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Understanding the dynamics of setting up of infrastructural projects in Kerala

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ABSTRACT

In a country's economic growth infrastructure plays a vital role. The social and political dynamics increasingly determines the fate of infrastructural development all over the world. It is a known fact that projects with robust technical designs and planning still face oppositions and results in time and cost overrun. This schedule and cost overrun not only results in uncertainty but also results in the compromise on quality too. It seems only less number of studies had been conducted for identifying the social and political dynamics against infrastructural projects. Studies that are more scientific are required to be conducted in this aspect. Twelve cases from Kerala were taken for study. The selected ones include various types of infrastructural projects such as road developments, airports, sea ports, metro rail, road tunnelling. In addition, the case studies are currently holding different status completed, under progress, dropped. The selected cases are the recent and trending infrastructural projects in Kerala.

Index terms: New technologies, Difficulties in adoption, Survey

INTRODUCTION

Now a day the social dynamics determines the fate of infrastructural projects over engineering aspects and technical features of the project. The social dynamics, public opposition, technical characteristics and their faults related with the project planning may affect the expected outcome of the project. So in general the symbiotic interplay between these two elements only give better understanding of facts of emergent dynamics in the context of large scale infrastructural project [1]. Identifying the risk chances present there can help to plan the work in a way that the cost overrun and time overrun will be affordable.

Existing sustainability studies largely concentrates on technical aspects, environmental factors, and economic aspects. Social opposition against infrastructure projects can be due to various factors such as traditional actors, vulnerable groups, political parties, religious

groups etc. and their actions. In addition, the sustainability of the project is always challenged by emerging risks associated with the involvement of institutionally diverse actors [2]. Qualitative studies and qualitative comparative analysis, which includes empirical research, case studies, and analysis can be illuminate the trend behind the social and political dynamics of large scale infrastructure projects [3].

On one hand, the dynamic related to public opinion and their attitude towards the project may result in public opposition risk [4] this impact is usually highlighted for capital intensive projects [5] on the other hand, project characteristics of ecological and social systems [6].

In this work, for the purpose of understanding the dynamics of people in Kerala against the setting up of infrastructural projects, twelve recent and trending case studies had selected which includes infrastructures such as road

developments, airport, seaports, metro rail, road tunnelling etc. in which some are completed, some are under progress and some had dropped [7-10].

This study aims to identify the influence of social dynamics in infrastructural project and to list out the general factors which delay the project. Secondary data about the project was collected from various sources and primary data through site visits and unstructured interviews. The data collection gauged the public opinion regarding the setting up of 12 various infrastructure projects. Qualitative Comparative Analysis (QCA), a qualitative data analysis technique is employed for analysing the data and drawing out the conclusions [11-15].

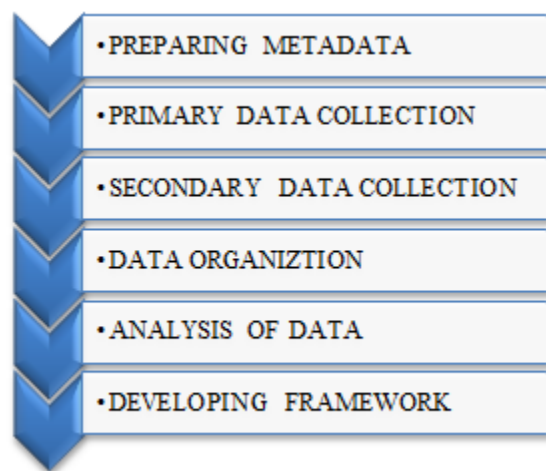
The results of this research highlight the social system in setting up of infrastructural projects in Kerala. Public opinion and social dynamics need to be treated with at most care while planning an infrastructural project in Kerala. This study attempts to provide a better understanding about the public opinion and social dynamics. Along with identifying the factors that can adversely affect projects, the corresponding coping mechanisms are also identified [16-20].

AIMS AND OBJECTIVES

The main aim of this project is to understand the dynamics of people against the setting up of infrastructural projects in Kerala. Also, the various critical factors that can lead to people's opposition are studied. Once these factors are identified, a framework is formed so as to find suitable solutions for these problems thereby resulting in the successful completion of the project.

METHODOLOGY

The methodology selected for this project is Qualitative Data Analysis (QDA). Also, Qualitative Competitive Analysis (QCA) is adopted for developing the framework. Therefore the meaningful and symbolic content of the qualitative data is checked using QCA. At the same time this helps to convert the complex data into a simple and shorter format in a systematic manner. The first step in the Qualitative Data Analysis is the collection of the metadata [21-25].



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SELECTION OF CASE PROJECTS

In this work, for the purpose of understanding the dynamics of people, twelve case studies had selected, the selected ones include various types of infrastructural project, such as road developments, airports, seaports, metro rail, road tunnelling, etc. In addition, the selected case

studies are currently holding deferent status, completed, under progress, and dropped. All the selected cases are the recent and trending infrastructural projects in Kerala. The twelve cases studied for this project work are listed below [26-30].

1. GAIL – Kochi Kootanad Mangalore Bangalore pipeline.

2. Tunneling at Kuthiran
3. Vizhinjam International Deep Water Multipurpose Port.
4. Aranmula International Airport.
5. Kochi Metro Rail.
6. Kannur International Airport.
7. Athirappally Hydroelectric Project.
8. NH66 Development Thiruvananthapuram (Karamana- Nemom)
9. NH66 Development Thiruvananthapuram (Nemom -Kaliyakkavilai)
10. SH8 Development (Moovattupuzha-Poonkunnam)
11. SH8 Development (Poonkunnam – Punaloor)

12. NH 66 Developments, Kozhikode.

SELECTION OF FACTORS

For performing QCA and for formulating the truth table it is required to identify the factors, which determines the project success. The factors are identified from previous similar studies and from similar case studies conducted in Kerala. Total 20 factors were identified; these factors seem relevant in current scenario to be checked prior to the commencement of work. In addition, later these factors had reduced to 15 factors by clubbing some and dropping some based on relevance to project success. Finally obtained factors are,

Script	Factors	Criteria
F1	Eviction from own land	If the number of peoples those who were evicted from their land is less than 10% and the affected peoples are scattered at different locations geographically. And also the chances of gathering into a group is less, then this factor need not be considered as a critical factor
F2	Loss of Built-up Properties	If the loss of built-up properties happens in a commercial area, which affect the trade and commerce of that location then this factor should be considered as a critical factor. In addition, loss of other built-up properties too.
F3	Loss of Livelihood (Home & living atmosphere)	If the number of peoples those who lose their livelihood is less than 10% and the affected peoples are scattered at different locations geographically. And also the chances of gathering into a group is less, then this factor need not be considered as a critical factor
F4	Loss of Productive Aspects	If the number of peoples those who lose their productive aspects is less than 5% and the affected peoples are scattered at different locations geographically. And also the chances of gathering into a group are less, and then this factor need not be considered as a critical factor. Otherwise it is required to be treated as a critical factor.
F5	Displacement of Vulnerable groups	Vulnerable families (example; natural calamity affected families), women-headed households, slum peoples etc. are considered as vulnerable groups. They should be given more care during acquiring their lands or productive aspects. In most cases, they are residing as groups if such group are present in our project area, then their presence should be considered as a critical factor
F6	Loss of Religious Structures	Identify is there any religious structures are present in the project affected area, and then they should be considered.
F7	Loss of common properties	Check if the loss of any common properties such as road or bridges isolates a group of people completely, or it establishes any restrictions against their freedom of handling their productive aspects. (consider previous cases in the same type of infrastructures)
F8	Protest from People side, in fear of Pollution	Consider the nature of infrastructure and consider previous experiences too. Check for chances of pollution in previous experiences and compare that with the particular site
F9	Protest from People side, in fear of loss of	Check if there any restrictions are made in the similar type of cases before and check is there any chances for the same here. If it finds any chances of public

	their conventional life means	opposition in fear of loss of their conventional life means and productive aspects, then it should be treated as a critical factor.
F10	Protest from People side, due to political issues	Check the political background and nature of the area. If it finds any trace of opposition due to political reasons, then it should be treated as a critical factor. Can also check for the political nature of local bodies. In addition, can check the previous experiences too.
F11	Encroachment Problems	Check if the encroachment is single or by a group, if it was a group it should be treated as critical.
F12	Cultural and Heritage issues with Project	Identify the cultural and heritage structures and importance of that area and understand the dynamics of people.
F13	Lack of Labour, Labour strike	Check from previous experiences of that place if there are any chances for labour strike or labour protests
F14	Interest of authority over the project	Check that the local body completely supports the project or not. Check the political background of state cabinet and local body too. A check if there is any conflict in between political parties in case of a particular project.
F15	Damages to nearby structures	Check whether that did, the upcoming project will make serious damages or failures to the nearby structures. Check for the nature of construction too.

ANALYSIS

In following collection and organizing the data for each case, a truth table was assembled which the truth table containing the factors F1 to F15 listed in one axis and the cases C 1 to C 12 are listed in the other. Binary notations (0 and 1) are used to notate whether the factor is present or not in a particular case study. If a factor is present in a case study it was marked as '1' and if absent it was marked as '0'.

TRUTH TABLE

The researchers reconstructed a raw data matrix as a truth table represented in a binary form, "a synthetic display of all configurations based on given data set (Jin Ouk Choi et al. 2016). Of the total 12 cases, we had fixed success criteria to identify whether the cases are individually a success or failure. After that, we began by examining each case with the 15 factors, and if that factor was present, in that case, it was graded as '1' and if not present it was graded as '0' and formulated the truth table.

SUCCESS CRITERIA

Success criteria or a person's definition of success as it relates to a project often changes from project to project depending on participants, the scope of services, project size, the sophistication of the client related to the design of facilities, technological implications, and a variety of other factors. On the other hand, common trends relating to success criteria often develop not only with an individual project but also across the industry as we relate success to the perceptions and expectations of the client, designer, or contractor. Differences in a person's definition of success are often very evident [8].

In this, study the success criteria that are defined from a stakeholder side. The criteria were fixed from expert opinions and previous experiences of the study area. Here a project is said to be a successful one it should minimally meet the following criterion

- Projects that have been completed on time.
- Projects, which have consumed 50% additional time than its scheduled time for completion (only if the work maintains good quality and consumer satisfaction).
- Projects which have a cost overrun less than 25% (if the factors which adversely affected the project,

happened on the site which is beyond our control).

- Projects which had attained 100% public acceptance

Table on project success

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
F	S	F	S	F	S	S	S	S	F	F	F

RESULTS AND DISCUSSIONS

Of the total 12 cases, we had fixed success criteria to identify whether the cases are individually a success or failure. After that, we began by examining each case with the 15 factors, and if that factor was present in that case it was graded as 1 and if not present it was graded as 0 and formulated the truth table. After identifying whether the case is a success or failure and formulating the truth table it was started to

identifying the various combinations occurred by Boolean minimization. It was observed that some critical factors which can make a project fail had occurred in some successful projects too. Then it made another conclusion that the coping mechanism employed in that particular case made that project to overcome that critical factor, from the light of this various coping mechanism adopted in different projects to overcome critical factors are also explored.

TRUTH TABLE

	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
F1	1	0	0	1	1	1	1	0	0	1	0	1
F2	0	1	1	1	1	0	0	0	1	1	0	1
F3	1	0	0	1	1	1	1	0	0	1	1	1
F4	1	0	0	0	0	1	0	1	0	0	0	1
F5	0	0	0	1	1	0	1	0	0	1	1	1
F6	1	0	0	1	1	0	1	1	0	1	0	1
F7	1	0	0	0	0	1	0	0	0	0	1	0
F8	0	0	0	0	0	0	1	1	0	0	1	1
F9	1	0	0	1	1	1	1	0	1	1	1	1
F10	1	0	1	0	1	1	1	1	1	1	1	1
F11	0	1	1	1	1	0	0	0	1	1	0	1
F12	1	0	0	0	0	0	0	0	0	0	1	0
F13	0	0	0	0	0	0	0	1	1	0	0	0
F14	0	0	1	0	1	0	0	0	0	1	0	0
F15	0	0	0	0	0	1	1	1	1	0	0	1

NECESSARY CONDITIONS FOR PROJECT FAILURE

The results of analysis if necessary conditions, which results in project failure are described below. Of the 12 case studies listed 6 are considered to be successful projects and remaining

6 are failure projects. The results of the necessary analysis imply that the increase in a number of factors listed will increase the complexity of the project. Increase in a number of factors indicates the increased rate of public opposition against the project.

TRUTH TABLE- FAILURE PROJECTS

	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13	F14	F15
C1	1	0	1	1	0	1	1	0	1	1	0	1	0	1	0
C3	0	1	0	0	0	0	0	0	0	1	1	0	0	1	0
C5	1	1	1	0	1	1	0	0	0	1	1	0	0	1	0
C10	1	1	1	0	1	1	0	0	0	1	1	0	0	1	0
C11	0	0	1	0	1	0	1	1	1	1	0	1	0	1	0
C12	1	1	1	1	1	1	0	1	1	1	1	0	0	1	0

TRUTH TABLE- SUCCESSFUL PROJECTS

	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13	F14	F15
C2	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0
C4	1	1	1	0	0	1	0	0	0	0	1	0	0	0	0
C6	1	0	1	1	0	0	1	0	1	1	0	0	0	0	0
C7	1	0	1	0	1	1	0	1	1	1	0	0	0	0	1
C8	0	0	0	1	0	1	0	1	0	1	0	0	1	0	1
C9	0	1	0	0	0	0	0	0	1	1	0	0	1	0	1

COPING MECHANISMS FOR PROJECT SUCCESS

Factors	Coping mechanisms
F1	Timely revision of compensation rates from Government side.
F2	Intervention of the court for the payment of fair compensation on time
F3	Intervention of the court for the payment of fair compensation on time
F4	Involvement of local bodies in setting up of acceptable rehabilitation measures
F5	Provide attractive rehabilitation packages and acceptable compensation on time.
F6	Provide attractive rehabilitation packages and acceptable compensation on time.
F7	Provide opportunities to set up new environment.
F8	Providing them proper rehabilitation packages.
F9	The involvement of local bodies plays a very vital role handling vulnerable groups.
F10	Providing them land for reconstruction of the religious structure.
F11	Interaction with religious leaders to reduce the chance of opposition.
F12	Has to be restored simultaneously
F13	Needs to be reconstructed and modernized
F14	Adopt more environmental friendly construction methods.
F15	Reduce maximum chances of pollution
F16	Provide attractive rehabilitation packages and acceptable compensation on time.
F17	Interactions with the local political parties to ensure a fair atmosphere.
F18	Forceful eviction.
F19	Try to provide rehabilitation packages.
F20	Try to protect the structures having cultural importance.
F21	Interaction with the local trade unions.
F22	Co-operation between the state cabinet and local bodies
F23	Demanding securities from the company to cope the damages.

FRAMEWORK

The framework proposed comprises of 2 steps. In the first step, it was required to evaluate the adverse factors in a particular location using the criteria listed in table 3.13. In step 2 it was required to list out the possible coping mechanisms that are listed in table above for the critical factors of that particular site.

CONCLUSIONS

The research demonstrates the importance of understanding and predicting the dynamics of

people against setting up of infrastructural projects for the successful completion of the project. In this research, critical factors, which can lead to public opposition to an infrastructural project, are identified. The factors are, F1- Eviction from own land, F2- Loss of Built up Properties (Commercial space & Other Infrastructures), F3- Loss of Livelihood (Living atmosphere), F4- Loss of Productive Aspects (Farm lands and other productive aspect), F5- Displacement of Vulnerable groups, F6- Loss of Religious Structures F7- Loss of common properties, F8- Protest from People side, in fear of Pollution, F9- Protest from People side, in fear of implementation of restrictions once

the project was completed, F10- Protest from People side, due to political issues, F11- Encroachment Problems, F12- Cultural and Heritage issues with Project, F13- Lack of Labour, Labour strike, F14- Attitude of authority towards the project, and F-15 Damages to nearby structures

These factors are important and can be evaluated prior to implementing a project at a site.

Along with identifying the factors that can adversely affect projects, a framework was developed. The framework comprises of coping mechanisms for all the adverse factors. Current study can help the decision makers to systematically analyse the suitability of a location for a proposed infrastructural project.

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