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Studying the effect of modern construction technologies on time, cost, and quality of Iran mass housing projects

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ABSTRACT

The daily-incremental population of Iran and the incremental need for housing as well as the insufficient traditional construction systems of Iran have increased the tendency to use modern technologies in mass housing projects. It is tried in this research to study the effects of using modern construction technologies on time, cost, and quality of Iran mass housing projects, their problems, and ways to develop. The results of this research show that these technologies in Iran will accelerate project time up to 50% than the traditional technics. Moreover, construction costs reduced to 30% in projects with fewer housing units than the traditional technics, and costs reduced in projects with many units in total per capita. The maximum use of this technology in Iran is in the step of structure-basis and facility installation. In recent years, the entrepreneurs' tendency has increased toward modern technologies. Based on findings, providing the appraisal motives from some institutions such as municipality will increase public interest to use these technologies in the state. Based on the decision-making matrix of multi-criteria decision-making method, the maximum effect of modern technologies on Iran mass-housing projects have higher integrity and solidity of structure, better quality, the longer life-time of structure, acceleration in construction time, better resistance against earthquake, lower target costs in mass scale, beauty and lower harmful effects on the environment, better efficiency of the installation, and optimization of building energy consumption.

Keywords: **Modern technologies, Construction, Time, Cost, Quality, Mass housing projects.**

1. INTRODUCTION

The approach of using modern technologies in mass housing projects seems necessary by the occurrence of events such as the earthquake in Iran and the inefficiency of elementary and conventional systems of construction projects. The construction technologies in Iran can be generally classified as elementary construction, traditional construction, and new construction systems. The new construction system has been started in Iran since the history of construction to now and is still used in some countries and rural areas. In this technic, the bearing parts are made of clay and mud, wood and mud, rock and mud, or brick and clay. In addition, their cover is made of clay arch, wooden beam, or plant fibers. Some of the used human force in these buildings is skillful or half-skillful, and the accessible traditional materials are used. Construction by these technics has the minimum resistance against natural disasters (earthquakes, floods, storms, etc.), and can only be used as a temporary shelter. The construction operations in the traditional construction system were done by the experts, half-skillful, and navvy people. Buildings with brick-bearing walls were included in this classification. Some expert authorities using this system include navvy, masonry, plasterer, painter, blacksmith, plumber, electrician, insulation worker, tile-worker, asphalt-worker, glass-glazier, etc. This construction technic is used now in most rural and some urban areas of Iran or the margin of metropolises. The most skillful master masonries, delicate-touch workers, and traditional carpenters are found among these makers. Based on Iran regulations, the maximum permitted floor is 4, and the permitted height is 12 m. The new construction system,