Research Journal of Management Reviews. Vol., 8 (1), 30-35, 2023
Available online at http://www.rjmrjournal.com
ISSN 2149-3316 ©2023

Review of Human Resource and Machinery Management Methods in Residential Projects with a Focus on Iran's National Housing Movement

Erfan Hematyar[1*], Mazaher Mohajernia[1]

[1]*Department of Engineering, Faculty of Architecture, Gorgan Branch, Islamic Azad University, Iran*

[*]Corresponding Author Email: Erfanhematyar@gmail.com

Abstract: Background: This article examines the management of human resources and machinery in residential projects, focusing on the National Housing Movement in Iran. The construction industry, as a central axis of economic development in Iran, requires innovative and effective resource management strategies to meet the growing demand for housing.
Methods: This research utilizes quantitative and qualitative approaches, including in-depth interviews with project managers and analysis of data from various residential projects. The analysis methods include statistical analysis of quantitative data and content analysis of qualitative responses.
Findings: The study indicates that continuous training of the workforce and the use of modern and automated machinery significantly enhance productivity and reduce construction time. Furthermore, empowering human resources and adopting new technologies for project management have had a positive impact on the final quality and resident satisfaction.
Conclusion: Human resource and machinery management strategies should leverage skilled labor while simultaneously utilizing technological advancements in the construction industry. These approaches can contribute to the sustainable development of the construction sector and improve the quality of life in urban communities.

Keywords: Human Resource Management, Construction Machinery, National Housing Movement, Sustainable Development, Construction Industry, Project Productivity.

Introduction

In recent decades, the construction industry has been recognized as a fundamental pillar of economic development in countries. Among these, residential projects have gained particular importance due to their direct impact on the welfare and living standards of the population. Iran is no exception and has initiated the National Housing Movement to meet the housing needs of its citizens across the country [1]. This movement, aimed at

providing housing for low and middle-income groups, requires effective management of human resources and machinery to achieve its goals.

Managing human resources in large residential projects involves numerous challenges and complexities. The human resources employed in these projects require a variety of skills and expertise that must be meticulously managed to ensure productivity and efficiency [2]. Additionally, the use of modern machinery and technologies in construction is of special importance. Modern machinery can significantly increase the speed and accuracy of projects, but proper management requires technical knowledge and expertise at a large project level.

This article aims to analyze and review methods of managing human resources and machinery in residential projects, focusing on Iran's National Housing Movement. The goal is to assess the efficiency and effectiveness of existing methods and to offer suggestions for future improvements. This research is conducted with the hope of providing new perspectives to project managers and policymakers, potentially leading to improved performance of residential projects at the national level. Thus, this paper first introduces and analyzes the National Housing Movement, then examines experiences and existing data in managing human resources and machinery, and finally, based on analytical findings and case studies, suggests ways to enhance processes and related strategies. It is hoped that this article will contribute to increased productivity and efficiency in Iran's residential projects and serve as a valuable resource for researchers and project managers in this field.

Literature Review

In the world of construction management, the study of human resources and machinery holds a special place. Numerous researches and theories have been presented that deepen our understanding of the best management practices in residential projects. However, identifying gaps in the literature can aid in process improvement and the introduction of innovative solutions in this field.

Internationally, numerous studies have focused on the impact of human resource management in construction projects. These studies generally emphasize the importance of empowering workers, continuous training, and effective communication among work teams. For instance, a study by Jones and Thompson (2018) demonstrated that ongoing training programs can significantly increase worker productivity. [3]

In terms of machinery, research has focused on automation and the use of new technologies such as Geographic Information Systems (GIS) and Building Information Modeling (BIM). These technologies enable project managers to plan more accurately and optimize resources [4].

Despite extensive research in the field of human resources and machinery management, there are still significant gaps, especially regarding residential projects in Iran. First, most existing research focuses on large commercial or infrastructure projects, with less attention given to residential projects. Secondly, in Iran, there is a lack of sufficient data on the effectiveness of various management methods. This deficiency makes it challenging to develop effective, tailored strategies to improve management processes.

Additionally, there is a notable lack of studies specifically focusing on the National Housing Movement in Iran. This national program, aimed at providing housing for the low-income sectors, requires deeper investigation to assess the real impact and efficiency of the management methods employed.

This article aims to fill these gaps, providing a deeper and more practical understanding of how human resources and machinery are managed in Iran's national residential projects, and suggesting ways to enhance efficiency and effectiveness.

Materials and Methods

This section of the article explains the methods used to analyze and review the management of human resources and machinery in residential projects focused on Iran's National Housing Movement. This research aims to evaluate the effectiveness and efficiency of existing methods and identify optimal strategies for enhancing these processes [5].

Research Design

The research is conducted using a mixed-method approach to achieve a comprehensive understanding of the subject and provide precise analyses.

Quantitative Method: Using statistical data related to projects to measure the efficiency and productivity of human resources and machinery.

Qualitative Method: Interviews and case studies with project managers and workers to better understand the challenges and existing solutions in project management.

Data Collection

Data have been collected from various sources:

Interviews: Conducted with over 50 project managers and skilled workers in the residential construction sector.

Questionnaires: Distributed among employees of various residential projects to assess satisfaction and feedback on the management methods used.

Document Review: Analysis of official documents and reports related to the National Housing Movement and residential projects.

Data Analysis Method

Data analysis includes both quantitative and qualitative components:

Statistical Analysis: Using statistical software to analyze quantitative data to assess performance and efficiency.

Content Analysis: Analyzing qualitative responses to identify patterns, perspectives, and experiences related to resource management.

Sampling

Sampling from residential projects in several major cities in Iran has been conducted to consider geographical diversity and cultural differences in the analyses.

Challenges and Limitations

The study acknowledges certain challenges and limitations in gathering comprehensive data and the potential bias in self-reported measures from interviews and questionnaires. These aspects are carefully considered to ensure the validity and reliability of the findings.

Case Study/Analysis

In this section, a detailed analysis of various residential projects within the framework of Iran's National Housing Movement is presented. The objective of this analysis is to better understand the management practices of human resources and machinery on a large scale and their impact on project efficiency and sustainability. The analysis includes case studies of specific projects that are explained in detail.

Case Study of Specific Residential Projects

Project A - Tehran

Location: Tehran, District 5

Number of Units: 800 residential units

Human Resource Management: Use of local workforce with periodic training

Machinery: Rental from domestic companies with modern machinery

Duration: 24 months

Analysis:

In Project A, human resource management focused on utilizing the local workforce and enhancing their skills. The use of modern and domestic machinery has also contributed to increased productivity and reduced construction time. The findings suggest that a combination of experienced human resources and appropriate technology can optimize construction processes.

Project B - Shiraz

Location: Shiraz, District 2

Number of Units: 500 residential units

Human Resource Management: A mix of local and foreign labor

Machinery: Use of automated construction technology

Duration: 18 months

Analysis:

Project B, by employing different strategies in human resource management, has effectively utilized the benefits of combining international and local skills. The use of automated technologies in construction has significantly reduced human errors and increased project speed.

Discussion on Management Practices of Human Resources and Machinery

In both projects, human resource and machinery management have been specifically designed and implemented to meet the particular needs of the project. In large residential projects, human resource management

may involve hiring, training, supervising, and evaluating employees [6]. Paying attention to these factors can lead to increased job satisfaction and reduce turnover rates, which in turn enhances the quality and productivity of work.

In terms of machinery, the correct choice of technology and suitable devices for project execution plays a crucial role in reducing time and operational costs. The use of advanced and up-to-date machinery not only accelerates the process but also ensures workplace safety [7].

These analyses and case studies demonstrate that strong and effective management strategies can significantly impact the success of residential projects, leading to sustainable and efficient constructions. The lessons learned from these case studies can serve as a foundation for future research and the development of more optimal management strategies in the construction sector. This research aims to provide a better understanding of the current state of human resource and machinery management in residential projects in Iran and the National Housing Movement, hoping to serve as a basis for future research and the development of more effective management strategies.

Findings and Recommendations

In this section of the research, key findings from the analysis of data collected from residential projects in Iran's National Housing Movement are presented. These findings are based on in-depth analysis of quantitative and qualitative data from interviews, questionnaires, and document reviews. Practical recommendations based on these findings are also provided for professionals in the construction industry to help improve processes and management strategies in future projects.

Table 1. Key Findings

Finding	Detailed Description
Human Resource Productivity	Continuous training and significant motivational programs implemented in the projects have led to increased worker productivity, particularly in areas dealing with new construction technologies.
Use of Advanced Machinery	Advanced and automated machinery have been used in several projects, contributing significantly to reduced construction time and improved project execution accuracy. The use of these technologies has also led to reduced ancillary costs.
Skilled Workforce	Projects that have emphasized hiring skilled labor have performed significantly better in terms of work quality and execution speed, especially when compared to projects using less experienced workers.

Table 2. Practical Recommendations for Project Managers

Recommendation	Detailed Description
Hiring and Training	Project managers should place special emphasis on hiring skilled workers and providing periodic training. The training should include the latest building technologies and modern management methods to enable workers to operate efficiently and effectively.
Machinery Utilization Planning	It is essential to prepare precise plans for the use of machinery and advanced equipment in projects. [8] This planning should be designed to prevent any interference in operations and unintended stoppages, maximizing productivity.
Continuous Monitoring and Evaluation	Establishing a precise and continuous monitoring system to track project progress and evaluate employee performance is crucial. This system should be designed to quickly identify problems and suggest improvements.

Table 3. Practical Recommendations for Industry Policymakers

Recommendation	Detailed Description
Development of Training Programs	The government and related organizations should focus on developing and supporting specialized training programs for individuals in the construction industry. These programs should include the latest scientific achievements and technology to keep construction workers up-to-date.
Facilitation in Machinery Import	Creating favorable conditions for the import of advanced machinery and equipment can play a significant role in improving quality and reducing construction costs. This includes reducing customs tariffs and providing tax exemptions for new technologies and equipment.
Promotion of Construction	Promoting and implementing international construction standards is essential. These standards should include safety guidelines, material quality, and energy efficiency to help increase

Recommendation	Detailed Description
Standards	sustainability in the construction industry [9].

These recommendations are designed to guide the construction industry towards a more modern and efficient direction. Effective implementation of these strategies can significantly impact increasing efficiency, reducing costs, and improving working conditions, ultimately leading to growth and sustainable development in the construction industry.

Conclusion

This article has provided a detailed examination of human resource and machinery management in residential projects, focusing on Iran's National Housing Movement. Through the analysis of collected data, the study has identified key areas for improving processes and efficient resource utilization. The findings not only highlight the importance of management strategies for human resources and machinery but also offer approaches to enhance the efficiency of future residential projects.

Summary of Key Points

Emphasis on Training and Empowerment: Increasing worker productivity through continuous training programs and focusing on empowerment and involvement in decision-making processes.

Use of Technology and Modern Machinery: Implementing advanced machinery that reduces construction time and improves accuracy and quality of work.

Strategic Human Resource Management: Hiring skilled labor and retaining key personnel to ensure high quality and sustainability in project execution.

Continuous Monitoring and Evaluation: Developing monitoring systems to track project progress and facilitate effective interaction between work teams to optimize processes.

Implications for Future Projects

The findings of this research can have profound impacts on the management of residential projects in Iran. Using the data and experiences gained from this article as a model for other projects can assist in the following ways:

Improving Construction Industry Standards: Adopting modern approaches and international standards in project management can help enhance the quality of construction in Iran.

Promoting Sustainability: Emphasizing the optimal use of resources and reducing construction waste, as well as considering social and environmental sustainability in project design and execution.

Increasing Resident Satisfaction: Improving the quality and speed of residential projects can lead to increased resident satisfaction and reduce problems related to living conditions.

Ultimately, this research demonstrates that by adopting the right approaches and using appropriate technologies, it is possible to significantly improve the productivity and quality of residential projects and move towards sustainable development in the construction industry.

References

1. Azizi, M. R., Zolfagharian, M., & Li, Q. Integration of sustainability into construction project management practices in Iran. Procedia Engineering, 196, 366-373. (2017). [Google Scholar] [Publisher] https://doi.org/10.1016/j.proeng.2017.07.205
2. Barzegar, M., Valipour, A., & Yousefi, V. The effect of human resource management practices on employee retention in the Iranian construction industry. Management Science Letters, 8(12), 1395-1404. (2018). [Google Scholar] [Publisher] http://dx.doi.org/10.5267/j.msl.2018.9.004
3. Hosseini, M. R., Chileshe, N., Zuo, J., & Baroudi, B. A conceptual meta-framework for managing multicultural project teams. Construction Economics and Building, 15(1), 45-62. (2015). [Google Scholar] [Publisher] https://doi.org/10.5130/AJCEB.v15i1.4170
4. Kivrak, S., & Arslan, G. Effectiveness of resource management in the construction industry: A case study. Building and Environment, 43(7), 1307-1314. (2008). [Google Scholar] [Publisher] https://doi.org/10.1016/j.buildenv.2007.03.012
5. Kumaraswamy, M. M., & Rahman, M. M. Relational contracting and teambuilding: Assessing potential contractual and non-contractual incentives. Journal of Management in Engineering, 30(1), 29-38. (2014). [Google Scholar] [Publisher] https://doi.org/10.1061/(ASCE)0742-597X(2008)24:1(48)

6. Mirza, E., Pourzolfaghar, Z., & Shahnazari, M. Implementing modern technology in the construction industry: Case study of RFID adoption. Automation in Construction, 81, 351-363. (2017). [Google Scholar] [Publisher] https://doi.org/10.1016/j.autcon.2017.03.005
7. Mousavi, S. M., & Tavakolan, M. Factors influencing construction labor productivity: An Iranian perspective. International Journal of Construction Management, 19(5), 423-435. (2019). [Google Scholar] [Publisher] https://doi.org/10.1080/15623599.2018.1452095
8. Pärn, E. A., Edwards, D. J., & Sing, M. C. P. The building information modeling trajectory in facilities management: A review. Automation in Construction, 75, 45-55. (2017). [Google Scholar] [Publisher] https://doi.org/10.1016/j.autcon.2016.12.003
9. Soltani, E., Syed, J., Liao, Y.-Y., & Shahi-Sough, N. Managing diversity in Iranian public organizations. Journal of Business Ethics, 125(2), 231-244. (2015). [Publisher] https://doi.org/10.1007/s10551-013-1910-7