DELAYS IN IRRIGATION PROJECT AND ITS EFFECT ON PROFITABILITY

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Abstract- **Delay is one of the biggest problems often experienced on irrigation project sites. Delays can instigates negative effects such as increased costs, loss of productivity and revenue many lawsuits between owners and contractors and contract termination. The aim of this project is to investigate the causes and effects of delay on irrigation project time. Delay and cost overrun are inherent part of most projects despite the much acquired knowledge in project management. Although some may argue that this is negligible It is important to note that physical and economic scale of projects today is such that it is driven under the platform of profit to the parent organization, and of national interest the degree of success defined within the Iron triangle of cost, time, and scope.**

Keywords: Delays, Cost, economic, effects.

I. INTRODUCTION

In irrigation projects, delay could be defined as the time overrun either beyond completion date specified in a contract, or beyond the date that the parties agreed upon for delivery of a project. It is a project slipping over its planned schedule and is considered as common problem in irrigation projects. To the owner, delay means loss of revenue through lack of production facilities and rent-able space or a dependence on present facilities. In some cases, to the contractor, delay means higher overhead costs because of longer work period, higher material costs through

inflation, and due to labour cost increases. Completing projects on time is an indicator of efficiency, but the construction process is subject to many variables and unpredictable factors, which result from many sources. These sources include the performance of parties, resources availability, environmental conditions, involvement of other parties, and contractual relations. However, it is rarely happen that a project is completed within the specified time.

➢ Significance of the Study

The study hopes to be of significance to policy and decision makers in the agricultural sector in identifying measures to improve successful implementation of irrigation projects. In addition, the study hopes to assist project managers by providing insight into what factors may affect completion of projects that will guide in future planning. The study also hopes to be of significance to farmers and communities who are the intended beneficiaries of irrigation as it will provide information on mitigation of project completion which will improve irrigation projects service delivery. The study also hopes to be of significance to researchers and academicians on the factors affecting completion of irrigation projects.

II. LITERATURE REVIEW

Owolabi James D, Amusan Lekan M. Oloke C. O, Olusanya O (2014) The aim of this project is to investigate the causes and effects of delay on building construction project delivery time. Arbitrary sampling technique was used in this study. Delay is one of the biggest problems often experienced on construction project sites. Delays can initiate

negative property such as increased costs, loss of output and revenue many lawsuits between owners and contractors and contract stop. people sample of 150 was used in this work. A structured questionnaire in Likert scale was used in data collection. There are many factors that encourage delay on construction projects, however in some of recognized factors includes: lack of money to finance the project to completion, changes in drawings, lack of effective communication among the parties concerned , lack of sufficient information from consultants, slow decision making and contractor's insolvency, variations among others.

Anita Rauzana, (2016) Every construction project has a specific implementation plan, when the implementation of the scheme should begin, when to be solved and how it will carried out, and how the provision of resources. The success of a construction project depends on the collaborations between the parties concerned, namely the building owners, contractor and project planners. Many factors could hinder the functioning of construction projects. The achievement of carrying out construction projects on time with no any obstruction in the implementation is one of the most important goals. Project construction experience obstacles and constraints in functioning is a condition that is very undesirable, because it would be very detrimental to all parties. The difficulty will arise if there is no suitability between the plans that have been complete with the actual reality. Trouble that arises would be an obstacle to be avoided for the functioning of building projects can proceed smoothly. The result showed that the main reason of the factor that affect delays in the completion of project in Aceh Besar was communal and cultural factor.

III.   METHODOLOGY

The delay is a common problem in the global construction industry affecting development of the construction industry in particular and of the overall economy of countries in general.

➢   **Questionnaire design**

Questionnaires were distributed and were filled out by experienced construction professionals including technical consultants, main contractors and sub-contractors, and site/design engineers with a response rate of 78 %. The collected data were analyzed through Relative Importance Index (RII) method. The analysis included ranking the different causes according to the relative importance indices. Irrigation projects in Egypt have four participants:

i.   The government as the owner;
ii.   A consultant team usually from the faculty of engineering as the consultant;
iii.   Directorate of irrigation and transportation as the supervisor on the implementation; and
iv.   Contractors of irrigation projects as the real implement. The respondents samples had the three last participants excluding the owner (the government) with the one point of view.

➢   **Ranking of delay causes**

To provide a degree of importance for each delay cause, an important index was calculated in the same way as shown in Eq. (1).

$$RII_k^i = \frac{\sum_{i=1}^{5} W}{A X N} \qquad .... (1)$$

Where,

RII_k^i = the yearly experience of Relative Importance Index of each factor for each group of respondents;

W = the weighting given to each factor by the respondents (ranging from 1 to 5);

A = the highest weight (i.e. 5 in this case); and

N = the total number of respondents.

Overall Relative Importance Index for each factor of all respondents representing can be calculated by Eq. (2) This formula was used and the formulation consists of three groups as follows' Consultants group (i= 3) Site/design Engineers group (i= 2); and Contractors group (i= 1) considering all years of experiences of respondents together; which is calculated as a weighted average by RII.

$$ORII = \sum_{l=1}^{I=3} \frac{I}{6} X \left[\frac{\sum_{K=I}^{K=k}(K X RII_K^I)}{\sum_{K=1}^{K=k}(K)}\right] \qquad .... (2)$$

Where,,

    ORII = the weighted Overall Relative Importance Index for each factor; which is calculated based upon total years of experiences of all grouped respondents together;

    k = the number that represents' years of experience of grouped respondents

> ## Ranking of correlation

If there are no repeated data values, a perfect Spearman's correlation of +1 or _1 occurs when each of the variables is a perfect monotone function of the other. The value of the Spearman's rank correlation coefficient ranges from +1 (perfect positive correlation), to 0 (no correlation), to _1 (perfect negative correlation). The Eq.is used in the analysis.

$$\rho = 1 - \frac{6 \sum d^2}{(n^3 - n)}$$

Where

    q= Spearman's rank correlation coefficient; d= difference between the ranks indicated by two parties
    n =number of records.

> ## Proposed model

It was desired to compare the strength or the importance of each category; the weighted average value of category causes was calculated. The results are tabulated in by using priority rule formula as shown in Eq. (4) which used by is as follows:

$$ERII = (\frac{\sum_{n=1}^{n=N} P_n \; X \; ORII_n}{\sum_{n=1}^{n=N}(P_n)})$$

From previous analysis of collected data from irrigation construction projects field, it will be predicted approximately the irrigation construction actual duration of any new construction project before construction using following Eqs.

$$PDC = 1 + (\frac{\sum_{j=1}^{j=4}(d_j \; X \; ERII_j)}{\sum_{j=1}^{j=4}(ERII_j)})$$

$$PAD = PDC \; X \; PSD$$

IV. CONCLUSION

The reveals that one of the most critical factors of construction delay is the lack of commitment. The questionnaire design detail explain in this methodology. This finding is indeed a clear contrast to the findings of that financial problem of a contractor is the most important cause. Inefficient site management is certainly another key factors affecting time performance of most construction projects in India. This is due to lack of formal training among the site professionals who usually develop their supervisory skills by experience. Most notably, the importance of this factor, however in different orders, has been identified in the chapter on cost performance context in Indian irrigation projects.

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