	Std Dev.
1.	Proper Coordination among stakeholders.	70	1.00	5.00	4.2286	.91954
2.	Identifying & understanding needs of stakeholders.	70	1.00	5.00	4.1571	.81000
3.	Transparency of information among all stakeholders.	70	1.00	5.00	4.1429	.86045
4.	Promoting healthy and frank environment and relationship among stakeholders.	70	1.00	5.00	4.1286	.88932
5.	Foreseeing issues expected to arise later.	70	1.00	5.00	4.1143	.84992
6.	Obtaining confidence of stake holders while giving any approval of change order.	70	1.00	5.00	4.0571	.91502
7.	Involvement of relevant stake holders in planning phase of project.	70	1.00	5.00	4.0714	.80436
8.	Assessment of previous endeavors made by stakeholders	70	1.00	5.00	4.0857	.88043
9.	Satisfaction of stakeholders at the activities of project.	70	1.00	5.00	4.0286	.97760
10.	Forecasting the consequence of mismanagement of stakeholders	70	1.00	5.00	4.0143	.90878
11.	Recognizing expectations of stakeholders.	70	1.00	5.00	3.9571	1.05550
12.	Identification of communication channel to be adopted by each stakeholder.	70	1.00	5.00	3.9714	.96266
13.	Devising strategy to manage stakeholder's responsibilities.	70	1.00	5.00	3.9714	.96266
14.	Assessment of social and legal responsibilities of stakeholders.	70	1.00	5.00	3.9857	.98530
15.	Defining shared/combined objectives of a project.	70	1.00	5.00	3.9429	.89904
16.	Managing proper negotiations among stakeholders in case of any disagreement.	70	1.00	5.00	3.9429	.99106
17.	Identifying a committee to be established in case of any dispute/conflict.	70	1.00	5.00	3.7143	1.16896
18.	Declaring occasion and venue of stakeholders meeting.	70	1.00	5.00	3.6714	1.13854
19.	Ensuring Bonds/Bank guarantees from stakeholders which can assure that no violation of the declared rules will be made.	70	1.00	5.00	3.6857	1.07059
20.	Developing a framework which describes the relationships among stakeholders during execution phase of project.	70	1.00	5.00	3.5714	1.14931

Descriptive statistics depicts the importance of a factor from its mean value. The factor which got highest value of mean usually implies the most significant factor which in this case is "Proper coordination among stakeholders" which has got value of 4.2286.2nd highest mean holder is "Identifying and understanding needs of stakeholders". Maximum and minimum value of likert's scale can be checked in above table.

VI. Pearson Co-Relation Matrix

TABLE 7: PEARSON CO-RELATION MATRIX

CSFs	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13	F14	F15	F16	F17	F18	F19	F20
F1	1	.476**	.479**	.704**	.370**	.708**	.565**	.638**	.605**	.534**	.578**	.613**	.597**	.564**	.612**	.396**	.466**	.363**	.472**	.355**
F2	.476**	1	.535**	.572**	.812**	.594**	.628**	.672**	.598**	.548**	.517**	.433**	.582**	.493**	.590**	.499**	.569**	.387**	.576**	.509**
F3	.479**	.535**	1	.452**	.594**	.525**	.532**	.484**	.565**	.665**	.420**	.634**	.424**	.395**	.571**	.569**	.580**	.276*	.449**	.417**
F4	.704**	.572**	.452**	1	.531**	.595**	.715**	.873**	.662**	.464**	.532**	.513**	.750**	.664**	.754**	.585**	.458**	.448**	.535**	.486**
F5	.370**	.812**	.594**	.531**	1	.549**	.601**	.585**	.571**	.636**	.491**	.536**	.536**	.487**	.636**	.663**	.548**	.314**	.523**	.487**
F6	.708**	.594**	.525**	.595**	.549**	1	.565**	.587**	.614**	.592**	.513**	.594**	.611**	.515**	.638**	.419**	.463**	.394**	.566**	.465**
F7	.565**	.628**	.532**	.715**	.601**	.565**	1	.789**	.624**	.514**	.533**	.527**	.583**	.678**	.667**	.605**	.592**	.501**	.700**	.582**
F8	.638**	.672**	.484**	.873**	.585**	.587**	.789**	1	.721**	.506**	.612**	.499**	.704**	.686**	.739**	.587**	.503**	.520**	.629**	.509**
F9	.605**	.598**	.565**	.662**	.571**	.614**	.624**	.721**	1	.505**	.465**	.632**	.648**	.753**	.744**	.525**	.515**	.282*	.632**	.437**
F10	.534**	.548**	.665**	.464**	.636**	.592**	.514**	.506**	.505**	1	.560**	.564**	.497**	.324**	.533**	.468**	.604**	.355**	.452**	.603**
F11	.578**	.517**	.420**	.532**	.491**	.513**	.533**	.612**	.465**	.560**	1	.584**	.541**	.473**	.532**	.496**	.695**	.676**	.642**	.713**
F12	.613**	.433**	.634**	.513**	.536**	.594**	.527**	.499**	.632**	.564**	.584**	1	.546**	.504**	.551**	.530**	.572**	.282*	.554**	.526**
F13	.597**	.582**	.424**	.750**	.536**	.611**	.583**	.704**	.648**	.497**	.541**	.546**	1	.641**	.768**	.545**	.508**	.335**	.497**	.421**
F14	.564**	.493**	.395**	.664**	.487**	.515**	.678**	.686**	.753**	.324**	.473**	.504**	.641**	1	.703**	.637**	.462**	.357**	.586**	.327**
F15	.612**	.590**	.571**	.754**	.636**	.638**	.667**	.739**	.744**	.533**	.532**	.551**	.768**	.703**	1	.679**	.563**	.335**	.583**	.453**
F16	.396**	.499**	.569**	.585**	.663**	.419**	.605**	.587**	.525**	.468**	.496**	.530**	.545**	.637**	.679**	1	.574**	.458**	.543**	.424**
F17	.466**	.569**	.580**	.458**	.548**	.463**	.592**	.503**	.515**	.604**	.695**	.572**	.508**	.462**	.563**	.574**	1	.538**	.668**	.771**
F18	.363**	.387**	.276*	.448**	.314**	.394**	.501**	.520**	.282*	.355**	.676**	.282*	.335**	.357**	.335**	.458**	.538**	1	.616**	.666**
F19	.472**	.576**	.449**	.535**	.523**	.566**	.700**	.629**	.632**	.452**	.642**	.554**	.497**	.586**	.583**	.543**	.668**	.616**	1	.678**
F20	.355**	.509**	.417**	.486**	.487**	.465**	.582**	.509**	.437**	.603**	.713**	.526**	.421**	.327**	.453**	.424**	.771**	.666**	.678**	1

*Correlation is significant at 0.05 level (2-tailed)
**Correlation is significant at 0.01 level (2-tailed)

In Pearson Co-relation Matrix abbreviations were used for factors F1-F20 as description was unable to be incorporated in matrix. It is evident from above performed test that no considerable correlation was found among any two factors. Value of Pearson correlation didn't exceed 0.771 in any case which signifies weak correlation. In same factors negative value was observed which pointed negative and weak correlation. All the factors were open and no categorization was made. The above performed correlation matrix also revealed that no repetition was observed between any two factors. Sometimes, two factors revealed same meaning for respondents hence correlation in that case between those two factors was usually strong.

TABLE 8: ABBREVIATIONS ALONG WITH DESCRIPTION OF EACH FACTORS

S.No.	Description
F1	Transparency of information among all stakeholders.
F2	Identifying & understanding needs of stakeholders.
F3	Promoting healthy and frank environment and relationship among stakeholders.
F4	Declaring occasion and venue of stakeholders meeting.
F5	Proper Coordination among stakeholders.
F6	Foreseeing issues expected to arise later.
F7	Recognizing expectations of stakeholders.
F8	Defining shared/combined objectives of a project.
F9	Identifying a committee to be established in case of any dispute/conflict.
F10	Identification of communication channel to be adopted by each stakeholder.
F11	Devising strategy to manage stakeholder's responsibilities.
F12	Obtaining confidence of stake holders while giving any approval of change order.
F13	Involvement of relevant stakeholders in planning phase of project.
F14	Developing a framework which describes the relationships among stakeholders during execution phase of project.
F15	Forecasting the consequence of mismanagement of stakeholders.
F16	Ensuring Bonds/Bank guarantees from stakeholders which can assure that no violation of the declared rules will be made.
F17	Managing proper negotiations among stakeholders in case of any disagreement.
F18	Assessment of previous endeavors made by stakeholders.
F19	Satisfaction of stakeholders at the activities of project.
F20	Assessment of social and legal responsibilities of stakeholders.

CONCLUSIONS

I. Proper Coordination among Stakeholders

This factor has the highest relative index value of 0.844 and a mean of 4.228, making it the top-ranked factor in the list of priority factors. It depicts that professionals working in Warsak Dam Second Rehabilitation Project highly emphasize on importance of coordination among stakeholders. This factor is extremely vital for successful stakeholder's management. Many issues arise due to non-coordination among stakeholders. Whether there is a technical, administrativeor social issue prevalent to a project, all stakeholders must be taken on board to resolve that issue through continuous and well-coordinated liaison. Coordination at each phase of a project in construction industry is a key to success. Team work is a key to understand the essence of coordination between different stakeholders working together for achieving a common objective.Coordination among stakeholders should be ensured right from the scratch of any project in construction industry. Stakeholders if move parallel can simplify lots of complicated issues. Since a project can only achieve its intended goals with all the stakeholders putting their combined efforts into unified objective i-e project charter hence formal meet-ups should be arranged and proceedings of those meetings should be well recorded. This approach will give rise to unified group tied together for achievement of common goal. Disagreements and conflict among stakeholders should be addressed through meaningful dialogue so that harmony among different parties is maintained. Channel of communication should be open round the clock so as to ensure transparency of information among different stakeholders.

II. Identifying and Understanding Needs of Stakeholders

The factor is essential and critical for achieving the goals outlined in stakeholder management. It has a relative index value of 0.841 and is ranked as the second-highest priority attribute. Without understanding the needs/requirements of stakeholders no project can be termed as successfully. Every stakeholder has its own needs and expectations and that should be cared in the best possible way. Working style of each stakeholder and its needs/requirements may be unique but to identify and understand those needs properly is the first step towards success. Client/Employer is a major stakeholder and its position in a construction project should be understood and honored and vice versa. Issue of misperception of needs can lead to threatening circumstances. Employer usually places a project in market to achieve/complete it in the best possible way and never lets any agency to violate the pre-set rules. Needs of every stakeholder if managed properly can pave the way for a successful project.In nutshell, each stakeholder must comprehend and honor others needs and expectations within the parameters of project charter.

III. Transparency of Information Among Stakeholders

The factor with the third highest RII value has been ranked in third place. Communication among stakeholders and its transparency is a significant factor for successful stakeholder's management. There should be no ambiguity on part of any stakeholder. Ambiguous communication or information creates severe issues in construction industry. Verbal communication should be avoided because no agency takes the responsibility of verbal transmission of communication. The correspondence made should be well sorted and recorded. Proper files should be maintained at offices of every stakeholder in order to avoid inconvenience in later part of a project. Vague wordings usually can be perceived in different ways and hence should be avoided. Written/digital and unambiguous channel of communication should be adopted, many a time's decisions are made and accordingly verbal directives are issued by the client. Such instructions passed verbally on site, if not covered in scope of work, often results in serious complications at later stage. In such cases although directives are given in best interest of project yet it lacks written proof to substantiate its validity and hence gives rise to unpleasant scenario developed between different stakeholders. It has been observed that on many occasions in heat of moment employer hastily instructs contractor to carry out a particular work not covered in original scope of contract but at the time of liability clearance the payment for that specific piece of work is denied by quoting different clauses wherein written concurrence from client or consultant was required. This factor gives rise to high level of mistrust which has a far reaching impact on harmony among different stakeholder of a project. Concealment of information should be avoided among stakeholders. All the communications being made should be crystal clear in its meaning supported by written/digital proof duly authorizing its authenticity.

IV. Promoting Healthy & Frank Environment and Relationship among Stakeholders

This factor is ranked as 4th according to computed relative index value of 0.824. If execution of work is carried out in a frank environment and relationships are honored then success of a project is ensured. Many a time'sdifferent project activities are jeopardized due to leg pulling and hostilerelationship among stakeholders due to mistrust. Every stakeholder shouldwork within its prescribed domain and efforts should be made to avoid different stakeholder from encroaching each other's domain. If every stakeholder takes care of the responsibilities of other stakeholders and a team work spirit in a decent environment is developed then lots of complications could be avoided. Healthy working environment encourages better service delivery on part of human resource of a project. Understanding the nature of relationships among stakeholders is of prime importance. Each stakeholder should realize its relationship with other stakeholders. Nature of work of every stakeholder should be well specified. Deviation from one's own domaincould

create severe problems. As result of ignoring this factor, many times confrontations occur among representatives of client, consultant and contractor due to which activities of project are ultimately suffered. Sharing of harsh words in meetings should be avoided and frank and friendly working environment to be encouraged.

V. Foreseeing Issues That Can Arise Later

Stakeholders should have broad vision to foresee issues which can create problems at later stage of a project. Some issues are of such nature that if overlooked once can't be redressed. Stakeholders should be proactive and vigilant in their approach. This foreseeing power could be developed from enlightening through past experiences and technical knowledge. Lessons learned from different projects undertaken in past can be kept mind forehand before proceeding ahead any new endeavor in future.

CONFLICT OF INTEREST

The authors state no conflict of interest

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