

## **ASSESSMENT OF VERY CRITICAL RISK FACTORS IN REAL ESTATE SECTOR BY CRITICALITY INDEX**

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*Abstract: The real estate sector in India obtained greater prominence with the liberalization of the economy, as the consequent increase in business opportunities and labour migration which has provided a framework to rising demand for commercial and housing space. The boom in the real estate and construction sectors are purveying a crucial role in the overall development of India's core infrastructure. The importance and urgency of understanding the performance of risk management is due to fast growing economy. This study aims at finding the risk factors which affects the real estate sector and are challenging the risk management in real estate sector. Criticality index method is used to rank the factors and rate the criticality of the factors. About 72 risk factors affecting the real estate risk management were identified and divided into main 8 risk categories. The entire research work is done on the combined perception of different stake holders from Ahmedabad city and top 15 risk factors have been identified. The survey work is done in Ahmedabad city.*

**Keywords:** Criticality Index, Real Estate, Risk Management, Risk Factors

### **I. INTRODUCTION**

“Real estate” one of the only perennial and traditionally preferred asset class and also with the inborn desire of Indians to own a house, this sector has become a natural choice for the excesses to be invested. This sudden spurt in demand caught the fancy of investors globally. The real estate sector in India obtained greater prominence with the liberalization of the economy, as the consequent increase in business opportunities and labour migration which has provided a framework to rising demand for commercial and housing space. The boom in the real estate and construction sectors are purveying a crucial role in the overall development of India's core infrastructure.

The Indian real estate sector has traditionally been dominated by a number of small regional players with relatively low levels of expertise and financial resources. Historically, the sector has not benefited from institutional capital; instead, it has traditionally tapped high net-worth individuals and other informal sources of financing, which has led to low levels of transparency. Today, the real estate industry's dynamics reflect consumers' expectations of higher quality with India's increasing integration with the global economy. The importance and urgency of understanding the performance of risk management is due to fast growing economy. This study aims at

finding the risk factors which affects the real estate sector and are challenging the risk management in real estate sector. Criticality index method is used to rank the factors and rate the criticality of the factors. About 72 risk factors affecting the real estate risk management were identified and divided into main 8 risk categories. The entire research work is done on the combined perception of different stake holders and top 15 risk factors have been identified.

## II. NEED OF THE STUDY

The study aims at providing a panoramic view of the risks in real estate sector and investigates the slow pace of real estate market in Ahmedabad city by the perceptions of six different stakeholders including the Engineers, Developers, Valuers, Town Planners, Academicians and Architects. The work aims at rating the criticality of each risk factors and ranking the top most critical risks.

## III. OBJECTIVES OF THE STUDY

The main objectives of the research work are as follows:

1. To rank the risk factors according to the perceptions of people associated with the real estate sector.
2. To identify the most critical risk and risk factors in Ahmedabad real estate projects.

## IV. RESEARCH METHODOLOGY

Moving on towards the details of research methodology and techniques it is important to have a glance on the research process. Research process is series of actions or steps necessary to effectively carry out research and the desired sequencing of these steps. Figure 1 well illustrates a research process adopted in this research work.

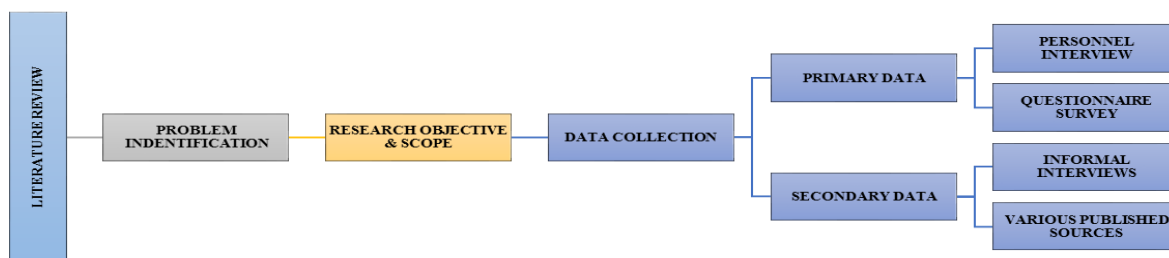


Figure 1: Research Methodology

### A. Problem Identification

No This study aims at providing a panoramic view of the risks in real estate sector and investigates the slow pace of real estate market identifying the key drivers that lead to the risk. The importance and urgency of understanding the performance of risk management is due to the highlighted fast growing Indian economy. This research explains which risks have burgeoned along the real estate sector and focus on the Indian characteristics.

### B. Data Collection

The data collection stage is one of the crucial stage of the research process which provides an input to the data analysis stage. For this research the data will be collected as two forms first is primary data collection and other is secondary data.

Primary data includes information collected from sources such as personal interviews, questionnaires surveys which is concerned with a specific intention and on a specific subject

and observation and discussion by the researcher him or herself and can be self-assessed further. It is a direct approach.

Secondary data includes information already available somewhere, whether it be in journals or on the internet, publications or records. Secondary data allows for comparison.

*C. Criteria for Risk Identification*

On the basis of the critical literature review from Literature published in various national, international and other online and local journals; national, international and other conferences; various reports; master and Ph.D. dissertations; books; various standards published by various authorities; etc. the various factors representing the risk factors of the real estate industry. Total 72 factors were found falling under 8 major risk categories. The major risk categories were Technical, Economical, Social, Legal, Strategic, Financial, Marketing and Natural.

*D. Questionnaire Survey Approach*

The questionnaire designed on the bases of the literature review was distributed among various stakeholders in the region of Ahmedabad city. The city is to be divided into 5 distinct zones and data collected from each zone was analyzed. This research work focuses on only residential real estate sector.

*E. Data Collection*

The survey work was carried out within the scope of the study and among the selected respondents of the sample. The questionnaires was distributed among respondents in all the five zones of Ahmedabad and data was collected through these filled questionnaires. By these questionnaires the perceptions of respondents with regarding to risk factors affecting real estate industry were determined.

The different zones of Ahmedabad city taken for the research are shown in Table 1.

**TABLE 1: - ZONES OF AHMEDABAD TAKEN FOR THE RESEARCH WORK**

<b>ZONE NO.</b>	<b>ZONE NAME</b>	<b>AREAS COVERED</b>
1	Central Ahmedabad	Ashram Road, C. G. Road, Navarangpura, Paldi, Usmanpura, Vasna.
2	North Ahmedabad	Chandkheda, Motera, Ranip, Sabarmati
3	South Ahmedabad	CTM, Ghodasar, Isanpur, Jasodanagar, Maninagar, Narol, Vatva
4	East Ahmedabad	Hansol, Naroda, Nikol, Shahibaug
5	West Ahmedabad	Bodakdev, Bopal, Jodhpur, Makarba, Prahaladnagar, Satellite, Thaltej, Vastrapur, Vejalpur

*F. Questionnaire distribution and collection*

Out of 120 questionnaires sent though hardcopies and mails, 87 responses were received. The responses were obtained after personal requests and visits to their respective offices. 87 responses collected i.e. 72.5% response rate which is considered very good for this kind of survey. Though the total number of questionnaires sent and the responses received were limited, the survey covered most of the known experts and consultants of the real estate projects in Ahmedabad. The reliability of the survey results is expected to be high because all the respondents are top-level experienced stakeholders.

**V. RANKING OF THE RISK FACTORS BY CRITICALITY INDEX METHOD**

The ranking method used for the research is criticality index method through which a criticality index of each factor can be found and ranking of the factors though overall comparison can be made.

*G. Introduction of Criticality index*

In this research for all questions the five point likert scale is used. Likert scale is a unidimensional scaling method generally used for measuring ordinal variables. Based on the criticality rating of each category of respondents criticality index was evaluated for each risk. The index used for measuring risk criticality:

$$Criticalixty\ Index = \frac{(5n1 + 4n2 + 3n3 + 2n4 + n5)}{5(n1 + n2 + n3 + n4 + n5)}$$

Where,

*n1* = number of respondents who answered “Most Critical”;

*n2* = number of respondents who answered “Very Critical”;

*n3* = number of respondents who answered “Critical”;

*n4* = number of respondents who answered “Some What Critical”; and

*n5* = number of respondents who answered “Not Critical”.

The criteria used for risk classification is given in Table 2

**TABLE 2:- CRITERIA FOR RISK AS PER CIM**

RISK CRITICALITY	CRITERIA
Not critical	Criticality index ≤ 0.50
Critical	Criticality index >0.5 to ≤0.7
Very critical	Criticality index >0.7 to ≤0.9
Most critical	Criticality index > 0.9

**TABLE 3:- TECHNICAL RISK RANKING BY CIM**

TECHNICAL RISK FACTORS		COMBINED		NATURE OF IMPORTANCE
		CI	RANK	
1	Incomplete design	0.7767	1	VC
2	Inappropriateness of specification	0.6437	5	C
3	Uncertainty of material unavailability	0.5885	10	C
4	Ineffective design updating	0.6391	6	C
5	Checklist & methodology risks	0.5701	13	C
6	Information and communication	0.6092	8	C
7	Accidents risks	0.5448	15	C
8	Site condition inappropriateness	0.6138	7	C
9	Faulty designers and construction	0.7632	2	VC
10	Duration	0.6989	3	VC
11	Accessibility and evacuation	0.5655	14	C
12	Completion risk	0.6023	9	C
13	Prolonged contractor strikes	0.5724	12	C
14	Inexperienced developers	0.6488	4	C
15	Obsolescence risk	0.5839	11	C

The ranking of the factors is done on the combined perceptions of the Developers, Engineers, Valuers, Town Planners, Architects and Academicians. From the table 3, the top five factors in the decreasing order of the criticality index are incomplete design, faulty designers and construction, duration, experienced developers and inappropriateness of specification. Incomplete design, faulty designers and constructions and duration are ranked as “Very Critical” factors. There is none factor which is Most Critical and prolonged contractor strikes is ranked as not critical factor.

**TABLE 4:- ECONOMICAL RISK RANKING BY CIM**

ECONOMICAL RISK FACTORS		COMBINED		NATURE OF IMPORTANCE
		CI	RANK	
16	Pre investment risk	0.6299	7	C
17	Resettlement & rehabilitation risk	0.5908	13	C
18	Delay in land acquisition risk	0.6442	4	C
19	Cost over run	0.7103	1	VC
20	Interest rate	0.6759	3	VC
21	Property type	0.5442	15	C
22	Market liquidity	0.6118	9	C
23	Demand and supply	0.6828	2	VC
24	Debt risk	0.6349	5	C
25	Brand visibility	0.6047	11	C
26	Capital exposure	0.6217	8	C
27	Lifecycle value	0.6302	6	C
28	Buyers/tenants	0.5977	12	C
29	Investment risk	0.6116	10	C
30	Insurance risk	0.5678	14	C

The ranking of the factors is done on the combined perceptions of the Developers, Engineers, Valuers, Town Planners, Architects and Academicians. From the table 4, the top five economical risk factors in the decreasing order of the criticality index are cost overrun, interest rate, demand and supply, delay in land acquisition and debt risk. Cost overrun, interest rate and demand and supply, are ranked as “very critical” factors. There is none factor which is most critical. Remaining factors are considered as critical.

**TABLE 5:-SOCIAL RISK RANKING BY CIM**

SOCIAL RISK FACTORS		COMBINED		NATUR OF IMPORTANCE
		CI	RANK	
31	Urban planning	0.6736	2	VC
32	Regional planning	0.6046	7	C
33	Public intervention	0.6093	5	C
34	Community acceptance	0.6092	6	C
35	Social security	0.5724	8	C
36	Immoral developers	0.6230	4	C
37	Customer relationship management risk	0.6598	3	C
38	Workforce availability	0.6874	1	VC

The ranking of the factors is done on the combined perceptions of the Developers, Engineers, Valuers, Town Planners, Architects and Academicians. From the table 5, the top five social risk factors in the decreasing order of the criticality index are workforce availability, urban planning, customer relationship management, immoral developers and public intervention. Workforce availability and urban planning is rated as “very critical” risk factor. No factor is rated as most critical. All the risk factors are considered as critical.

**TABLE 6:- LEGAL RISK RANKING BY CIM**

LEGAL RISK FACTORS		COMBINED		NATUR OF IMPORTANCE
		CI	RANK	
39	Political risks	0.6253	5	C
40	Partnership risks	0.5862	7	C
41	Regulatory risk	0.6092	6	C
42	Permit and approval risk	0.6460	2	C
43	Change in zone risk	0.6322	4	C
44	Laws and regulations	0.6506	1	VC
45	Change in building bye laws	0.6414	3	C
46	Change in taxation code	0.5839	8	C
47	Change in accounting rules	0.5586	9	C

The ranking of the factors is done on the combined perceptions of the Developers, Engineers, Valuers, Town Planners, Architects and Academicians. From the table 6 , All the legal risk are ranked as critical factors and first three factors in decreasing order of the criticality are laws and regulations, permit and approval risk and change in building bye laws. Laws and regulation is rated as “very critical” risk factor. No factor is rated as most critical and other factors are rated as critical.

**TABLE 7:-STRATEGIC RISK RANKING BY CIM**

STRATEGIC RISK FACTORS		COMBINED		NATUR OF IMPORTANCE
		CI	RANK	
48	Competitions risk	0.6483	2	C
49	Administrative / governance risk	0.5770	10	C
50	Reputation risk	0.6483	2	C
51	Survival in market	0.6092	6	C
52	Innovation	0.6161	5	C
53	Transparency	0.6667	1	VC
54	Professionalism	0.6483	2	C
55	Information system for decision making	0.6000	7	C
56	Records	0.5839	8	C
57	Development exposure	0.5839	8	C

The ranking of the factors is done on the combined perceptions of the Developers, Engineers, Valuers, Town Planners, Architects and Academicians. From the table 7, all strategic risk factors have been rated as critical. The top three factors are transparency, professionalism and



competition risk. Transparency is considered as very critical risk factor. Other factors are rated as critical.

**TABLE 8:-FINANCIAL RISK RANKING BY CIM**

FINANCIAL RISK FACTORS		COMBINED		NATUR OF IMPORTANCE
		CI	RANK	
58	In availability & fluctuation in foreign exchange	0.4952	8	NC
59	Delay of payment	0.6759	1	VC
60	Inflation risk	0.6621	2	C
61	Local taxes	0.5862	6	C
62	Delay in financial enclosure	0.6253	3	C
63	Lease length	0.5172	7	C
64	Financial strength	0.6253	3	C
65	Bargaining power of developer	0.6000	5	C

The ranking of the factors is done on the combined perceptions of the Developers, Engineers, Valuers, Town Planners, Architects and Academicians. From the table 8 , the top three factors in the decreasing order of the risk criticality are delay in the payment inflation risk and delay in the financial enclosure. The unavailability and fluctuations in the foreign exchange have been rated as not critical factor. delay in the payment is rated as “very critical” risk factor.

**TABLE 9:-MARKETING RISK RANKING BY CIM**

MARKETING RISK FACTORS		COMBINED		NATUR OF IMPORTANCE
		CI	RANK	
66	Distribution risk	0.5471	5	C
67	Cash flow risk	0.6598	2	VC
68	Efficiency risk of client	0.6253	3	C
69	Labour /market price fluctuation	0.6230	4	C
70	Market downturn	0.6989	1	VC

The ranking of the factors is done on the combined perceptions of the Developers, Engineers, Valuers, Town Planners, Architects and Academicians. From the table 9, market downturn and cash flow risk are rated as very critical.no factor is rated as most critical.

**TABLE 10:- NATURAL RISK RANKING BY CIM**

NATURAL RISK FACTORS		COMBINED		NATUR OF IMPORTANCE
		CI	RANK	
71	Environmental risk	0.6207	1	C
72	Geological conditions	0.5977	2	C

From the figure 10 it is clear that both the natural factor have been rated critical. The overall rating and ranking shows that there are 15 very critical risk factors for Ahmedabad residential real estate sector which are show in table 11.

**TABLE 11:-VERY CRITICAL RISK FACTOR RANKED BY CIM**

TECHNICAL RISK	ECONOMIC RISK	SOCIAL RISK	LEGAL RISK	STRATEGIC RISK	FINANCIAL RISK	MARKETING RISK	NATURAL RISK
RANK	CODE	FACTOR					CI
1	1	Incomplete Design					0.7767
2	9	Faulty Designers And Construction					0.7632
3	19	Cost Over Run					0.7103
4	10	Duration					0.6989
5	70	Market Downturn					0.6989
6	38	Workforce Availability					0.6874
7	23	Demand And Supply					0.6828
8	20	Interest Rate					0.6759
9	59	Delay Of Payment					0.6759
10	31	Urban Planning					0.6736
11	53	Transparency					0.6667
12	60	Inflation Risk					0.6621
13	37	Customer Relationship Management Risk					0.6598
14	67	Cash Flow Risk					0.6598
15	44	Laws And Regulations					0.6506

**VI. CONCLUSION**

- a) Overall combined ranking considering the perception of all the stakeholders is done. Based on the risk criticality analysis, 15 risk factors have been identified as “very critical” in Ahmedabad real estate projects.
- b) In the decreasing order of the criticality they are: incomplete design, faulty designers and construction, cost overrun, duration, market down turn, workforce availability, demand and supply, interest rate, delay in payment, urban planning, transparency, inflation risk, customer relationship management, cash flow risk and laws and regulations. The risk factors in the decreasing order of the criticality are as shown in the table 11.
- c) Only one risk has been identified as not critical for Ahmedabad real estate sector ie. inavailibilty and fluctuation in foreign exchange
- d) Critical and very critical risk factors identified by the CIM considered shall be further taken for the preparation of a risk management model

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