

Identifying the Constraints for the Approval of High Rise Buildings in Pune

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Abstract- In this research work the constraints in the approval process of building permission were identified by taking 35 personal interviews. The questions were particularly related to finance, design, politics, experience, technology, feedback system, building codes. From this 10 major constraints were identified, namely 1) Poor Feedback Systems, 2) Technological Constraint, 3) Lack of Building codes and standards establishing, 4) Lack of Experience and Expertise, 5) Natural constraint, 6) Design Constraint, 7) Lack of Coordination Between the Land Agencies and the Local Authorities, 8) Inadequate Number of Staff for Field Inspection and Monitoring, 9) Political Constraints and 10) Financial Constraint. After finding all the constraints they were ranked by the Relative Importance Index (RII) method and some suggestions were given to avoid the delay of building approval process.

Keywords – Constraints, Building, Approval Process, RII method, Suggestions

1.0 Introduction- India is highly populated country, according to Government of India the current population is 1,393,420 and the area of country is 3,287,590 sq.km. This makes land resources extremely valuable. Now a days migration of people from villages to cities increased for the survival or education purpose due to which population in cities is increases. In such case to construct high rise buildings is the suitable option as it provide work and space to man. High rise buildings are the tall structures. In India buildings height more than 75ft or 23m is known as high rise building. High rise buildings are becomes more popular due to invention of elevator as it becomes easy for the mobility of the people. As reinforced concrete and steel frame are the materials used for construction of elevator. For the American style skyscraper steel frames are used and for residential block tower concrete is used.

In urban areas the land prices are increased due to population density, due to which demand of vertically buildings rather than horizontally buildings is increased. There is not only reason for the increased demand of high rise buildings, there are some other reasons like they are located in the city, also offers best views, they have elevators for the mobility, they have security, they provide parking and these are the reasons they attract the purchaser and also increases the demand of high rise construction. Though the procedure for construction of high rise buildings is not easy it goes through many procedures which started from approvals and sanctioning of high rise building project. Building approval procedure is different with different area and zone. As building rules and regulations may vary by zone.

While completing sanctioning and getting approval there are some constraints due to each the whole process becomes time consuming and which delay further construction activities. Constraint is nothing but the weakest link or bottleneck in the system which create obstacle in a system. There are various types of constraints, Legal constraints which mainly consist of work flow, safety regulation, and supervision plan, Economic constraints consist of budget of project, Environmental constraint involved environment related factors like air protection, tree preservation, traffic limit, noise limit etc , Technical constraints consist electrical wiring, ventilation, ductwork, fire services etc and Social constraints which is related to human tendency to perform a work, emotional constraint, ownership criteria etc. These types of constraints are appeared in the system due to Bad multitasking in which so many things are handled at the same time, Student syndrome due to which all the work is completed just before the urgency and Parkinson's Law due to which the work expands so as to fill the time available for it's completion. To remove these constraints theory of constraint is used in which constraint in the system is removed by following five steps of theory of constraints.

1. Identify the constraint in the system- To find the weakest link in the system
2. Exploit the constraint in the system- To find quick solution with present resources
3. Subordinate the constraint- to make sure all the activities are not getting disturbed
4. Elevate the constraint- If constraint remain in the system then think about other solution
5. Repeat the process- Repeat the procedure.

2.0 Literature Review- From the previous literature the concept of theory of constraints was studied to apply it for the approval building process

There are five steps of Theory of Constraints as follows:

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Factors which affect the Urban Land Use Plans are identified. They are mostly related to

1. Political institutional factor- It include influence of the person with political or economical interest.
2. Attribute of the plan- It include planning technique, planning goal, quality of plan
3. Urban system factor- It include Economy growth, increasing Population, life style of people[4]

Following are the risks faced by Singapore firms-

1. Political and social risks

2. Economic and financial risks
3. Cultural risk
4. Design risks
5. Managerial risks[5]

There are five types of constraints Legal constraints, Economic Constraints, Environmental Constraints, Technical constraints and social Constraints[2]

3.0 Methodology

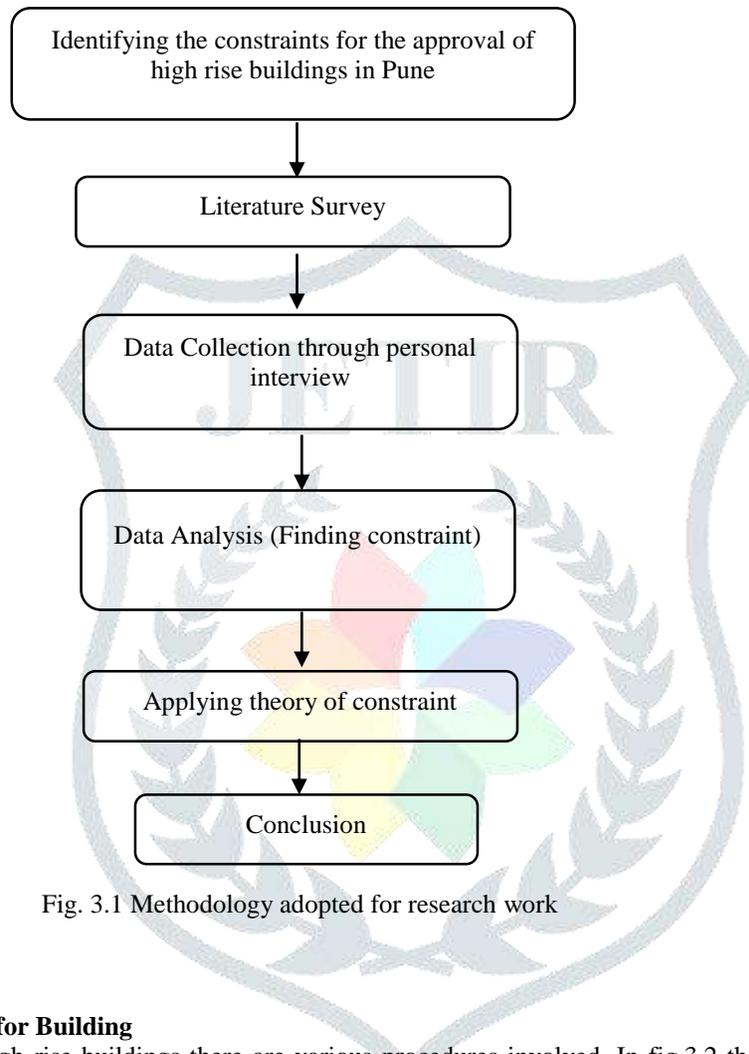


Fig. 3.1 Methodology adopted for research work

3.2 Approval Procedure for Building

For the construction of high rise buildings there are various procedures involved. In fig.3.2 the whole procedure for building permission is given. The architect or an applicant gives the application which is contained in the APENDIX A-1 Which is needed for the construction purpose. So from that the supporting documents are checked which consist in the checklist and which even consist of mandatory and optional documents. So when the mandatory documents are attached the application is registered, and further scrutiny is done before the payment. The scrutiny level is divided into two levels one level is done by assistant town planner and the second level of scrutiny is done by the chief council/ Chief officer/ municipal council so these are the stages A,B and C.

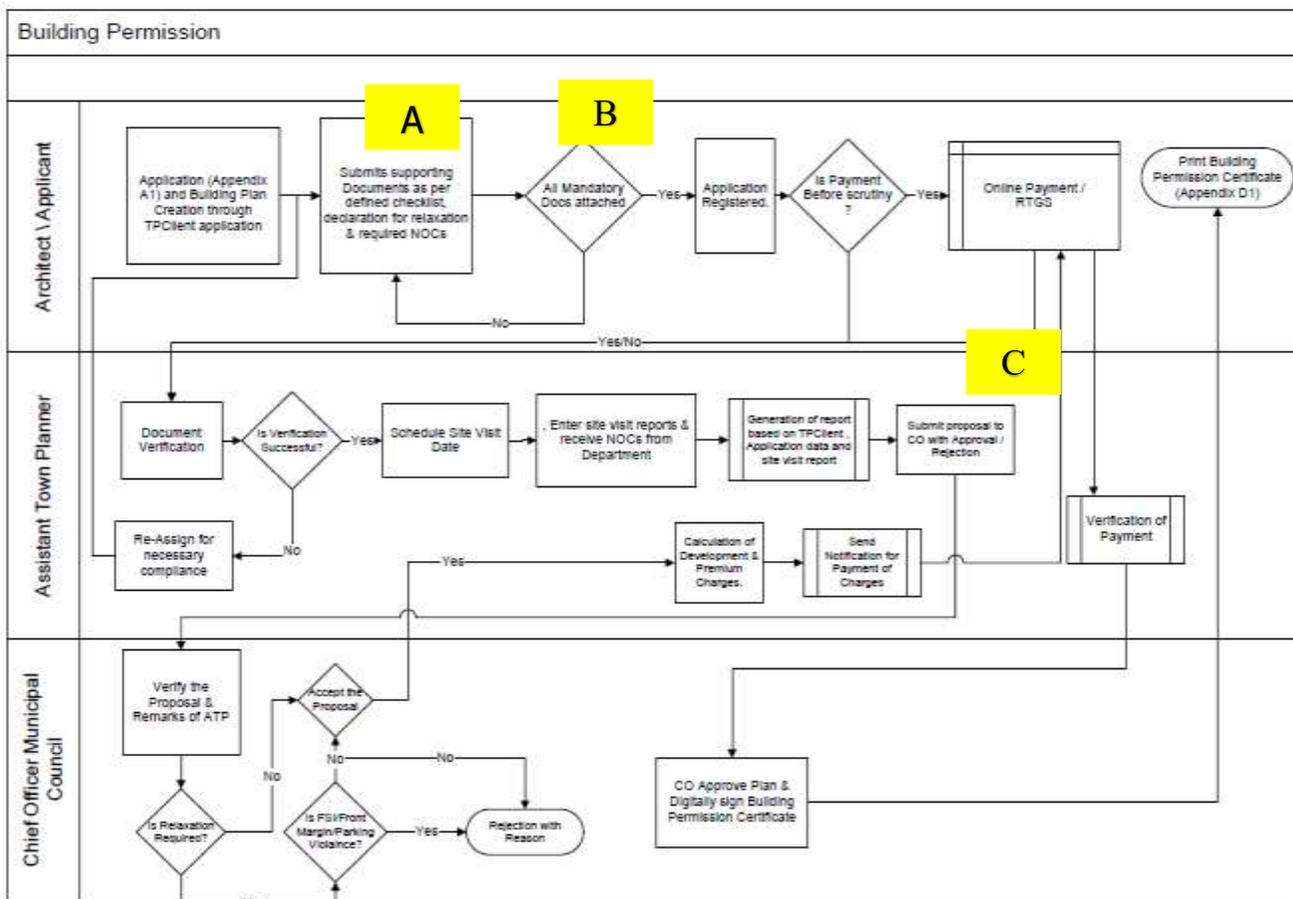


Fig. 3.2 Approval Procedure for building

When architect or the applicant fills the application form which is contained in the APENDIX-A1 This is known as stage A there is an application notice which is needed for the development of the erection work. So whenever you want to carry out the demolishing on the alteration in any place of the building, you have to fill the application form which is contained in the in the appendix A1. It has to be given in the writing through a registered architect or the engineer or the supervisor. It shall be submitted through a licensed authority as it is in the prescribed form. Along with the documents the plans and the statements has to be attached which shall be submitted to the municipal commissioner and this is the APENDIX-A1

After filling the form further you have to submit the supporting documents as per the defined checklist the declarations for the relaxation and the required analysis so this is the checklist, it consist of both the documents that is the mandatory and optional documents. Following is the checklist for stage B which consist of XML and TP file, these two files consist of the drawings of the building and drawing of the buildings are nothing but the AutoCAD drawings which will be when uploaded. The drawing is traced in the system and registered and then it will be converted into XML file and the TP file. It is converted into format, as it is necessary for the application. Next is original sales deed in this attested copy of original sales deed or the least deed has to be attached along with the form and even a copy of power of attorney wherever necessary has to be attached along with documents with application. Next document is 7/12 extract or the property registered card of date not more than six months before the date of the submission has to be attached. The tax receipt or the assessment copy of the current year is mandatory document. Next one is certified copy of the approved subdivision and the amalgamation layout of the plan from the concerned authority has to be attached. So the certified copy of the measurement plan of the plot or layout of the plot under development proposal the statement of the area of the holding by the triangulation method from the licensed architect or licensed authority has to be attached. These are the documents required for stage B.

After the documentation mentioned in stage B the application is registered and the scrutiny is done by the assistant town planner, as he does the document verification and when the documents are successfully verified he decides the site visit date and he himself or the engineer goes to the site visit and he generate the site visit report based on the questionnaire drafted on the site itself and they are marked over there and further he generates the report based on the TP client. Following is the site visit checklist for building permission. It consist of scrutiny questions based on the site, whether you have location as per approved layout of town and country planning department or not and if there is any remark then they plotted it on remark column. Then ownership of approach road whether it is public road or the private road or are there any trees on site if yes or no. Even if the trees are going to

be demolished or not, whether proper sanitation is provided on site and is the site is within the vicinity of the structure identified by the archeological department or not. These are the questions are verified on the site itself. Drawing on the paper and on the ground is crosschecked by the assistant town planner.

3.3 Following is the information contained in the notice

1) Ownership, title and area- in this you should have 7/12 extract, the measurement plan, the statement of the area and third party interest if any created by the agreement of the sale has to be attested and attached along with the form and if the land is leased by the government or any other local authority, then the attested copy of that has to be attached.

2) Plans to be Submitted- in this the key plan or the location plan should be drawn not to a scale more than 1:10,000 it represent the location and the key plan which has to be submitted with the building permission. Next is site plan, it is based on measurement plan and it is drawn to a scale not more than 1:500 and when the area is more than four hector then drawing should be done to a scale not more than 1:1000. Layout plan is based on the development of land so in the layout plan the drawing has to be done to a scale not less than 1:500. Amalgamation plan consist of when two or more plots are to be combined so instead of giving separate drawing so the plans are to be amalgamated so all the layout of that has to be submitted along with the application. Next is a service plan, in this the drawing can be done not to a scale less 1:100. This consist of plan elevation and the sections of the water supply and sewer disposal. Next is a building plan, it consist of the drawing to a scale not less than 1:100. It consist of all the floor plans, carpet area, built-up area etc.

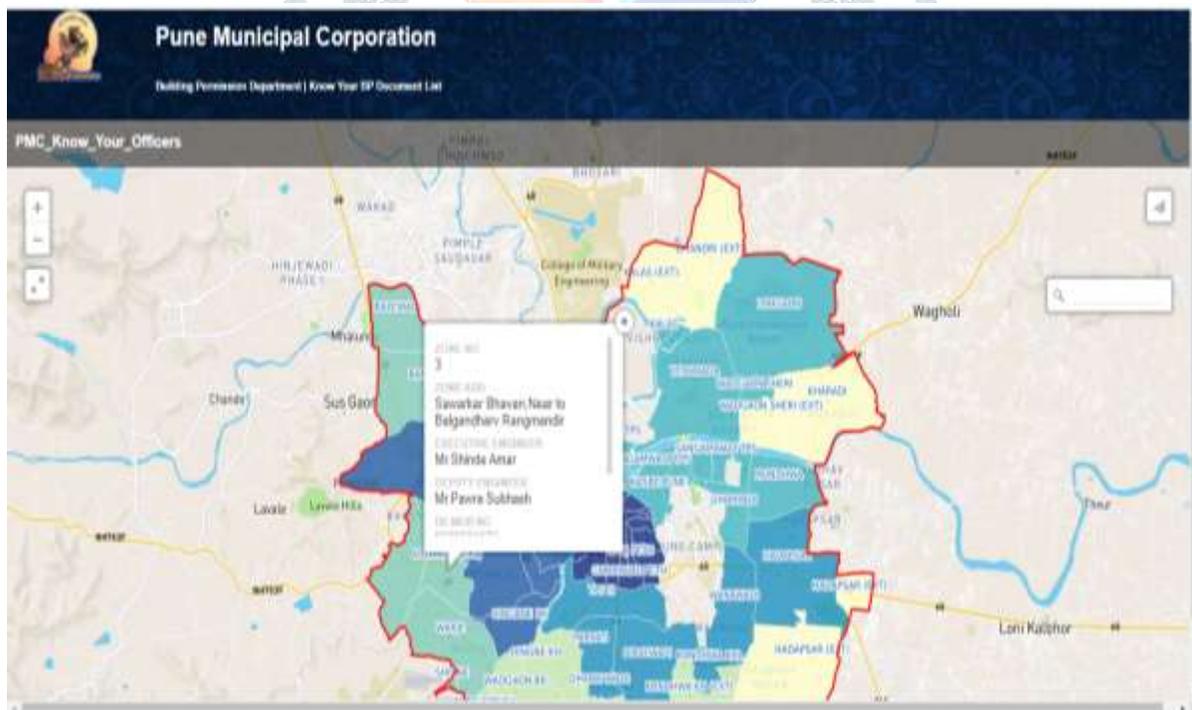
3) Fees and Charges- The building and scrutiny fees is the payment of tax receipt or receipt of the payment has to be submitted along with the application along with the documents so payment has to be paid as per the prescribed by the commissioner. Next is security or the deposit fee development charges. This fees is also recommended as per the instructions given by the commissioner and remaining are the premium charges and the tax clearance.

4) Clearance from Other Department- Clearance from any the authority like civil aviation, Railways, smoke nuisance, defense department, archeological and Inspectorate of boilers clearance certificate from these department has to be attached with building permission document

5) Supervision- Supervision done by the architect or the supervisor or the structural engineer and a certificate has to be attached along with the documents

3.4 Document requirement as per the area

This work consist of Pune region, and Pune mainly consist of two municipal corporation PMC and PCMC. So to find out what documents are needed for the particular area in Pune, you can simply go to Website of PMC or PCMC, select the area for constructing building and the list of documents shows there which are required for the building permission. In Snapshot it shows the required documents after clicking particular area.



Snapshot 3.1. PMC website

3.5 Survey

In order to find out the severity of Government approval process of high rise building a survey was conducted. In which respondents have to rate from 1 to 5 like how sever the approval procedure is. 1 represent none, 2 represents Low severity, 3 represent moderate severity, 4 represents high severity and 5 represents very high severity. As the survey consist of 35 high rise sites and the results are summarized as given in fig.

From the fig. it shows that 35% respondents says that the severity of government approval process is high and 20% says that it is very high. 17% respondents says that it is moderate, 25% says it is low and 3% says nothing on it.

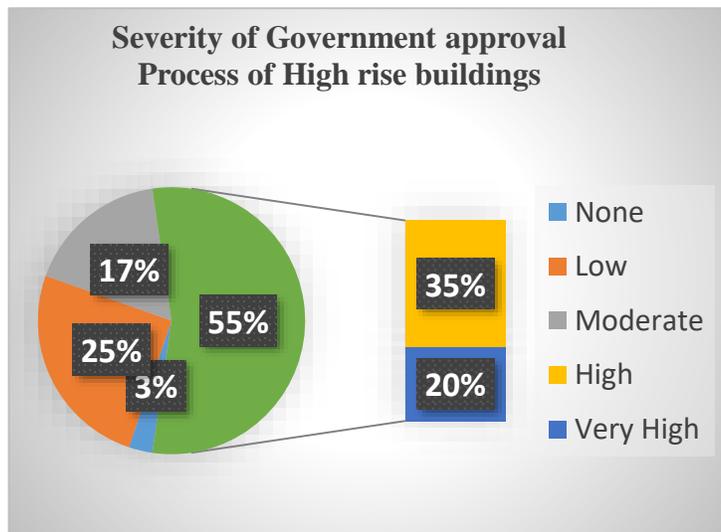


Fig. 3.4 Severity Analysis

Another factor which respondent have to respond is delay in high rise building due to Government approval requirement. The results are summarized below:

From the fig. it shows that 26% respondents says that the delay due to government approval process is high and 9% says that it is very high. 31% respondents says that it is moderate, 34% says it is low and 0% says nothing on it. As total 35% respondents says that government approval process causes delay in the launching of construction of building.

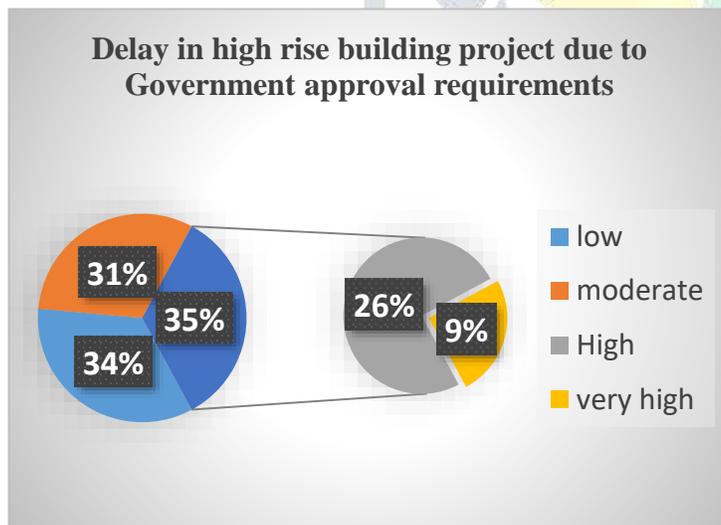


Fig. 3.5 Delay due to building approval process

3.5 Personal Interviews

After taking 35 the interviews, all the data was summarized in order to find out the specific constraints which makes the approval process delay or standing in a way of completion of approval process for high rise buildings in Pune. The constraints are Design Constraint, Financial Constraint, Lack of Coordination Between the Land Agencies and the Local Authorities, Inadequate Number of Staff for Field Inspection and Monitoring, Lack of Experience and Expertise, Technological Constraint, Lack of Building codes and standards, Natural constraint, Poor Feedback Systems and Political and Social Constraints. They are explained as below:

1. Design Constraint- It consist of design and planning of project. All the designs should be within the given scale and requirement of building. For high rise building safety building code should be followed in order to make perfect structural design. It include site plan, key plan, Layout plan etc.

2. Financial Constraint- It consist of interest rates, credit ratings, capital supply, cash flows and rentals. As for the approval procedure of high rise building it consist of charges and fees of building/scrutiny fee, deposit fee charges, premium charges and tax clearance. If there is delay in providing this charges and fees then it automatically delay approval process.

3. Lack of Coordination between the Land Agencies and the Local Authorities- As there a various land agencies which handles all the land related processes like selling, purchasing and leasing of land. In order to get land clearance land agencies should have good communication with local authorities as all the process is conducted under local authority.

4. Inadequate Number of Staff for Field Inspection and Monitoring- For the site visit which is the stage C of building approval process adequate staff should be there to inspect and monitor all the activities.

5. Lack of Experience and Expertise- Lack of experience and expertise has been a vital challenge throughout the entire life cycle of high-rise buildings. Providing comprehensive training for labor, the undeveloped construction method is unable to reach its full potential, in terms of improved quality, reduced construction time, decreased material waste, and enhanced sustainability.

6. Technological Constraint- Various technologies are used for surveying as it makes easier to the surveyor also use of advanced technology can save time and money to make process fast.

7. Lack of Building codes and standards- Building codes and standards are the cornerstones that specify corresponding requirements involving structure, architecture, services, durability, safety, and sustainability, for design and construction of buildings. All the plans of buildings should be based on Is code criteria.

8. Natural constraint- A major construction risk is bad weather and unknown soil conditions. The monsoon season in India brings heavy rainfall which affects construction progress. This can lead the delay to site visit which is important process of building approval system.

9. Poor Feedback Systems- Once the documents along with all the charges and fees submitted, applicant has to wait near about 30days. After that period applicant come to know whether the application is accepted or rejected. This leads to delay in further processes.

10. Political and Social Constraints- According to the experts India is a relatively risky place to conduct business. Business practices and laws may not always be in accordance with established international standards. Elections are held once every four years and the political situation is turbulent. A large number of political parties compete for the places at the national and state levels[4].

3.6 Ranking of Constraints

After finding all the constraints, they are ranked from 1 to 10. To find out there ranking RII method is used. Questionnaire were circulated through online mode. In survey all constraints have to rate from likert scale 1to 5. 1 as “very high”, 2 as “high”, 3 as “moderate”, 4 as “low” and 5 as a “very low”. From 25 sites only 11 responses were collected and there results are calculated as below

Relative Importance Index (RII) method is used to determine the quality of factors involved. The RII is calculated by the following formula

$$RII(\%) = \sum a * \frac{n}{N} * \frac{100}{5}$$

Where, RII = Relative Important Index

a= Constant expression weight

n= frequency of response

Sr. no	Constraint	RII	Order
1.	Poor Feedback Systems	65.45	1
2.	<ul style="list-style-type: none"> • Technological Constraint- • Lack of Building codes and standards establishing 	61.81	2
3.	Lack of Experience and Expertise	58.18	3
4.	Natural constraint	56.36	4

5	Design Constraint	52.71	5	N= total
6.	Lack of Coordination Between the Land Agencies and the Local Authorities	50.90	6	
7	Inadequate Number of Staff for Field Inspection and Monitoring	49.09	7	
8.	Political Constraints	45.45	8	
9.	Financial Constraint	41.81	9	

number of response

Table 3.3 RII Results

4.0 Results and Discussion

4.1 Recommendations

1. **Design Constraint-** Designs should be ready before the time frame so as to revise and check all the small things by expert which will not affect the further process.
2. **Financial Constraint-** Financial resources to develop the agencies capacity by introducing modern technologies, do field inspection and monitoring, purchase logistics
3. **Lack of Coordination between the Land Agencies and the Local Authorities-** to ensure the quality and safety several agencies are involved so to avoid miscommunication between then appointing third party which will monitor all the agencies.
4. **Inadequate Number of Staff for Field Inspection and Monitoring-** number of staff should be decided as per the area
5. **Lack of Experience and Expertise-** Appoint experienced person or provide training to existing one
6. **Technological Constraint-** Effective and efficient use of information technology can reduce the regulatory time and cost of the construction
7. **Lack of Building codes and standards-**establishing a series of codes and standards for an innovative construction method requires the accumulation of tests and practices which results in “unable to freeze design early” to avoid this test and practices should be done early to avoid delay
8. **Natural constraint-** in case of heavy raining taking multiple borehole test or adding cause in contract that “ additional cost will be given by owner” in case of natural risk
9. **Poor Feedback Systems-** “Where a person submits an application for a building permit the District Planning Authority shall notify him within seven days of the receipt of the application
10. **Political Constraints-** projects affect by changing rules which were made to increase the ruling party’s popularity. To avoid political constraint a structured political risk analysis approach that identifies the primary sources of political constraint and their resultant impacts on project cash flow and probable cost. Or the response to political constraint would be to cooperate and maintain good relationships with the local government.

4.2 Ranking of constraints by using RII method:

By using RII method the first constraint which highly affect the building approval process is poor feedback system with RII (%) 65.45 and hence ranked at number 1. After that Technological Constraint and Lack of Building codes and standards establishing has RII (%) 61.81 and acquired rank 2 at the same place. Lack of Experience and Expertise has RII (%) 58.18 and hence ranked at 3rd. Natural constraint has RII (%) 56.36 and at 4th position. Next is Design Constraint having 52.71 RII (%) and at 5th position. After that Lack of Coordination between the Land Agencies and the Local Authorities is at 6th by having 50.90 RII (%). The next is Inadequate Number of Staff for Field Inspection and Monitoring having RII (%) and at 7th position. Then Political Constraints is at 8th place with RII (%) 45.45 and the last one is financial constraint having 41.81 RII (%) the least RII and hence listed or ranked at last.

5.0 Conclusion

1. This seminar work reveals the top 10 constraints in the approval process of high rise building in Pune are Design Constraint, Financial Constraint, Lack of Coordination between the Land Agencies and the Local Authorities, Inadequate Number of Staff for Field Inspection and Monitoring, Lack of Experience and Expertise, Technological Constraint, Lack of Building codes and standards, Natural constraint, Poor Feedback Systems and Political Constraints.
2. Identification of these major constraints in the approval process will help to reduce unnecessary loss of time, cost and resources.
3. Ranking of these constraints will help the professionals to give required weighted to respective constraints
4. The recommendations will help the construction professionals to curtail the losses by delay in building approval procedure of high rise buildings.

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