

An Analytical Approach for Evaluation of Construction Project Failures

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Abstract: Construction project plays a major role in the economic development of the nation and its failure may bring several impacts on the environment and the real properties. Generally failure occurs due to technical and non-technical issues and lack of management skills. This paper aims to find out the major factors that are leading to construction failures like financial, Geotechnical, environmental. Some of the failures observed in Kakinada, East Godavari district. Keeping these in view ShyamalaSadan complex has been selected, which was located near the seashore as a case study, this study was conducted to analyze the failure chances at that particular area by creating buffer zone up to 5km and creating thematic maps like Groundwater potential maps, Geomorphology, land cover, land use. And by integrating these thematic data and questionnaire survey reasons for failures have been identified and solutions are given to mitigate those failures.

Applications: These suggestions can be applicable for all type of projects globally.

Keywords: Remote sensing (RS) and Geographic information system (GIS), thematic layers.

I. INTRODUCTION

Construction project failure may bring several effects to human being, loss of organization reputation, financial problems etc. Special caring should be taken to reduce the rate of construction project failures. Proper inspection of a project can help us to identify the problems in early stages. Project failure is not only the collapse of a structure but also the projects which are not completed within mentioned time and budget. The organizations like occupational safety and health administration (OSHA) are committed to reduce the construction project failures. OSHA preserves data after the occurrence of a project failures and accidents. OSHA results helps us during the project failure investigation only. [1] siddiquimohammad was concluded that usage of poor quality materials is the main issue for the building failure. [2] sk.azeezahamed concluded that 25% of building failures occur due to technical issues like poor design capacity, lack of experience in complex projects and frequent design changes are the main factors which are leading to construction failure. [3] Akash saxena (22 August 2016) identified the factors behind the project failure and they find out the essential techniques and tools in order to achieve a successful project. [4] Janet.k, E.Lockley determines the most frequent causes of failures in construction and they discuss about the factors that can learn by OSHA regulations.

Remote sensing: Remote sensing is the process of acquiring data by without touching or without having physical interaction with the object and get the information by capturing the reflected energy.

Geographic information system: GIS is a computer based information system used for the purpose like decision making in planning and management of land us, natural resources, transportation and environmental factors.

II. RESEARCH SIGNIFICANCE

The main aim of this paper is to identify the causes of a construction project failure, analyze the effects and impacts of a failure. determine the alternatives and solution to the problem of construction project failure

III. DESCRIPTION OF WORK

A. Description of study area

In this research I have taken Kakinada town, East Godavari district Andhra Pradesh. Kakinada Municipal Corporation and urban area is spread over 161.23km² and 40.36 km² respectively. As per the 2001 census the growth rate of Kakinada is 4.45 lakhs. Mangrove forest is located 20 km from the Kakinada town and it is spread over 235 km². Figure1 and figure 2 shows that the total methodology of the project and classification of failures respectively.

Methodology:

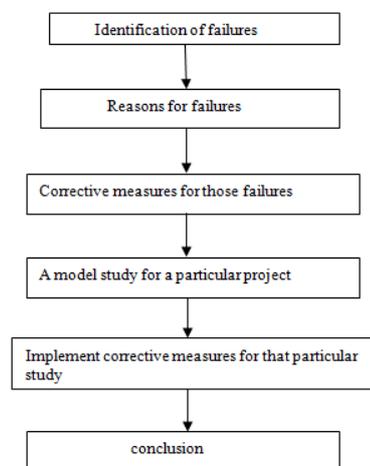


Figure 1: explains about the methodology followed for this paper

Revised Manuscript Received on April 15, 2019.

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Identification of failures:

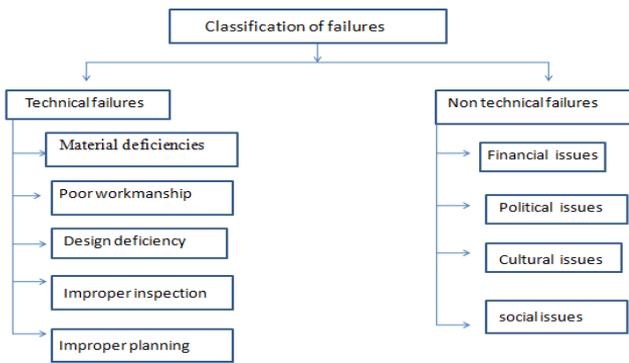


Figure2: (Explains about the classification of failures)

A. Technical failures:

Material deficiency:

Material deficiency divides into 2 types i.e. poor quality materials and unavailability of materials as per the schedule. Using poor quality materials may lead to collapse of a structure and unavailability of materials may lead to changes in schedule.

Poor workmanship:

Workmanship is a manual aspect of skill. Train the employees as per the needs and trends for successful project. The poor workmanship reflects on the performance of a project.

Design deficiency:

The designers should think carefully with full concentration and considerations towards their project. Faults in building design causes heavy impact on building for rest of its life and there is no compensation for it.

Improper inspection:

Inspection is an essential part for any construction. Proper inspection of a project can help us to identify the problems in early stages which may increase the success rate of a project.

Improper planning:

A successful project needs proper planning of activities and the project members must know the clear picture of day to day work and project goals

B. Non technical failure:

Financial issues:

Financial issues may be caused due to insufficient cash flow, financial market instability and financial difficulties of owner. Financial issues may lead to project failure.

Political issues:

political uncertainties may affect the construction industry.

Cultural issues: ignoring of cultural differences can lead to project failure.

Social issues: social issues include strikes, festivals which may lead to delay in construction.

Reasons for failures:

1. Lack of project management.
2. Financial difficulties of owner.
3. Poor design capacity and frequent design changes.
4. Inaccurate cost and time estimation.
5. Lack of clarity in project scope.

6. Lack of capable project owners.
7. Unsuitable construction methods.
8. Inadequate legal framework
9. Unskilled labor.

Measures for reducing construction project failures:

1. Clear identification of goals,
2. Full time inspection by the supervisors.
3. Built team goals
4. Smart decision making
5. Minimize the project failure by reducing continuous and dramatic changes.
6. Train the employees as per the needs and trends.
7. Safety measurement should be taken.
8. Having the right team of qualified engineers is the key to success.

Data collection:

This paper mainly discusses about the factors that are leading to failure of a project, and analyses the failure by considering a case study of Shyamala Sadan complex (shown in figure 3) which was sinking up to its ground floor near Kakinada town east Godavari district.



Figure3: Syamala Sadan complex (G+4)

A structured questionnaire survey was conducted and given the rating to the factors which leads to failure of Shyamala Sadan complex.

Table 1: (rating to the failures)

S.no	particulars	Rating
1.	Faulty design	5
2.	Improper inspection	4
3.	Material deficiency	4
4.	Environmental issues	3
5.	Poor site selection	3
6.	Geo technical issues	5
7.	Financial issues	5
8.	Social issues	3
9.	Political issues	4
10.	Cultural issues	2



IV. ANALYSIS OF DATA AND RESULT:

In this study the failure of shyamalasadan complex was analyzed by creating buffer zone up to 5km as shown in figure 4 using remote sensing and geographic information system

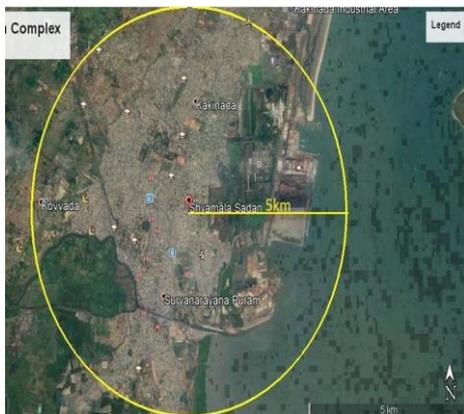


Figure4: (shows buffer zone)

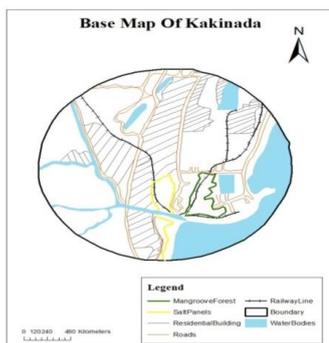


Figure5: (Land use land cover)

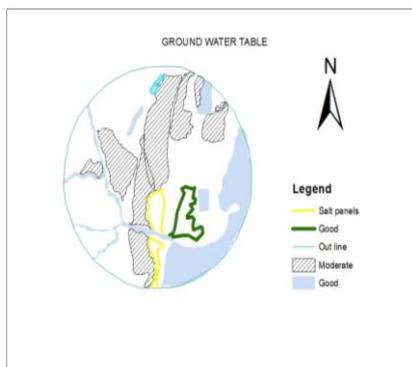


Figure6: (Ground water table)

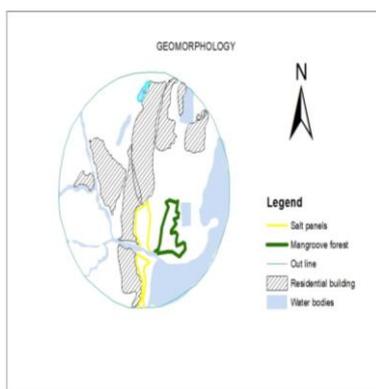


Figure7: (geo morphology)

V. CONCLUSION:

The main reason for sinking of shyamalasadan complex is due to subsidence of land and deforestation of mangrove. Land subsidence may occur due to the extraction of oil and gas from the reservoir rock which leads to exploitation. Due to this exploitation 100km land was effected. As shyamalasadan complex was located 4km from the seashore. In this survey we observed that shyamalasadan complex was constructed without conducting proper geotechnical tests. The failure of shyamalasadan complex gives the importance of geological tests. The role of geological study should not be ignored before commencement of construction projects.

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