Identification of Major Risk factors in Real Estate Sector of Ahmedabad, Gujarat: Perception Analysis

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Abstract: *The purpose of this research is to identify the main problems and challenges of risk management in the Indian real estate companies to explore solutions for risk management in context to Ahmedabad residential Real estate projects. The research is partly based on a survey of people who are directly or closely related to the management and the real estate industry in India. The questionnaire Survey is done accros the five main zones of Ahmedabad city. This paper is planned to deal with identification of the main critical risk factors influencing the residential real estate market and hence giving solution for better risk management strategy.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 by portraying Gujarat. In this research, criticality index method which is used to find the criticality of risk is used as a criteria for identifying the critical risks.*

Key Words: *Criticality Index Method, Real Estate sector, Risk Management.*

1. INTRODUCTION:

Investment in property is believed to be the smartest move as chances of loss is moderately negligible. Real estate sector is also called as revenue generating sector. Indian real estate sector is one of the most beneficial industrial sectors in the country through the employment opportunities in construction or the contribution towards the Gross Domestic Product (GDP). The new government with the relaxed policies relating to foreign investment or the entire construction industry will definitely attract more investors and buyers too will have a good range of options to choose from. From the last few years there has been an increasing demand of real estate market which according to some experts will lead to the strong growth of India. It is forecasted that India will share a GDP in the world from the current 6% to 11% in 2015. This will make India as a third pole in the global economy after US and China. Risk management in the real estate has gained a sheer bull run in order to survive with the challenges they are facing regarding their internal actions as well as the external interaction with other parties. Looking at the survival of the most of the organizations it is learned that these organizations have sustained the inherent risky nature of real estate development. This sustenance could not merely have been a matter of sheer luck. However not enduring to their built up experience and interest in risk management, there is a lack of insight and knowledge about the way real estate development organizations actually deal with risk. The fact is that the real estate's development is complex and more risky and this may require knowledge and insight in order to professionalize the real estate development process. This research explains which risks have burgeoned along the real estate sector and focus on the Indian characteristics. In this research, criticality index method which is used to find the criticality of risk is used as criteria for identifying the critical risks. On the basis of personal interviews with the people directly related to realty sector and the literature, various factors representing the risk factors of the real estate industry are found i.e. 72 factors were found falling under 8 major risk categories like technical, economical , social,financial,legal,natural,strategic and marketing.The questionnaire for the survey was designed with two objectives:

- To identify the most critical risks in the real estate sector and ,
- To explore solution to risk management in the real estate sector based on the perception of real estate participants of Ahmedabad.

The survey work for data collection was carried out among six main stakeholders of the real estate projects- Engineers, Developers, Architects, Valuers, Town Planners and Academicians.

2. SAMPLE SIZE CALCULATION:

To obtain statistically representative sample size of the population, following equation used:

$$n = \frac{NZ^2(pq)}{NT^2 + Z^2(pq)}$$

Where,
n = adjusted sample size
Z = level of confidence (1.96 and 1.645 for 95% and 90% confidence level respectively)
T = allowable tolerance of variation (0.1)
N = population size
p =probability of occurring event (0.60)
q =probability of non-occurring event (0.40)
The table 1.1 gives the details of the population size of the stakeholders as considered for the calculation of the sample size in the research work.

Table 1.1 Stakeholders details

Stakeholders	Population size	Source
Architects	80	Auda.org.in
Developers	162	Auda.org.in
Engineers	299	Auda.org.in
Financiers	28	Gujarathousingbank.org
Urban planner	50	Institute of town planning
Academicians	42	Researchers (CEPT,GTU,PDPU,INDUS,IIT)

According to the targeted City and Stakeholders, the total number of available population comprises of 659 construction firms. The data is collected from the Ahmedabad Urban Development Authority (AUDA) & lists of registered construction firms of various government departments in construction in Ahmedabad.
Thus,

$$n = \frac{659 * 1.96^2(0.60 * 0.40)}{659 * 0.1^2 + 1.96^2(0.60 * 0.40)}$$
$$n = 81$$

From the above calculation it is interpreted that minimum 81 respondents should contacted for the research study. To overcome the risk of not responding from the respondents and to reflect higher reliability and benefits from the study, the sample of 87 respondents were considered. The survey work is carried out in the following zones of Ahmedabad city as shown in the table 1.2.

Table 1.2 Different Zones of Ahmedabad City to be taken in the Research Work

Zone No.	Zone Name	Areas Covered
I.	Central Ahmedabad	Ashram Road, C. G. Road, Navarangpura, Paldi, Usmanpura, Vasna.
II.	North Ahmedabad	Chandkheda, Motera, Ranip, Sabarmati
III.	South Ahmedabad	CTM, Ghodasar, Isanpur, Jasodanagar, Maninagar, Narol, Vatva
IV.	East Ahmedabad	Hansol, Naroda, Nikol, Shahibaug
V.	West Ahmedabad	Bodakdev, Bopal, Jodhpur, Makarba, Prahaladnagar, Satellite, Thaltej, Vastrapur, Vejalpur

3. 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. The summary of the survey responses are shown through frequency analysis in the following portion.

4. DATA ANALYSIS:

Frequency Analysis and Interpretation of Stakeholders

Table 1.3 Number of Respondents Experience Wise

No. of Respondents Experience Wise		
<5 years	1	19
5-10 years	2	25
10-15 years	3	17
15-20 years	4	5
>20 years	5	21
Total		87

The responses obtained were dived into 5 main experience group. The summary of the responses obtained is shown in table 1.3. Figure 1 shows the graphical representation of the responses obtained from different respondents based on the experience.

Table 1.4 Numbers of Responses from Different Stakeholders Experience Wise

Category of respondents	No. Of respondents Experience In Years					Total	Percentage %
	<5 years	5-10 years	10-15 years	15-20 years	>20 years		
Enginners	5	10	4	3	6	28	32.18%
Developers	4	3	6	3	4	20	22.99%
Valuers	1	0	2	3	4	10	11.49%
Architects	6	2	3	1	4	16	18.39%
TP	0	1	3	0	3	7	8.05%
Academicians	2	3	0	0	1	6	6.90%
Total	18	19	18	10	22	87	100%
Percentage	20.68%	21.83%	20.68%	11.49%	25.28%	100%	

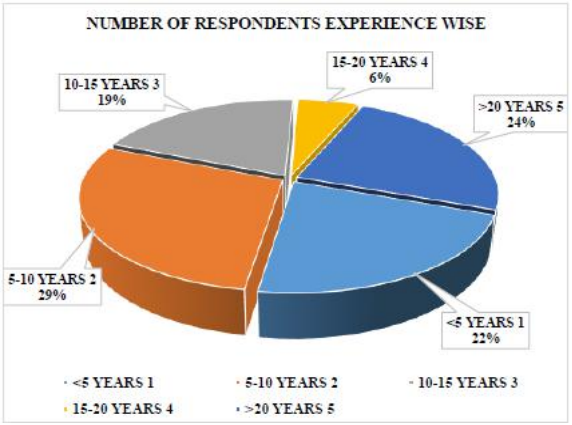

Figure 1 Number of Respondents Experience Wise

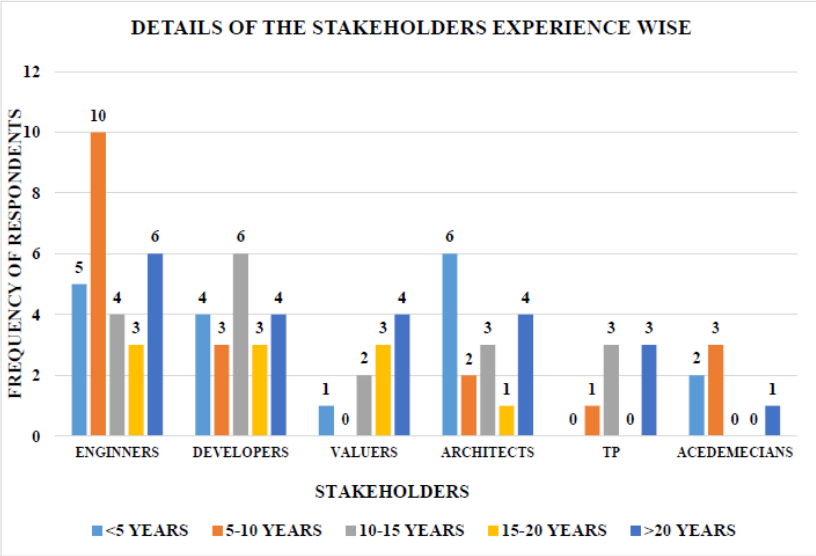

Figure 2 Details of the Stakeholder Experience Wise

The number of the responses obtained from individual stakeholders experience wise is shown in table 1.4 and figure 52.From figure 2 it can be interpreted that the maximum responses were from the engineers' side having experience of 5- 10 years. There were 22 respondents having more than 20 years of experience which can help to get a better analysis of the factors.The methodology adopted for increasing the response rate was regular email and telephonic follow-ups. The credibility of various institutions and associations related to the real estate projects like GICEA and Real Estate Project Expo also contributed to the relatively good response rate. Table 1.5, figure 3 and 4 shows the number of responses from different stakeholders zone wise.

Table 1.5 Number of Responses from Different Stakeholders Zone wise

Category of respondents	No. Of respondents					Total	Percentage
	Zones of Ahmedabad						
	North	East	West	South	Central		
Developer	2	1	6	2	9	20	22.99 %
Engineer	2	2	8	3	13	28	32.18 %
Academician	0	0	2	1	3	6	6.90 %
Valuer	1	1	3	1	4	10	11.49 %
Architect	1	2	5	1	7	16	18.39 %
Town planners	1	0	2	1	3	7	8.05 %
Total	7	6	26	9	39	87	100.00 %
Percentage	8%	7 %	30 %	10 %	45 %	100 %	

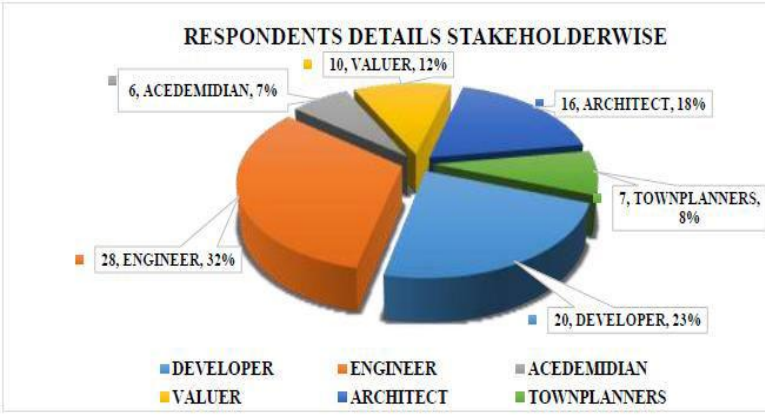

Figure 3 Respondents Details Stakeholder Wise

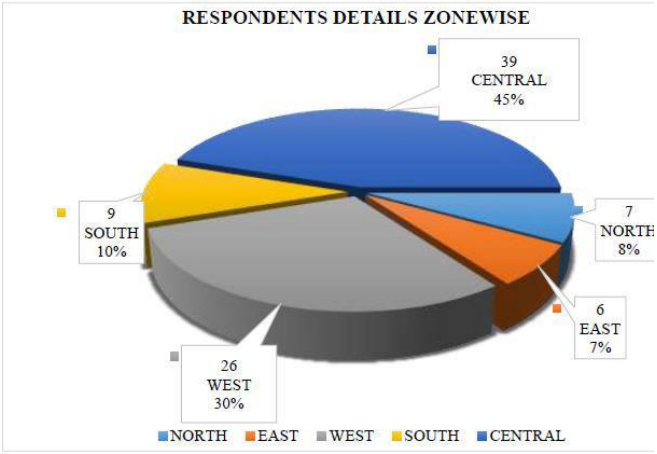

Figure 4 Respondents Details Zone Wise

From figure 4 it can be interpreted that the responses from the central zone were maximum i.e 39% and the lowest number of responses were from the east zone. i.e. 6%.

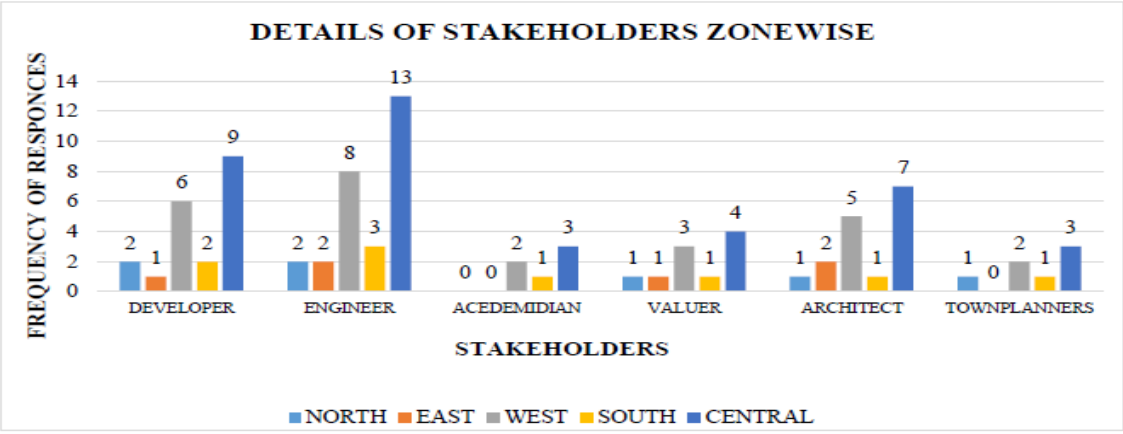

Figure 5 Details of the Stakeholder Zonewise

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The figure 5 represents the graphical presentation of the stakeholder responses from various zones. The maximum number of the responses collected was from the engineers and that too from the north zone. The lowest responses obtained were from academicians from each zone and also overall responses were low.

5. DATA ANALYSIS BY RANKING METHOD: CRITICALITY INDEX METHOD (CIM):

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. The criticality rating scale was used to rank the risk factors and the indexing is shown in Table 1.6. The Table shows the ranking of the technical factors based on Critical Index Method.

Table 1.6 Rating system for criticality index method

Rating score	Criticality of risks	Criteria
1	Not critical	Criticality index ≤ 0.50
2	Somewhat critical	Criticality index >0.5 to ≤0.7
3	Critical	
4	Very critical	Criticality index >0.7 to ≤0.9
5	Most critical	Criticality index > 0.9

The ranking of the factors is done on the combined perceptions of the Developers, Engineers, Valuers, Town Planners, Architects and Academicians. The table 1.7 shows the criticality index rating of various stakeholders for various factors of technical risk factor category. The highlighted cells shows the top five risk factors based on combined ranking by (Criticality Index Method) CIM. The categories are highlighted in this paper by their respective colours.

Table 1.7 Technical Risk Ranking Based On Criticality

TECHNICAL RISK FACTORS		ENGINEER		DEVELOPER		VALUER		ARCHITECT		TP		ACEDEMICIAN	
		CI	RANK	CI	RANK	CI	RANK	CI	RANK	CI	RANK	CI	RANK
1	Incomplete design	0.7143	1	0.7600	1	0.6889	3	0.9250	1	0.8000	2	0.8333	1
2	Inappropriateness of specification	0.6571	7	0.6600	4	0.6600	4	0.6500	8	0.4571	14	0.7000	3
3	Uncertainty of material unavailability	0.6071	10	0.5600	9	0.3800	12	0.6250	11	0.7714	3	0.6333	7
4	Ineffective design updating	0.6815	5	0.6100	7	0.6200	5	0.6500	8	0.5714	11	0.6333	7
5	Checklist & methodology risks	0.6071	10	0.4900	13	0.5600	6	0.6750	7	0.4857	13	0.5000	14
6	Information and communication	0.6786	6	0.5500	10	0.3800	12	0.6500	8	0.7429	6	0.6000	11
7	Accidents risks	0.6571	7	0.3700	15	0.3600	15	0.7125	4	0.4286	15	0.6000	11
8	Site condition inappropriateness	0.6357	9	0.4800	14	0.4600	9	0.7000	6	0.9429	1	0.6000	11
9	Faulty designers and construction	0.6857	2	0.7400	2	0.8200	1	0.8750	3	0.7714	3	0.8000	2
10	Duration	0.6857	2	0.6600	4	0.5600	6	0.8875	2	0.6857	7	0.6333	7
11	Accessibility and evacuation	0.6000	12	0.5500	10	0.4800	8	0.5500	14	0.5429	12	0.6667	5
12	Completion risk	0.6857	2	0.6200	6	0.4400	10	0.5000	15	0.6571	8	0.6333	7
13	Prolonged contractor strikes	0.5643	15	0.5900	8	0.3778	14	0.6250	11	0.7714	3	0.4667	15
14	Inexperienced developers	0.5852	14	0.7400	2	0.7000	2	0.6125	13	0.6000	9	0.7000	3
15	Obsolescence risk	0.5929	13	0.5100	12	0.4400	10	0.7125	4	0.6000	9	0.6667	5

The table 1.8 shows the criticality index rating of various stakeholders for various factors of Economical risk factor category. The highlighted cells shows the top five risk factors based on combined ranking by (Criticality Index Method) CIM.

Table 1.8 Economical Risk Ranking Based On Criticality

ECONOMICAL RISK FACTORS		ENGINEER		DEVELOPER		VALUER		ARCHITECT		TP		ACEDEMICIAN	
		CI	RANK	CI	RANK	CI	RANK	CI	RANK	CI	RANK	CI	RANK
16	Pre investment risk	0.6643	3	0.6600	8	0.4800	8	0.5875	10	0.7714	5	0.5667	13
17	Resettlement & rehabilitation risk	0.6643	3	0.5600	13	0.4800	8	0.6125	8	0.4857	15	0.6000	11
18	Delay in land acquisition risk	0.6500	6	0.6800	7	0.5000	6	0.5500	14	0.8286	1	0.7667	2
19	Cost over run	0.7214	1	0.7300	2	0.5200	4	0.8000	1	0.6857	10	0.7000	4
20	Interest rate	0.6429	7	0.7300	2	0.4600	12	0.7750	2	0.6857	10	0.7333	3
21	Property type	0.5357	14	0.4700	15	0.4400	14	0.6375	6	0.6857	10	0.6000	11

22	Market liquidity	0.6571	5	0.5895	11	0.5400	2	0.5250	15	0.7143	8	0.7000	4
23	Demand and supply	0.6714	2	0.7800	1	0.5200	4	0.5625	12	0.7714	5	0.9000	1
24	Debt risk	0.6286	9	0.7200	4	0.4800	8	0.6375	6	0.5667	14	0.7000	4
25	Brand visibility	0.5259	15	0.7100	5	0.5000	6	0.6000	9	0.7429	7	0.6333	9
26	Capital exposure	0.5429	13	0.7000	6	0.4800	8	0.6875	3	0.8000	2	0.6667	8
27	Lifecycle value	0.6357	8	0.5400	14	0.5400	2	0.6875	3	0.8000	2	0.7000	4
28	Buyers/tenants	0.5857	11	0.5900	10	0.5600	1	0.6625	5	0.6286	13	0.5333	14
29	Investment risk	0.6214	10	0.6500	9	0.4600	12	0.5875	10	0.7143	8	0.6333	9
30	Insurance risk	0.5571	12	0.5800	12	0.4400	14	0.5625	12	0.8000	2	0.5333	14

The table 1.9 shows the criticality index rating of various stakeholders for various factors of Social risk factor category. The highlighted cells shows the top five risk factors based on combined ranking by (Criticality Index Method) CIM.

Table 1.9 Social Risk Ranking Based On Criticality

SOCIAL RISK FACTORS		ENGINEER		DEVELOPER		VALUER		ARCHITECT		TP		ACEDEMICIAN	
		CI	RANK	CI	RANK	CI	RANK	CI	RANK	CI	RANK	CI	RANK
31	Urban planning	0.6714	2	0.5900	4	0.5800	1	0.7500	2	0.8571	1	0.7000	3
32	Regional planning	0.6214	6	0.5400	7	0.5000	3	0.6250	7	0.8286	2	0.6000	6
33	Public intervention	0.6429	3	0.5500	6	0.5200	2	0.6625	5	0.6857	8	0.5667	7
34	Community acceptance	0.6286	5	0.5800	5	0.4400	6	0.6750	4	0.7714	3	0.5333	8
35	Social security	0.5786	8	0.5100	8	0.4200	7	0.6500	6	0.7143	7	0.6333	5
36	Immoral developers	0.6357	4	0.6200	3	0.4667	5	0.5875	8	0.7714	3	0.7333	2
37	Customer relationship management risk	0.6214	6	0.6900	2	0.4200	7	0.7625	1	0.7429	6	0.7667	1
38	Workforce availability	0.6786	1	0.7300	1	0.5000	3	0.7375	3	0.7714	3	0.6667	4

The table 1.10 shows the criticality index rating of various stakeholders for various factors of Legal risk factor category. The highlighted cells shows the top five risk factors based on combined ranking by (Criticality Index Method) CIM.

Table 1.10 Legal Risk Ranking Based On Criticality

LEGAL RISK FACTORS		ENGINEER		DEVELOPER		VALUER		ARCHITECT		TP		ACEDEMICIAN	
		CI	RANK	CI	RANK	CI	RANK	CI	RANK	CI	RANK	CI	RANK
39	Political risks	0.5929	8	0.4900	8	0.6200	2	0.6875	1	0.9143	1	0.7333	1
40	Partnership risks	0.5643	9	0.5400	6	0.5400	6	0.6125	5	0.8000	2	0.6000	5
41	Regulatory risk	0.6148	7	0.5500	5	0.5000	7	0.6750	2	0.7714	3	0.6000	5
42	Permit and approval risk	0.6714	2	0.6400	2	0.6200	2	0.5875	8	0.7429	4	0.6333	4
43	Change in zone risk	0.6714	2	0.6500	1	0.5600	5	0.6125	5	0.6286	7	0.5667	8
44	Laws and regulations	0.6429	5	0.6100	3	0.6600	1	0.6625	3	0.7429	4	0.6667	2
45	Change in building bye laws	0.6929	1	0.5600	4	0.6200	2	0.6375	4	0.6857	6	0.6667	2
46	Change in taxation code	0.6429	5	0.5200	7	0.5000	7	0.6125	5	0.5714	8	0.6000	5
47	Change in accounting rules	0.6714	2	0.4900	8	0.4600	9	0.5500	9	0.5429	9	0.4667	9

The table 1.11 shows the criticality index rating of various stakeholders for various factors of Legal risk factor category. The highlighted cells shows the top five risk factors based on combined ranking by (Criticality Index Method) CIM.

Table 1.11 Strategic Risk Ranking Based On Criticality

	STRATEGIC RISK FACTORS	ENGINEER		DEVELOPER		VALUER		ARCHITECT		TP		ACEDEMICIAN	
		CI	RANK	CI	RANK	CI	RANK	CI	RANK	CI	RANK	CI	RANK
48	Competitions risk	0.7071	1	0.6300	4	0.3400	10	0.6500	6	0.7714	1	0.8000	1
49	Administrative / governance risk	0.6667	3	0.5000	10	0.4000	8	0.6000	8	0.6286	7	0.6000	8
50	Reputation risk	0.6643	4	0.7300	1	0.3800	9	0.6500	6	0.7429	2	0.6333	6
51	Survival in market	0.6143	8	0.6800	2	0.4800	3	0.5625	10	0.6286	7	0.6667	5
52	Innovation	0.5857	9	0.5900	5	0.4200	6	0.7875	1	0.6286	7	0.7000	4
53	Transparency	0.6643	4	0.6400	3	0.4800	3	0.7375	3	0.7429	2	0.8000	1
54	Professionalism	0.6963	2	0.5800	6	0.4200	6	0.7429	2	0.6857	5	0.8000	1
55	Information system for decision making	0.6500	6	0.5300	7	0.4800	3	0.6750	4	0.6286	7	0.5667	9
56	Records	0.6214	7	0.5200	8	0.5200	1	0.6000	8	0.7143	4	0.5333	10
57	Development exposure	0.5857	9	0.5100	9	0.5000	2	0.6625	5	0.6857	5	0.6333	6

The table 1.12 shows the criticality index rating of various stakeholders for various factors of financial risk factor category. The highlighted cells shows the top five risk factors based on combined ranking by (Criticality Index Method) CIM.

Table 1.12 Financial Risk Ranking Based On Criticality

	FINANCIAL RISK FACTORS	ENGINEER		DEVELOPER		VALUER		ARCHITECT		TP		ACEDEMICIAN	
		CI	RANK	CI	RANK	CI	RANK	CI	RANK	CI	RANK	CI	RANK
58	In availability &fluctuation in foreign exchange	0.5704	8	0.3500	8	0.4250	7	0.5000	8	0.6571	5	0.5333	8
59	Delay of payment	0.7407	1	0.6700	2	0.5400	1	0.6000	5	0.7714	2	0.7333	2
60	Inflation risk	0.6643	2	0.7200	1	0.4800	4	0.6375	2	0.8286	1	0.6333	4
61	Local taxes	0.5778	7	0.6200	4	0.4600	6	0.5750	6	0.7429	3	0.5667	6
62	Delay in financial enclosure	0.5929	6	0.6500	3	0.5400	1	0.6750	1	0.7429	3	0.5667	6
63	Lease length	0.6071	5	0.4000	7	0.4800	4	0.5250	7	0.4571	8	0.6000	5
64	Financial strength	0.6538	3	0.6000	5	0.5200	3	0.6125	3	0.6571	5	0.7667	1
65	Bargaining power of developer	0.6429	4	0.6000	5	0.4000	8	0.6125	3	0.6286	7	0.6667	3

The table 1.13 shows the criticality index rating of various stakeholders for various factors of marketing risk factor category. The highlighted cells shows the top five risk factors based on combined ranking by (Criticality Index Method) CIM.

Table 1.13 Marketing Risk Ranking Based On Criticality

	MARKETING RISK FACTORS	ENGINEER		DEVELOPER		VALUER		ARCHITECT		TP		ACEDEMICIAN	
		CI	RANK	CI	RANK	CI	RANK	CI	RANK	CI	RANK	CI	RANK
66	Distribution risk	0.5500	5	0.5000	5	0.4400	5	0.6375	2	0.5667	5	0.6000	5
67	Cash flow risk	0.6714	2	0.7000	2	0.6000	1	0.6375	2	0.6333	2	0.6667	2
68	Efficiency risk of client	0.6286	4	0.6600	3	0.4800	3	0.6500	1	0.6333	2	0.6667	2
69	Labour /market price fluctuation	0.6571	3	0.6600	3	0.4600	4	0.6000	5	0.6333	2	0.6667	2
70	Market downturn	0.6786	1	0.7800	1	0.6000	1	0.6250	4	0.8000	1	0.8000	1

The table 1.14 shows the criticality index rating of various stakeholders for various factors of Natural risk factor category. The highlighted cells shows the top five risk factors based on combined ranking by (Criticality Index Method) CIM.

Table 1.14 Natural Risk Ranking Based On Criticality

NATURAL RISK FACTORS		ENGINEER		DEVELOPER		VALUER		ARCHITECT		TP		ACEDEMICIAN	
		CI	RANK	CI	RANK	CI	RANK	CI	RANK	CI	RANK	CI	RANK
71	Environmental risk	0.6571	1	0.5600	1	0.5000	1	0.6375	2.0000	0.7714	2.0000	0.6333	1
72	Geological conditions	0.6000	2	0.5300	2	0.4200	2	0.6750	1.0000	0.8286	1.0000	0.6333	1

The data thus collected by the responses were giving ranking bt CIM method. Top 15 risk factors of each stakeholder are then obtained and found out. Of all the stakeholders hence 90(6 X15) risk factors are identified. From all 90factors each risk factor is counted and number of the respondents from 6 stakeholders are calculated .(Factor Index Ratio)FIR of each factor is calculated.on basis of the highest FIR the risk factors are identified and suggested as very critical risk factors for the risk management of real estate projects.table 1.15 and 1.16 shows the CI and FIR of the factors.

Table 1.15 CI and FIR of Top 15 Risk Factors of Engineer,Developer and Valuer

SR NO	ENGINEER	CI	NO.OF RESPONSES	FIR	DEVELOPER	CI	NO.OF RESPONSES	FIR	VALUER	CI	NO.OF RESPONSES	FIR
1	Faulty designers and construction	0.6857	6	8.75	Faulty designers and construction	0.74	6	8.11	Incomplete design	0.6889	6	8.71
2	Incomplete design	0.7143	6	8.40	Incomplete design	0.76	6	7.89	Market downturn	0.6	5	8.33
3	Market downturn	0.6786	5	7.37	Market downturn	0.78	5	6.41	Faulty designers and construction	0.82	6	7.32
4	Urban planning	0.6714	4	5.96	Customer relationship management risk	0.69	3	4.35	Urban planning	0.58	4	6.90
5	Demand and supply	0.6714	3	4.47	Capital exposure	0.7	3	4.29	Duration	0.56	3	5.36
6	Workforce availability	0.6786	3	4.42	Cost over run	0.73	3	4.11	Political risks	0.62	3	4.84
7	Duration	0.6857	3	4.38	Interest rate	0.73	3	4.11	Cash flow risk	0.6	2	3.33
8	Professionalism	0.6963	3	4.31	Workforce availability	0.73	3	4.11	Ineffective design updating	0.62	2	3.23
9	Cost over run	0.7214	3	4.16	Demand and supply	0.78	3	3.85	Change in building bye laws	0.62	2	3.23
10	Ineffective design updating	0.6815	2	2.93	Cash flow risk	0.7	2	2.86	Inappropriateness of specification	0.66	2	3.03
11	Change in building bye laws	0.6929	2	2.89	Inflation risk	0.72	2	2.78	Inexperienced developers	0.7	2	2.86
12	Competitions risk	0.7071	2	2.83	Inexperienced developers	0.74	2	2.70	Checklist & methodology	0.56	1	1.79

									risks			
13	Delay of payment	0.7407	2	2.70	Brand visibility	0.71	1	1.41	Buyers/tenants	0.56	1	1.79
14	Information and communication	0.6786	1	1.47	Debt risk	0.72	1	1.39	Permit and approval risk	0.62	1	1.61
15	Completion risk	0.6857	1	1.46	Reputation risk	0.73	1	1.37	Laws and regulations	0.66	1	1.52

Table 1.16 CI and FIR of Top 15 Risk Factors of Architect, Town planner and Academician

SR NO	ARCHITECT	CI	NO.OF RESPONSES	FIR	TP	CI	NO.OF RESPONSES	FIR	ACADEMICIANS	CI	NO.OF RESPONSES	FIR
1	Faulty designers and construction	0.875	6	6.86	Faulty designers and construction	0.7714	6	7.78	Faulty designers and construction	0.8	6	7.50
2	Incomplete design	0.925	6	6.49	Incomplete design	0.8	6	7.50	Incomplete design	0.8333	6	7.20
3	Urban planning	0.75	4	5.33	Market downturn	0.8	5	6.25	Market downturn	0.8	5	6.25
4	Capital exposure	0.6875	3	4.36	Urban planning	0.8571	4	4.67	Interest rate	0.7333	3	4.09
5	Workforce availability	0.7375	3	4.07	Capital exposure	0.8	3	3.75	Political risks	0.7333	3	4.09
6	Professionalism	0.7429	3	4.04	Political risks	0.9143	3	3.28	Customer relationship management risk	0.7667	3	3.91
7	Customer relationship management risk	0.7625	3	3.93	Delay in land acquisition risk	0.8286	2	2.41	Professionalism	0.8	3	3.75
8	Interest rate	0.775	3	3.87	Inflation risk	0.8286	2	2.41	Demand and supply	0.9	3	3.33
9	Cost over run	0.8	3	3.75	Site condition inappropriateness	0.9429	2	2.12	Inappropriateness of specification	0.7	2	2.86
10	Duration	0.8875	3	3.38	Uncertainty of material unavailability	0.7714	1	1.30	Delay of payment	0.7333	2	2.73
11	Site condition inappropriateness	0.7	2	2.86	Lifecycle value	0.8	1	1.25	Delay in land acquisition risk	0.7667	2	2.61
12	Transparency	0.7375	2	2.71	Insurance risk	0.8	1	1.25	Competitions risk	0.8	2	2.50
13	Accidents risks	0.7125	1	1.40	Partnership risks	0.8	1	1.25	Transparency	0.8	2	2.50
14	Obsolescence risk	0.7125	1	1.40	Regional planning	0.8286	1	1.21	Immoral developers	0.7333	1	1.36
15	Innovation	0.7875	1	1.27	Geological conditions	0.8286	1	1.21	Financial strength	0.7667	1	1.30

6. RESULT AND DISCUSSION:

Risk management does not eliminate the risks involved in the real estate sector entirely. It is an approach to manage different risk categories and risk factors in a city like Ahmedabad which in no time will be a metro city. Ahmedabad is a city where there is something for everyone. In fact it is a city which offers 2BKH flats for 25 lacs within city premises. Increased migration of people and urbanization calls for risk management. The real estate sector in India has been becoming more organized, this is because of the entry of international real estate players, foreign investors and Indian corporate houses, so the real estate sector is

facing a challenge to meet the rising demands for the world class infrastructure in cities, housing across different income level and create sustainable cities for future generation. The risk factors with higher FIR from overall combined ranking after considering top 15 factors from each category of the stakeholder are found which are considered to be most critical factors affecting risk management in the real estate projects. The risk factors in the decreasing order of the factor index ratio are Faulty designers and construction, Incomplete design, Market downturn, Urban planning, Duration, Political risks, Demand and supply, Workforce availability, Capital exposure, Customer relationship management risk, Professionalism, Cost overrun, Interest rate, Cash flow risk and Ineffective design updating. Hence forth a collaborative team should be formed wherein real estate project companies can interact with government, insurance companies and research and development sector including universities and colleges covering all the critical risk factors as found in the research.

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