Research Article

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Feasibility studies and their effects on the success or failure of investment projects. "Najaf governorate as a model"

Abstract: A feasibility study is considered a strategic tool, a critical principle, and an essential stage of the success of the investment project, and it is regarded as an essential point in the success or failure of the investment project. Therefore, feasibility studies are among the most critical elements of the success of investment projects. The purpose of this study is to find out the reality of the feasibility study in the various departments of the state and its impact on the success or failure of investment projects, in addition to studying, identifying, and analyzing the factors that affect the feasibility study in investment projects. In this research, 23 influential factors were collected from site surveys, interviews with engineers and experts, and previous research in the Arab world. These factors are grouped into five categories: political and legal aspects, economic and financial, consultancy, owner, and contractor. A questionnaire survey of 70 respondents was distributed among different experts. A statistical analysis was done using SPSS and Excel packages. The results accomplished from the survey revealed the significant factors that affect the feasibility study (ranked respectively), namely, the absence of a clear investment policy (86%), the existence of obstacles (85.71%), slow and complicated routine procedures (84%), lack of experience and field knowledge (82.29%), and failure to accurately meet the scientific (79.71%) These findings could help the construction professionals to improve the feasibility study and project performance in Iraq.

1 Introduction

Many studies and research in this field have shown that one of the most important reasons for the failure of public and private investment projects is the weak awareness of the authorities responsible for the investment of the importance of feasibility studies and their leniency in providing the conditions and foundations that must be prepared and considered as one of the formal requirements for granting investment licenses as well as the absence of standards based on which the investor is differentiated. The research originality of this research is the study and analysis of the reality of stalled investment projects in Najaf and the study of its main reasons.

Early in the 1960s, the terms "feasibility study" and "feasibility analysis" were coined in the accounting and economic sciences to describe examinations and thorough reviews to ascertain the viability of various investment options by calculating the advantages and disadvantages to extract measurements for each option [1]. The feasibility study's findings, coupled with a detailed implementation plan, assist in choosing a specific project that fulfills the project's stated objectives [2,3]. When a particular course of action is evaluated for suitability in a given situation with restricted resources, a real estate analyst can confidently say that defined objectives will be achieved [4].

The following studies serve as the frameworks for the dimensions of business viability in this article: (market, economic, financial, technical, environmental, legal, schedule, and administrative). These investigations represent the basic categories of feasibility studies, which are crucial to any framework [5,6]. Any building process has a variety of variables and notions that could have both positive and negative consequences [7,8]. These variables, which have varying degrees of effects (up or down), are detailed in a

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preliminary feasibility study in an organized building [9,10]. The feasibility study thoroughly examines the project's viability, considering all relevant technical, financial, legal, and scheduling considerations [11]. A feasibility study collects and organizes all the information required to create a successful company [12]. Today, it is one of the most significant tools for strategic planning. Also, the feasibility study is a powerful tool for strategically managing projects in various economic and investment activities, enabling investors to make decisions throughout the project's lifespan with the least amount of risk (uncertainty) possible [13].

Feasibility studies were created based on economic theory to assist in investing decisions with a certain amount of risk and/or uncertainty. This idea results from several internal and external future-related variables that may affect choices [14,15]. The government may finance more than 96% of domestic construction projects in Iraq. Due to construction project funding, more central and local government control of all local project schedules is required [16].

This study aims to analyze the relationship between the failure of investment projects for the study sample and the unreality of economic feasibility studies prepared by the investor. As well as to analyze the failure of many projects to identify the causes of this stumbling block in the Najaf governorate and find solutions. Therefore, this study is important in raising awareness among engineers of the importance of the feasibility study and the extent of its impact on the success or failure of investment projects.

2 Research problem

Due to the failure of many investment projects in Iraq, which may lead to weak opportunities for growth and development, the failure of these projects leads to the loss of other alternative options that can be exploited to avoid wasting human, financial, and other resources. Poor planning of investment projects, failure to adopt scientific methods to choose between investment alternatives and investors, granting investment licenses without fully and accurately providing the requirements for granting these licenses, and many obstacles that get out of control. Therefore, it is necessary to have real feasibility studies that simulate the reality of investment projects.

3 The reality of stalled construction projects in Najaf Governorate

The province of Al-Najaf is one of the province's religious and touristic allies, agriculturally and economically, as thousands of visitors from inside and outside Iraq flock to it daily. Therefore, the province urgently needs to develop infrastructure and investment projects [17].

After the issuance of Investment Resolution No. 13 of 2006 regarding the formation of the investment commission in the province of Najaf, this commission began to grant investment licenses. As of 2008, it led to increased investment projects in Najaf [17]. However, after implementing many of these investment projects, it was found that there was a delay and stopping or stumbling of many investment projects due to many obstacles and problems that directed the implementation of these investment projects. In this research, stopped and stalled projects were identified and classified according to all projects from 2008 to 2022, in addition to categorizing them according to project cost and project area [17].

3.1 Classification of the total projects with the identification of stalled and registered projects according to the project registration

Table 1 shows all the projects registered in the Investment Commission for the province of Najaf, focusing on the stalled projects. Table 1 also illustrates that the highest percentage of stalled projects was in the year 2019, and this is because it was the beginning of the Corona pandemic and its adverse effects on investment projects. Also, in 2014, there was an apparent increase in the stalling of investment projects due to the events of ISIS in most Iraqi governorates.

Table 1: Total and stalled projects by year [17]

Years	Total projects	Stalled projects	% stalled from total
2008	11	8	72.73
2009	27	19	70.37
2010	62	45	72.58
2011	57	43	75.44
2012	28	21	75
2013	4	2	50
2014	5	4	80
2015	22	13	59.10
2016	7	5	71.43
2017	30	17	56.67
2018	15	10	66.67
2019	16	14	87.5
2020	20	15	75
2021	15	11	73.34
2022	5	4	80
Total	324	231	71.30

Table 2: Total and stalled projects, according to the cost of the project [17]

Projects cost $	Total projects	Stalled projects	% stalled from total
Less than 50,000,000	189	111	58.73
50,000,001–100,000,000	15	11	73.34
100,000,001–150,000,000	4	3	75
150,000,001–200,000,000	3	3	100
More than 200,000,000	14	12	85.71
Total	225	140	62.20

3.2 Stalled investment projects according to the cost of the investment project

When the decision-maker lacks a clear vision or an accurate assessment of the project's cost, the investment cost is one of the most critical variables influencing whether the project is established. In addition, it is one of the most critical causes of projects stumbling and failing. According to the cost of the investment projects, Table 2 lists the halted investment projects.

It was noted from Table 2 that the highest default rate according to the cost of the investment project is projects less than 50,000,000 due to a large number of registered projects, which number 189, due to poor follow-up and monitoring of projects due to the lack of follow-up and supervision committees on investment projects.

3.3 Stalled investment projects according to the area of the investment project

Stalled projects will be classified according to the area of the investment project and determine the extent to which the area affects the success or failure of the investment project. Table 3 shows the volume of investment projects implemented in the Al-Najaf Governorate. Table 3 shows that the area of the project has a significant impact on the success or failure of the investment project.

4 Research methodology

This study is based on a site survey that attempts to gather all the required information effectively. Twenty-three influencing factors in feasibility studies were collected through an open questionnaire for experienced engineers and consultants, in addition to surveys from the archives of some engineering departments and previous studies. The components surveyed were divided into five primary sections: (1) political and legal; (2) economic and financial factors; (3) advisory factors; (4) owner factors; (5) contractor factors.

4.1 Design of the questionnaire

Three sections comprise the questionnaire: General information on the respondents is provided in the first section. Specialization, current employment, years of experience, academic credentials, and a union degree are also included. Selecting the proper choice yields the answer. Seven questions about the significance of the feasibility study on construction investment projects are included in the second section. The elements influencing the success or failure of the feasibility studies are represented in five tables in the third part. When designing the questionnaire, the arithmetic mean scale is combined with a five-point Likert scale [18].

Table 3: The area of investment projects according to the area of the project from 2008 to 2022 [17]

The project area	Total projects	Stalled projects	Stalled % from total
Less than 10,000 M^2	131	70	53.44
10,000 M^2 ≤ 20,000 M^2	20	14	70
20,000 M^2 ≤ 30,000 M^2	10	6	60
30,000 M^2 ≤ 40,000 M^2	9	5	55.56
40,000 M^2 ≤ 50,000 M^2	2	2	100
50,000 M^2 ≤ 60,000 M^2	1	1	100
60,000 M^2 ≤ 70,000 M^2	0	0	0
70000 M^2 ≤ 80000 M^2	2	2	100
80,000 M^2 ≤ 90,000 M^2	0	0	0
90,000 M^2 ≤ 100,000 M^2	4	4	100
100,000 M^2 ≤ 110,000 M^2	0	0	0
110,000 M^2 ≤ 120,000 M^2	2	2	100
More than 120,000 M^2	44	36	82.81
Total	225	142	63.00

The scale, therefore, ranges from (1 very low) to (5 very high). After reviewing and auditing to check its efficacy and suitability for construction projects in Iraq, a second evaluation was conducted to confirm the uniformity of the questionnaire's answers [18]. Twenty-three criteria affecting feasibility studies for investment projects in Najaf were included in the original questionnaire. A pilot test (pilot study) was undertaken before the questionnaire was made available to ensure it was structured more gradually and appropriately in a straightforward manner. Six arbitrators (of the degree of expert engineer) get the questionnaire's questions to use their competence to make the necessary corrections for omission and addition to arrive at the final version.

4.2 Sample size

Engineers who work as operational directors, project managers, project coordinators, construction managers, site managers, site engineers, superintendents, estimators, supervisors, and so on make up the sample of the target in the search. They are employed by both government and private contractor businesses in Iraq. Equations (1) and (2), which have been used by a number of researchers, including by Khaleel and Nassar [18], can be utilized to obtain a statistically representative sample of the target.

$$n = \frac{m}{1 + \left(\frac{m-1}{N}\right)}. \tag{1}$$

The population's sample size is unlimited (m), but the population's sample size is constrained (N). Equation (2) is applied as follows to determine the value of m:

$$m = \frac{Z^2 \times p \times (1 - p)}{E^2} \tag{2}$$

Here, Z indicates the degree of confidence (for instance, 2.92, 1.575, and 2.245 reflect the values of the confidence levels when 99, 95, and 90%, respectively); P is the level of contrast (0.5) between the components of the target sample; E stands for the chosen maximum error point. The estimated value m is the clear application of equation (1) When the sample size is not given, the significance level is set at 5% with a confidence level of 95%.

$$m = \frac{(1.96)^2 \times 0.50 \times (1 - 0.50)}{(0.05)^2} \approx 385.$$

4.3 Data collection

Engineers employed in both the public and private sectors and across various industries make up the research's

target sample. Using equation (3), one can determine the necessary sample size among the 90 engineers $N = 90$ to complete the task of the entire target sample [18]:

$$n = \frac{385}{1 + \left(\frac{385-1}{90}\right)} \approx 73. \tag{3}$$

Forms containing 90 questionnaires were sent to guarantee that the necessary sample size (73 samples) was obtained. The ratio (73% from the 90 Dispatcher questionnaires) is represented by the number of (73 questionnaires) timely submitted forms. After revision, 70 questionnaires were utilized in the analysis, representing 81.2% of the 100 dispatcher questions. Three questionnaires were removed because they were improperly filled out, bringing the total to participate to 70 questionnaires. Use the (relative importance index, RII) in accordance with the following equation (4), [18,19] to assess the data:

$$RII\%$$
$$= \frac{5 \times (n5) + 4 \times (n4) + 3 \times (n3) + 2 \times (n2) + 1 \times (n1)}{5 \times (n1 + n2 + n3 + n4 + n5)}, \tag{4}$$

where $n1$ is the number of respondents (R) who chose "little effect," "little effect," and "very high effect," and $n5$ is the number of respondents who chose "very high effect." These five expressions, in contrast, are defined as follows by equal intervals. (10.0 = little effect (LE), 20.0 = some effect (SE), 40.0 = average effect (AE), 60.0 = high effect (HE), 80.0 = very high effect (VHE), and 100 = very high effect).

4.4 Measuring the consistency of the questionnaire

In this study, the "Factors Affect Groups" questionnaire's stability is evaluated using the stability coefficient (Cronbach's alpha) Ca [18,19]. Ca should have a value between 0 and 1, where the closer to one the value, the higher the stability, and vice versa. As shown in Table 4, the Ca value for this section

Table 4: Reliability and validity of factors affect groups

Factors affect group	No. of factors	Reliability*	Validity**
Political and legal factors	5	0.91	0.95
Economic and financial factors	5	0.9	0.948
Consultant factors	7	0.89	0.9433
Owner factors	3	0.87	0.933
Contractor factors	3	0.92	0.96
Total factors affect group	23	0.9	0.95

*(Cronbach's Alpha, Ca), ** Validity = √Ca.

Table 5: Ranking political and legal factors

Political and legal factors	5	4	3	2	1	No	MR	RII	Rank
Slow and complicated routine procedures from the concerned government agencies	35	20	10	4	1	70	**4.200**	**84.000**	3
The existence of obstacles and problems in the land allocation and site handover procedures	36	22	9	2	1	70	**4.286**	**85.714**	2
Absence of a clear investment policy and site delivery	40	20	10	0	0	70	**4.429**	**88.571**	1
Constantly changing labor and raw materials wages	15	15	35	5	0	70	**3.571**	**71.429**	5
Chaos and lack of planning	20	17	33	0	0	70	**3.826**	**76.600**	4
Result of political and legal group	Degree of effect						**Mean**	**RII%**	**Rank**
	VHE						**4.06**	**81.25**	1

was 0.9, which shows a strong questionnaire's validity and reliability since Ca must be more than 0.7.

5 Results and discussion

In this study, 23 factors influencing the success or failure of investment projects were identified and arranged according to the relative importance index, along with eight factors demonstrating the significance of feasibility studies in construction investment projects. These variables have been divided into five groups and are listed in a single table. These programs were used to find the research's findings:

1. According to the participants, questionnaire responses, and frequency data, SPSS version 22 is used to determine the relative importance index and Cronbach's alpha of effect strength (ranging from 1 to 5) for each factor.
2. MS Excel 2015 software to apply the equation for calculating the important factor.

5.1 Political and legal factors

The "political and legal group" was divided based on the relative importance index and the rankings of the five factors, as shown in Table 5. With an RII of 88.57%, Table 5 reveals that the respondents ranked "Absence of a clear investment policy and location delivery" as the most crucial factor influencing them in this group. This result comes in first. While this group ranked first, the factor of "Constantly changing labor and raw materials wages" is the component that has the most negligible impact on feasibility studies in this group, with an RII of 71.43%.

5.2 Economic and financial factors

Table 6 categorizes the three components under the "economic and financial group" based on their relative relevance indices and rankings. According to Table 6, where the RII rate reached 79.143%, survey respondents evaluated "instability of exchange rates between the local and foreign currency" as the most crucial factor impacting feasibility studies in this group. With an RII of 67.71%, this group ranks fifth for the factor "Failure to accurately forecast all the financial expenses incurred by the project during the construction period," which is the least significant factor affecting workers' productivity in this group.

Table 6: Ranking of economic and financial factors

Economic and financial factors	5	4	3	2	1	No. R	MR	RII	Rank
Delay in financing and banking facilities for the project, which encourages investment activity	18	10	39	3	0	70	**3.614**	**72.286**	2
The absence of appropriate and soft financing means that it encourages construction activity	12	15	38	5	0	70	**3.486**	**69.714**	3
Instability of exchange rates between the domestic and foreign currency	27	17	22	4	0	70	**3.957**	**79.143**	1
The inability of these projects to obtain the necessary financing for investment	17	10	31	12	0	70	**3.457**	**69.143**	4
Failure to accurately forecast all the financial expenses incurred by the project during the construction period	11	11	42	6	0	70	**3.386**	**67.714**	5
Result of economic and financial group	Degree of effect						**Mean**	**RII%**	**Rank**
	HE						**3.58**	**71.60**	4

Table 7: Ranking of consultant factors

Consultant factors	5	4	3	2	1	No. R	MR	RII	Rank
Failure to accurately meet the scientific and technical requirements of economic feasibility studies	27	19	21	2	1	70	**3.986**	**79.714**	2
Incorrect assessment of project activity data	25	17	24	3	1	70	**3.886**	**77.714**	3
Misunderstanding of project objectives	15	20	29	4	2	70	**3.600**	**72.000**	6
Lack of experience and field knowledge	25	28	17	0	0	70	**4.114**	**82.286**	1
Misunderstanding of the stages and steps of conducting a feasibility study	27	19	21	2	1	70	**3.986**	**79.714**	2
Not understanding the risks associated with the project	6	8	35	14	7	70	**2.886**	**57.714**	7
Misunderstanding in the classification of project costs	18	18	30	3	1	70	**3.700**	**74.000**	4
Result of consultant group	**Degree of effect**						**Mean**	**RII%**	**Rank**
	HE						**3.737**	**74.74**	2

5.3 Consultant factors

As indicated in Table 7, the seven factors' relative relevance index and rankings were categorized within the "Consultant factor group." With an RII of 82.3%, the survey respondents ranked "lack of experience and field expertise" as the most crucial variable influencing feasibility studies in this group. In contrast, the least important factor affecting the feasibility study in this group, with an RII of 57.714%, was a "lack of knowledge of the hazards involved with the project." This team came in second.

5.4 Owner factors

According to Table 8, the three criteria are categorized inside the "Owner group" based on their relative relevance

indices and rankings. According to respondents, "Lack of a period during the conceptual phase" had the most significant influence on this group's feasibility study, according to Table 8, with an RII of 77.143%. In contrast, the factor "Failure to decide on the upper management is the component least affecting this group's feasibility study The influence of the elements classified as (12) was ranked in terms of its impact among all the factors examined. This team came in second.

5.5 Contractor factors

As indicated in Table 9, the seven factors' relative relevance index and rankings were categorized within the "Consultant factor group." With an RII of 72.571%, the survey respondents ranked "The lack of experience and

Table 8: Ranking of owner factors

Owner factors	5	4	3	2	1	No. R	MR	RII	Rank
Lack of local feasibility study database	15	23	32	0	0	70	**3.757**	**75.143**	2
Lack of period during the conceptual stage	18	24	28	0	0	70	**3.857**	**77.143**	1
Failure to decide on the upper management	12	19	39	0	0	70	**3.614**	**72.286**	3
Result of owner group	**Degree of effect**						**Mean**	RII%	Rank
	HE						**3.743**	**74.857**	2

Table 9: Ranking of contractor factors

Contractor factors	5	4	3	2	1	No. R	MR	RII	Rank
The lack of experience and competence of the company and its suitability	12	20	38	0	0	70	**3.629**	**72.571**	1
Low efficiency of administrative and technical performance of project management	12	17	37	4	0	70	**3.529**	**70.571**	2
The emergence of disputes between the partners in a number of these projects due to the lack of an internal and basic system	12	14	30	14	0	70	**3.343**	**66.857**	3
Result of contractor group	**Degree of effect**						**Mean**	**RII%**	**Rank**
	HE						**3.5.**	**70.00**	5

Table 10: The 10 most influential factors in feasibility study

Rank	Factors affect	Degree of effect	RII %	Related group
1	Absence of a clear investment policy and site delivery	VHE	86.00	Political and legal factors
2	The existence of obstacles and problems in the land allocation and site handover	VHE	85.71	Political and legal factors
3	Slow and complicated routine procedures from the concerned government agencies	VHE	84.00	Political and legal factors
4	Lack of experience and field knowledge	VHE	82.29	Consultant factors
5	Failure to accurately meet the scientific and technical requirements of economic feasibility	HE	79.71	Consultant factors
6	Failure to accurately meet the scientific and technical requirements of economic	HE	79.71	Consultant factors
7	Instability of exchange rates between the domestic	HE	79.14	Eco and financial factors
8	Lack of period during the conceptual stage	HE	77.143	Owner factors
9	Lack of local feasibility study database	HE	75.143	Consultant factors
10	Misunderstanding in the classification of project	HE	74.00	Consultant factors
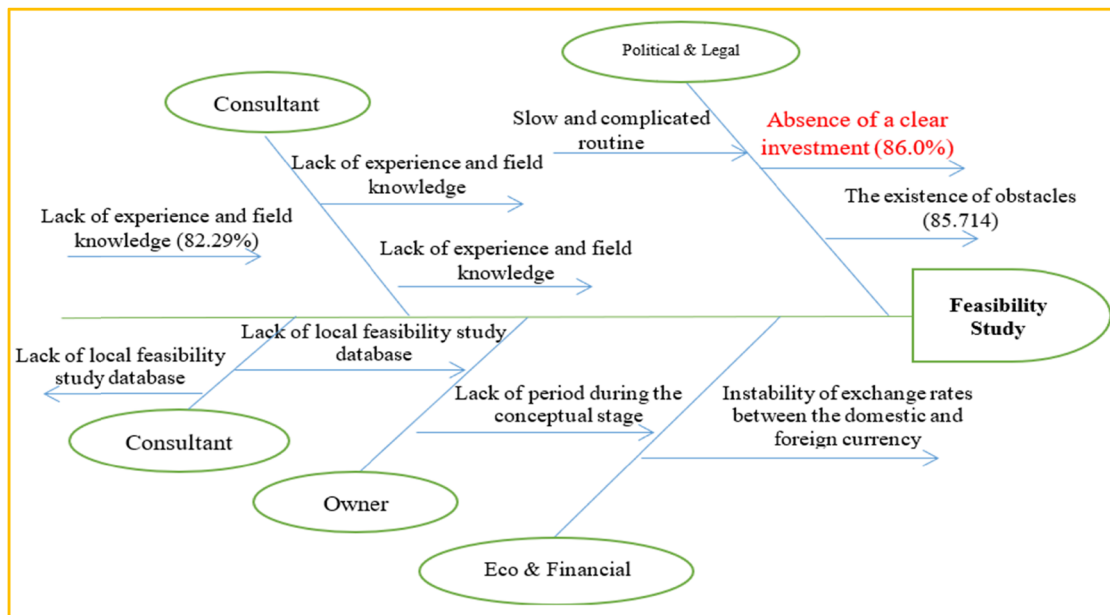
Figure 1: The ten most influential factors in feasibility study (using a fishbone technique).
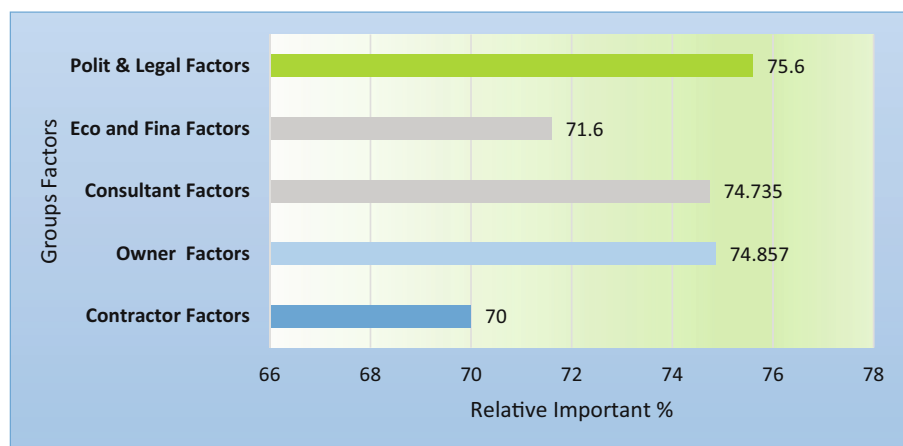
Figure 2: Relative important for all groups.

competence of the company and its suitability for the project" as the most crucial variable influencing feasibility studies in this group. In contrast, the least important factor affecting the feasibility study in this group, with an RII of 66.857%, was "The emergence of disputes between the partners in a number of these projects due to the lack of an internal and basic system." This team came in second.

6 The 10 most influencing factors for a feasibility study (using the fishbone technique)

A cause-and-effect diagram, also known as an Ishikawa diagram or a fishbone diagram, is a visual tool for classifying potential sources of an issue to determine its root causes. The survey results are presented in Table 10 and Figure 1, along with the factors that impact productivity most. The factor that ranked tenth in the ranking was "Misunderstanding in the classification of project costs" and the value of its relative importance index (74.00%). It was discovered that the most influencing factor was the "Absence of a clear investment policy and site delivery" and the value of its relative importance index (86.00%).

7 Classification of groups

The 23 factors identified were categorized into five groups. The order of these groups is related to the relative importance according to the evaluation of the engineers working in the construction sector in Iraq. Figure 2 shows that the most important group affecting the feasibility study in investment projects is the political, legal, economic, material, advisory, owner, and contractor groups.

8 Conclusions and recommendations

The researcher came to a number of conclusions and made the following recommendations after reviewing the theoretical underpinnings of the study, reviewing the status of investment projects in the province of Najaf, and using the statistical results of the questionnaire to examine 23 factors influencing the success of the feasibility study:

1. There were (231) stalled projects out of (324) total projects, a rate of (71.30%), which is a high percentage and shows that there were no meaningful feasibility studies conducted before the implementation of investment projects.
2. It was found from the questionnaire analysis that the most influencing factors on feasibility studies are as follows:
   a. Absence of a clear investment policy and site delivery.
   b. The existence of obstacles and problems in the land allocation and site handover procedures
   c. Slow and complicated routine procedures from the concerned government agencies
   d. Lack of experience and field knowledge
   e. Failure to accurately meet the scientific and technical requirements of economic feasibility studies
   f. Instability of exchange rates between the domestic and foreign currency
   g. Lack of period during the conceptual stage
   h. A lack of a local database for feasibility studies and incorrect project cost classification.
      Furthermore, the 23 factors considered in the study were divided into five groups, which were ranked according to their relative importance index:
3. Based on the results of this study, the following actions are recommended:
   a. Government agencies and the Investment Authority must spread and raise awareness among investors of the importance and usefulness of feasibility studies at the level of projects and the overall national economy.
   b. Dealing with stalled projects by a committee formed by government departments, the central government, and the Investment Authority to solve problems related to and causing stalled projects.
   c. Determine the powers between the Investment Authority and all other bodies and departments of the state to ensure noninterference in the powers and speed up the granting of licenses.

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