

Integration of Risk Management in Development of Restaurant in Coastal Area 'Do Darya' Karachi

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ABSTRACT

In Karachi, the restaurant development sector is boosting, predominately in the coastal area 'Do Darya' Karachi. Coastal Areas are an opportunity to grasp for development all over the world but simultaneously associated with various risks. In this research, the author integrated risk management in the development sector (design, construction, and project management) to identify, analyze, and respond to associated risks. Firstly, to broaden the perspective of development industries the importance of formulation of risk methodologies before investing. Secondly, to benefits developers and investors and to build an effective model for sustainable development in Coastal Area 'Do Darya' Karachi. Further to understand risk factors in the relationship of involvement of project manager in the restaurant development sector in the parameter of design and construction.

Keywords: *Risk Management, Restaurant Development, Coast Areas, Design, Construction, and Project Management*

1. INTRODUCTION

The coastal area is an interface between land and sea. It keeps on changing dynamically interms of environment, social-economic developmentssuch as recreational activities to promote tourism. The 440000 km long coastal area is among the most important and dynamic natural environments where not only several humans, animal, vegetal and geomorphic interaction but it's invaluable and ecological richness makes it desirable zone for the social, industrial and recreational infrastructure development**Error! Reference source not found..**

In the immediate context of our city Karachi, water is the element of nature which is

cherished by most of the people and deserves analysis. Karachi is a city that attracts people from all over the country. Because of its most prominent feature city's interface, the sea. It is due to this sea that back in 1729 the merchants and traders came to Karachi **Error! Reference source not found..** Karachi coastal line stretches over 60 km, having a lot of potential for generating the economy for the country. Karachi has the advantage of having a coastal line making it prestigious to be the tradecenter and focus of the economy as well as national and international travel. However, lookingat the vast shoreline and with emerging new water-related recreational activities one findsan immense recreational potential left to be exploited and which could be

enhanced because Karachi is a city that lacks within itself the avenues of relaxation and entertainment. The factor that provides the real entertainment to the people of Karachi all-year-round basis is the sea. The majority of the population of Karachi looks up to the shoreline as their source of recreation.

The recent potential recreational development of Food Street emerged in the coastal area of Karachi popularly known as Do Darya. The 1.5 kilometers long Do Darya food street has attracted various locals and tourists both nationally and internationally because of its fine dining restaurants and serene views and atmosphere. The drug and other crimes around 10 years back devalued the property and people who invested in owning the plot dreaded their decision. **Error! Reference source not found.** Now, this new potential economical hub in coastal area 'Do Darya' has approx. 37 restaurants, but due to customer influx this area demands more potential food ventures. Simultaneously more developers and investors are grabbing development opportunities at Defence Phase VIII due to 'Do Darya Food Street'.

On the one hand, Coastal area development is an opportunity to grasp in terms of social-economic factors, but on other hand, the impact of mother nature on coastal areas pose problems which in case of extreme flooding and beach erosion caused the land loss, damage to infrastructure and natural habitats, ecological imbalance, health problems in the population and economic instability. **Error! Reference source not found.**

Development industries revolve around design and construction. Risk is raised from several different sources as the development industry is constantly unique **Error! Reference source not found.** Development projects are highly complex and dynamic and require multiple feedback processes **Error! Reference source not found.** In this domain various types of participants and organizations are involved actively, with their own

set of objectives, task, and skills; these various stakeholders' interests also result in affecting project execution and completion.

In this research, the author will firstly address an overview of risk assessment methodologies, to initiate future restaurant development potential at Do Darya coastal area in Karachi. The literature will reflect and focus on analysis and evaluation of risks of development industries (design, construction, and project management) in coastal areas; comprises of research articles, news articles, laws and regulations, coastal areas construction manuals, research projects, and conferences.

1.1. Research Objectives

The main purpose of the research is to implement a risk management process that includes identification and analyzing risks, and improvement of development industry parameters in coastal areas. The objectives of the research can be summarized as follows:

- 1) To identify the risks in the parameter of development industries (design, construction and project management)
- 2) To get a real output of successful restaurant development in coastal area 'Do Darya' Karachi.

1.2. Research Problems

Although project management is integrated with development industries. But still, investors mostly overlook the detailed risk factors in the domain of project management. Especially in the case of a coastal area, rather moving forward to proactive strategies of development, it mostly looks into a reactive solution. Recently, due to the closing of some restaurants at Do Darya, it severely affected the area environmentally, socially, and economically. As mentioned in one of the articles in Dawn by the restaurant owner who invested Rs.250 million which

won't be able to earn when they vacate the premises **Error! Reference source not found.**

This research evolves around independent variables restaurant development (Design, Construction and Project Management) risks and dependent variable Coastal Area (Do Darya, Karachi)

1.3. Risk and Risk Management

According to **Error! Reference source not found.** risk is could be well-defined as the contact to the possibility of monetary loss or benefit, physical danger, or injury or delay as a magnitude of the uncertainty associated with perusing a particular course of action.

A typical approach to risk management involves four steps

- 1) Risk identification;
- 2) Risk assessment;
- 3) Risk response planning;
- 4) Risk monitoring and control.

A project manager must be able to recognize and identify the root causes of the risks and to trace those causes to their consequences through the project **Error! Reference source not found.** In addition, risk management in construction project management is an inclusive and structured way of identifying, analyzing, and responding to risks for accomplishing the project objectives **Error! Reference source not found.**

1.4. Risk Identification

The risk identification process is undertaken in a planning phase which represents an early start to the project life cycle to be aware of the associated risks, therefore, and thus to effectively manage them. In the development project in the coastal area, all risks are investigated which will affect construction

execution, sustainable coastal development and finally leading to the completion of a successful project.

According to **Error! Reference source not found.** that the first step in the risk management process is primarily an informal step to identify possible risks based on past experiences.

Identifying possible risks is a task carried out by the organization regardless of how these risks are determined **Error! Reference source not found.** It is important to emphasize that risk management is not only about responding appropriately to risks, but is also about being well-prepared for the potential risks that occur unexpectedly **Error! Reference source not found.** Several techniques are usually used for risk identification, including brainstorming, interviews, questionnaires, consulting experts, Delphi technique, historical data and checklists **Error! Reference source not found.**

In this research, the risk has been identified through the following techniques

- 1) Documentation Analysis
- 2) Brainstorming
- 3) Interviewing

1.5. Documentation Analysis

The Documentation Analysis was the first method used to identify associated risks. The author is an architect and owns a design and construction company. Further has vast experience in restaurant development nationally. All archival data concerning restaurant development were taken into consideration such as previous projects lesson learned, financial statements, design scope, design manuals, organizational assets, resource allocation, sustainable environmental documents, and construction risks.

1.6. Brainstorming

All the experts regarding the development industry in the coastal area have a joined session in which everyone address and identify risk, even critically evaluating risk identification through historical Data. This method helped in generating new risks through discussion. Four sessions held to identify, scrutinize, and finalized the list of associated risk categories.

1.7. Interviewing

After compiling risk identification through brainstorming sessions, it has been shared with experts and been interviewed to help in finalizing the risk identification through their experience feedback and judgment the risk has been critically identified.

1.8. Risk Breakdown Structure

The identification of risks is the responsibility of every stakeholder involved in the project. To identify and to comprehend the risk breakdown structure (RBS) has been formulated to identify, comprehend, and assess risks in detail as it's an effective way to manage and to understand risks. As shown in figure 1. Research of integration of risk has been identified in seven categories.

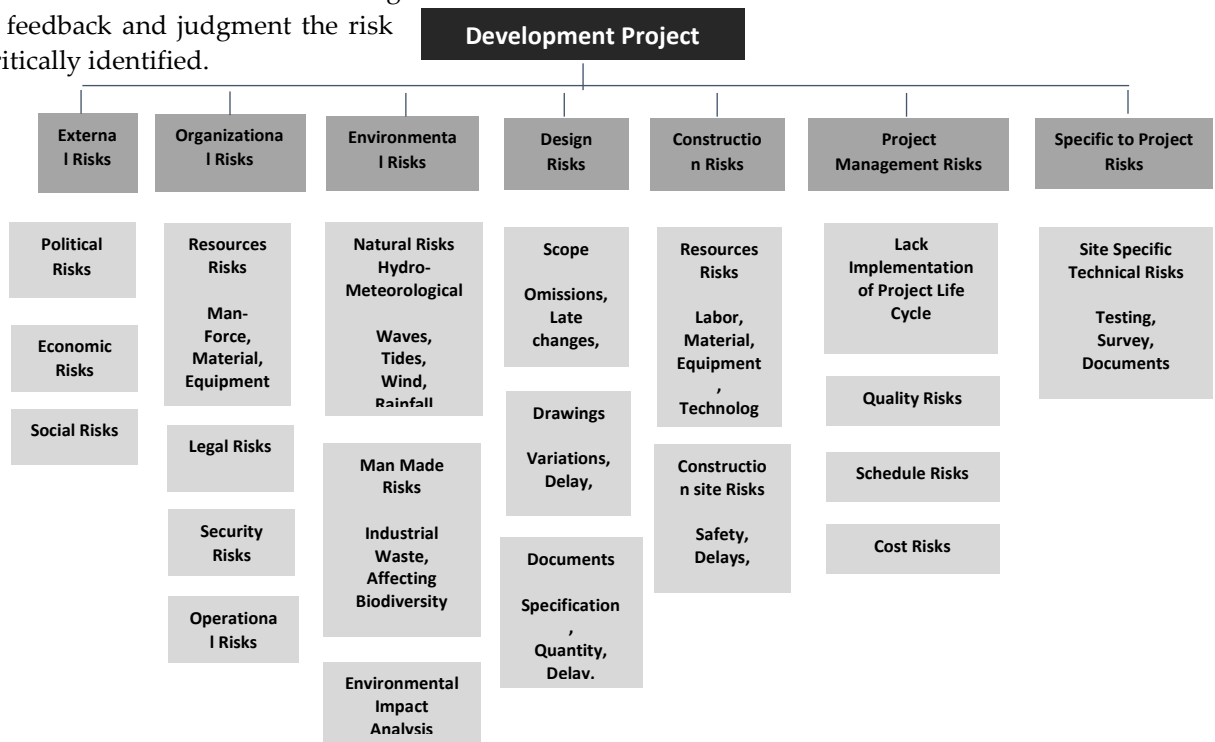


Figure 1. Development Risk Breakdown Structure

1.9. Risk Categories

1.9.1. External Risks

These risks are beyond the command of the project manager and project management team. The criteria to identify external risks are:

1.9.2. Political risks

Legislative structure, legislation, and policy and improper management framework changes in government rules, etc. **Error! Reference source not found..**

1.9.3. Economic risks

These are the economy inconstancy due to exchange rates, political instability, or government policies, rules, and regulation.

1.9.4. Social risks

These are the growing importance of any effort at risk allocation. It is an area in which political and social pressures from parties having little interest in a project but having a great impact on such a project greatly influences its outcome. **Error! Reference source not found..**

1.9.5. Organizational Risks

These are the risk which is also referred to as a part of internal risks. It's the risks that refer to organizational strategical objectives, resources both workforce, equipment, and material. It even relates to organization legal, security, and operational issues.

1.9.6. Environmental Risks

These are the risks also classified as part of external risks, which is over and beyond the command of the project management team. There are two criteria of environmental risks:

Natural risks due to meteorological conditions as the research is a project in the Coastal area. It is a

prime catalyst to identify risks related to hydro-meteorological conditions such as waves, tide, wind, and rainfall. Man-Made Risks are even described as environmental damages due to industrialization such as waste and developmental effects on Biodiversity, for which environmental impact analysis report is generated before development.

1.9.7. Design Risks

The building expansion has put immense burdens upon the design professions. It is quite difficult to maintain performance standards in the context and, occasionally, design or specification deflections occur that create construction problems **Error! Reference source not found..** The design failures lead later to construction/execution errors which result to sever risk to cost, quality, and schedule. Diminishing sustainable global perspectives that are Social, Environment, and Economical.

1.9.8. Construction Risks

These are the risks associated with the execution of the project on-site. The construction risks are defined as the following criteria. Resource Risks that are on-site human workforce, contractors, site engineers, labors, security guards, technicians, etc.. Another in material and equipment involved in the site for execution, their availability, quality, and cost affects the project.

1.9.9. Project Management Risks

This whole research paper revolves around project management knowledge and risk integration in a project. Project management constraints are mainly addressed to identify risks. These three constraints are Quality Risks Deflective work is considered a significant risk factor in this category as it leads not only to construction delays and additional costs for the contractor but also to disputes over the liability for deflection **Error!**

Reference source not found.. Schedule Risks an estimate of the delay, development and for all works can be calculated **Error! Reference source not found..** Cost risk. The cost of an opportunity product increases due to managerial neglect **Error! Reference source not found..**

1.9.10. Specific to Project Risks

In this research, these are the development risk specific to construction technical requirements about testing, survey, and documentation required for construction in coastal areas.

Table 1. Risk Identification (Risk ID, Risk Category, Risk Description)

I.D.	Risk Category	Risk Description
1001	External Risks	Commissions for approvals
		Lack of communication/ coordination between governmental
1003		Economical fluctuations due to dollar rate
1004		Tax Change
1005		Public objections, NGO's Coastal rights
2001	Organizational Risks	Incompetent staff workforce
2002		Delay in remittance and conveyance
2003		Resources unavailability and shortage
2004		Lack of Protection on a construction site
2005		Expired Construction permits
2006		Contradiction in documents
2007		Noncompliance of building codes, regulations, and
3001	Environmental Risks	The coastal area is the main catalyst of weather
3002		Coastal erosion
3003		The requirement of Flood reducing infrastructure
3004		Incomplete environmental impact analysis
3005		Hydro-meteorological behavior of Sea (Waves, Tides, Wind & Rainfall)
4001	Design Risks	Design errors / omissions
4002		Design deviation by Architect & Engineers
4003		Delay in the design process
		Failure to develop a design as accordance to contractual documents
4005		Stakeholders request late changes
5001	Construction Risks	Resources (Labor and Material) cost overruns
5002		Outdated technology and construction materials
5003		Tech labor not skilled
5004		Missing Tech points for construction at Coastal site
6001	Project Management Risks	Contractual quality requirements failure
6002		Frequent scope changes
6003		Lack of implementation of the project life cycle

6004	Project Team conflicts
6005	Budgeting errors
6006	Continuous changes and variations
7001	Specific to Project Missing required details like Bearing capacity
7002	Geotechnical drilling and soil sampling

1.10. Risk Register

The risk register is an output of the risk identification process. According to **Error! Reference source not found.** risk register is an active document that is continuously updated throughout during the project’s life cycle, and is a part of project documents and is incorporated in the historical records used for future projects. The risk register majorly includes:

- Risk Identification
- Risk Assessment (Analysis)
- Risk Responses

1.10.1. Risk Assessment

When risks are identified, they are analyzed to evaluate the impact of risks to plan necessary risks responses. The risk assessment process continues throughout the project life cycle, as the probability of risk might change in a later stage. Generally, risks

are analyzed in two categories Qualitative and Quantitative analysis.

1.10.1.1. Quantitative Risk Analysis

In this research, the survey has been conducted as a Quantitative Risk Analysis by developing a questionnaire, and share with experts to identify, evaluate the risk impact. In total 54 response has been collected.

1.10.1.2. Qualitative Risk Analysis

The Qualitative Risk Analysis has been developed and in comparison a much easier method to identify risk impact. Each identified risk is analyzed and evaluated in three categories that are probability, severity, and impact subjectively. The scale has been developed and formulated by a document analysis of similar previous projects and experience refer to Table 1.

Table 2. Rating Scale

Probability	Score	Severity	Score	Impact	Score
Almost certain	>0.8	Critical	>80	Catastrophe	>80
Quite possible	0.6 - 0.8	Major	60 - 80	Disaster	60 - 80
Unusual but possible	0.4 - 0.6	Moderate	40 - 60	Very serious	40 - 60
Remotely possible	0.2 - 0.4	Minor	20 - 40	Serious	20 - 40
Conceivable	0 - 0.2	Negligible	0 - 20	Important	0 - 20

Probability is a numerical description of how likely an event is to occur, a number between 0 and 1

where 0 indicate impossibility and 1 indicates certainty **Error! Reference source not found.**

Severity means a designation assigned to errors intended to indicate the seriousness of the error

Impact: A marked effect or influence

Further, the mean average score is formulated to develop the probability- consequences (PC)

matrix. The whole process is carried on Microsoft Excel Sheet. Below Table 2 shows PC Matrix, determined through data analysis to attain the effect associated with each risk.

Table 3. Risk Matrix / Probability- Consequences Matrix

Risk	Actions
Very High	Immediate Action
High	
Substantial	Medium Priority Short Term
Moderate	Medium Priority Long Term
Low	Low Priority
Acceptable	Acceptable

1.10.1.3. Risk Response

Risk response has been developed through document analysis and expert opinion after risk identification and evaluation. The response has

been developed to exclude the risk impact. In this research risks are identified are either mitigated, transferred, shared, or accepted.

Table 4. Risk Assessment(Risk Matrix / PC Matrix, Actions and Response

ID	Risk Description	Risk Matrix /PC Matrix	Actions	Response
1001	Commissions for approvals	Low	Low Priority	Accept
1002	Lack of communication/ coordination between governmental authorities	Substantial	Medium Priority Short Term	All documentation should be in writing Avoid verbal communication
1003	Economical fluctuations due to dollar rate	Low	Low Priority	For procuring services go for cost-reimbursable contract but for material go for Fixed Price
1004	Tax Change	Acceptable	Acceptable	Accept/ Adjust in contract
1005	Public objections, NGO's Costal	Low	Low Priority	Negotiate, Sign of environmental documents,

2001	Incompetent staff workforce	High	Immediate Action	The performance should be measured effectively,
2002	Delay in remittance and	Moderate	Medium Priority	In advance procurement. Proper parameters used for
2003	Resources unavailability and	High	Immediate Action	In advance procurement. Proper parameters used for scheduling
2004	Lack of Protection on a construction	Acceptable	Acceptable	Procure security services
2005	Expired Construction permits	Acceptable	Acceptable	Maintain construction permits dates through proper legal communication
2006	Contradiction in documents	Low	Low Priority	Maintain proper documentation files through communication model
2007	Noncompliance of building codes, regulations, and standards	Moderate	Medium Priority Long Term	Maintain proper documentation files through communication model
3001	Coastal area is the main catalyst of	Acceptable	Acceptable	Accept.
3002	Coastal erosion	Low	Low Priority	A building should not directly set on the ground level, Pilotis Structure
3003	A requirement of Flood reducing	Acceptable	Acceptable	Infrastructure needs to be properly designed
3004	Incomplete environmental impact analysis	Acceptable	Acceptable	Involve environmentalist in start and sign of documents developed
3005	Hydro-meteorological behavior of Sea (Waves, Tides, Wind & Rainfall)	Low	Low Priority	Accept. Work will commence after adverse sea behavior
4001	Design errors / omissions	Moderate	Medium Priority Long Term	In every phase, the design should be sign off by relevant stakeholders after review to avoid error

4002	Design deviation by Architect & Engineers	Low	Low Priority	Involve the quality department to develop a checklist to avoid deviations
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1.11. Contingency Plan

A risk contingency plan in a construction project allows flexibility and efficient responses to changes in orders and unanticipated risks occurring during the project construction process. **Error! Reference source not found..** It begins with the size of the project before analyzing other factors that thus enable the project to create a baseline for uncertainties within the project. **Error! Reference source not found..**

In this research we have developed a risk register following all the processes of identification, assessment to analyze and evaluate, and effective risks response to reduce or eliminate risks impact. Contingency plans are developed especially looking into the factor of residual risks, which even remain in the after effective risk response.

Key factors to be considered in planning the contingency in development projects, such as,

- Project scope as it affects the majority of risks identified, that is in design risks, construction risks, environmental risks, and

project management risks; leads to cost overruns, quality is compromised and delay.

- Qualified workforce either within the organization or procuring services as technical experts or laborers. The contingency plan should we developed to look into workforce resources hiring, allocation, training, or alternative.
- In Pakistan especially consideration of external risk factors associated with political crises such as immediate closure due to law and order situation, the governmental structure of commissions and social obligations leading cost to legal requirements.
- The coastal area is a catalyst for adverse weather conditions, its completely uncertain risk which is beyond project team control. Due to hydro-meteorological behavior and biodiversity, it required proper environmental impact assessment to help in developing a contingency plan.

Table 5. Contingency Plan

ID	Risk Description	Risk Matrix	Actions	Response	Contingency Plan
1001	Commissions for approvals	Low	Low Priority	Accept	Balance in a project cost
1002	Lack of communication/ coordination	Substantial	Medium Priority Short Term	All documentation should be in writing Avoid verbal communication	A legal advisor will be hired in case of communication gap

1003	Economical fluctuations due to dollar rate	Low	Low Priority	For procuring services go for a cost-reimbursable contract but material go for Fixed Price	Claimed as per the contractual obligation
2001	Incompetent staff workforce	High	Immediate Action	The performance should be measured effectively,	Training and Workshop according to skill. Motivational Session
2002	Delay in remittance and conveyance	Moderate	Medium Priority Long Term	Advance procurement. Proper parameters used for scheduling	List of Alternative Supplier should be maintained
2003	Resources unavailability and shortage	High	Immediate Action	Advance procurement. Proper parameters used for scheduling	A list of Alternative Suppliers Should be maintained. The material specification will change. The demand for more Implementation of a proper technical
3002	Coastal erosion	Low	Low Priority	A building should not directly set on the ground level, Pilotis Structure	Survey and environmental expert opinion. Design and construction method
3005	Hydro-meteorological the behavior of	Low	Low Priority	Accept. Work will commence after adverse sea behavior	Site Insurance
4001	Design errors / omissions	Moderate	Medium Priority Long Term	In every phase, the design should be signed off by relevant stakeholders after review to avoid error	A schedule needs to be Reconsidered, by demanding extra time or manage through fast-
4002	Design deviation by Architect	Low	Low Priority	Involve the quality department to develop a checklist to	Rescheduling, more time required.
5001	Resources (Labor and	Substantial	Medium Priority Short Term	Develop proper procurement staff to avoid cost overruns	Look into effective contract legal terms. Claimed as per the contractual obligation
5003	Tech labor not skilled	Very High	Immediate Action	Thoroughly monitored and test capabilities before involving in the project	Site Engineers should have The knowledge to monitored technical people. Alternative technical labors in a loop or involved immediately

6002	Frequent scope changes	Very High	Immediate Action	In every phase project, all stakeholders should review and sign off to avoid scope changes	Re payment but a client to Architect and engineers in case of scope change should be mentioned in the contract to avoid such changes. More time required and cost will be
6004	Project Team	Very High	Immediate Action	Develop proper communication models with designated roles and responsibilities.	Minutes of Meeting to be maintained. Team building workshop
6005	Budgeting errors	Moderate	Medium Priority Long Term	Review by a proper financial expert to avoid variances	Cost need to be adjusted
6006	Continuous changes and variations	High	Immediate Action	In every phase project, all stakeholders should review and sign off to avoid scope changes	Rescheduling, more time required

Findings

In this research, by integrating risk management processes and methodologies 34 risks have been identified.

Table 3: Risk Scores

Risk Categories							
	External Risks	Organizational Risks	Environmental Risks	Design Risks	Construction Risks	Project Management Risk	Specific to Project Risks
Risks	Very High				81.67	178.33	
	High		91			5	
	Substantial	37.33			37.33		
	Moderate		53		30	25	
	Low	42.67	15	28.33	15	20	33.34
	Acceptable	0.6	2.66	13.34	4	10.67	8
	Total	80.6	161.66	41.67	49	129.67	236.33

Total Risk Score	732.27
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Table 3 concludes which risk categories are associated with the highest risk score. Below is ranking from highest to least, that is

- 1) Project Management; Risk score result in highest i.e 236.33
- 2) Construction; Risk score is second highest i.e. 129.67
- 3) Organizational; Risk score is 161.66
- 4) External; Risk score is 80.6
- 5) Design; risk score is 49
- 6) Environmental; Risk Score is 41.67
- 7) Specific to Project; Risk score is the least 33.34

Further, we can even evaluate from this above table impact of risk determined in each category to comprehend the importance of each risk category in

the development project of restaurants in the coastal areas.

- 1) Project Management; Risk Score 236.33 / Total Risks 6 = 39.38 result as 'Substantial Risk'
- 2) Construction; Risk Score 129.67 / Total Risks 4 = 32.41 result as 'Moderate Risk'
- 3) Organizational; Risk Score 161.66 / Total Risks 7 = 23.04 result as 'Low Risk'
- 4) Specific to Project; Risk score 33.34 // Total Risks 2 = 16.67 result as 'Low Risk'
- 5) External; Risk Score 80.6 / Total Risks 5 = 16.12 result as 'Low Risk'
- 6) Design; Risk Score 49 / Total Risks 5 = 9.8 result as 'Acceptable Risk'
- 7) Environmental; Risk Score 41.67 / Total Risks 7 = 5.9 result as 'Acceptable Risk'

Total Project Score Evaluation

Project Score = Σ Risk Score / No. of Risks
Project Score = 732.27 / 34 =21.53
Project Score = 21.53 \approx 22

2. CONCLUSION

Integration of risk management in the development of restaurants in the coastal area 'Do Darya' assists to identify, analyze, and evaluate the risk to make the project successful.

Its comparatively new type of project and challenging to convince investors and developers to commence a restaurant project in the coastal area, Karachi. In this research total, 34 risks have been identified in 7 risk categories.

The project score is approx. 22, which means the project is at low risk and it is a high potential

development project which is manageable. Mostly it can be easily manageable through effective risk response mentioned but the contingency plan has maintained to raise the benchmark of the development project in the coastal area, Karachi.

As project management risks are highest among other risk categories. It is recommended that the project manager should be assigned authority as a directive level in development projects from initiation to closing to reduce and eliminate risks associated with the project. The organizational structure of the development sector should be projectized structure so that the project manager has

maximum authority level to analyze, evaluate and recommend cost, quality, and schedule in initiation level and other knowledge areas.

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