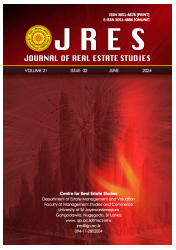

Available online at https://journals.sjp.ac.lk

JOURNAL OF REAL ESTATE STUDIES

ISSN 3051-4878 [PRINT] | E-ISSN 3051-4886 [ONLINE]

A Case Study on Factors Contributing to Time Delays of Government-Funded Affordable Housing Projects: ABC Residencies as a Case Study in Colombo Sri Lanka

M. A. Vichithra Sampath[a], Githmi Oshara Abeysooriya[b]* and E. A. Chaminda Piyashantha[c]

[a, c] *Urban Development Authority, Sri Lanka*
[b] *University of Sri Jayewardenepura, Sri Lanka*

ABSTRACT

Time delays are pervasive in construction projects, posing significant challenges in cost and quality management. This issue is particularly pronounced in government-funded affordable housing initiatives, which operate on limited budgets while striving to maximize community benefits. Such projects often rely on presale models where time overruns breed customer dissatisfaction. By examining a specific project undertaken by the Urban Development Authority, this study aims to uncover the root causes of delays, both internal and external, in ABC Residencies. Data collection was conducted through the study of project documents and interviews with the project team. Data analysis was performed through content analysis. It was found that employer-related factors internal to the project, such as scope changes and changes in external infrastructure work, and contractor-related factors internal to the project, such as the scarcity of skilled labor and project planning delays, contributed to the delays. Other internal factors included communication pitfalls. External factors causing delays included political risks, unexpected adverse weather conditions, unexpected social conditions, immediate neighborhood conditions, and unexpected global conditions. By identifying the causes of time delays, this study aims to inform future projects, enabling better planning and execution to minimize time overruns and their associated impacts.

ARTICLE INFO

Article History:

Received 29 April 2024
Revised 28 May 2024
Accepted 09 June 2024

Keywords:

Affordable housing, Construction time, Government funded projects, Time delays

* Corresponding author. Tel: +94 0702340685; Email: **githmiabeysooriya@sjp.ac.lk; https://orcid.org/0000-0001-9966-3653**
Institution: Department of Estate Management and Valuation. University of Sri Jayewardenepura, Sri Lanka.
Co-authors: [a] **0009-0009-6251-9434** | [c] **0009-0001-8027-572X**
Doi: **10.31357/jres.v21i2.7421**

1. INTRODUCTION

People are moving to urban areas for better opportunities, which has led to an increase in urban housing demand. It is estimated that by 2030, over 70% of the Sri Lankan population, will be living in urban areas (Bandyopadhay et al., 2020). According to the predictions made by the National Physical Planning Department 80% of population in Sri Lanka will become 60% urban by 2030 ("National Physical Planning Policy & the Plan — 2017-2050," 2019). Given the projected significant increase in the urban population, urban housing plays a crucial role in the process of urbanization in Sri Lanka. Rapid urbanization has resulted in housing shortage in major cities, especially in Colombo. The demand for affordable and quality housing often outstrips the supply, leading to higher property prices, particularly in the main city of Colombo, where property prices are increasing rapidly due to high demand and limited supply (Parikh, 2023).This has made homeownership challenging for many individuals and families.

Ensuring the availability of affordable housing is significantly important in effectively addressing the adverse implications of urbanization and yet, it is one of the biggest housing provision related issues in Sri Lanka (United Nations, 2014). Many individuals are compelled to seek alternative housing options, leading to the proliferation of informal settlements, such as slums and squatter areas. This surge in informal housing exacerbates various urban issues, including overcrowding, inadequate access to essential services, strained infrastructure, and complexities in urban planning and development. To create sustainable and inclusive urban environments, it is crucial for governments and stakeholders to prioritize the development of affordable housing (United Nations Human Settlement Programme, 2008) solutions that cater to the needs of the growing urban population. There are private sector organizations involved in building housing projects as well. Although the private sector is playing an active role in meeting housing demand, the primary motivation is high-profit margins. As a result, private sector housing developers tend to focus on developing luxury apartments (Karunanayake, 2019), leading to a scarcity of affordable housing in urban areas.

Real estate projects are subject to delays due to the intervention and actions of various stakeholders. Housing developments are no exception. Ensuring the timely inception and completion of a project is vital for a real estate development. This is especially crucial for government-intervened projects with limited funds and a strong emphasis on social welfare. Executing such projects according to the planned schedule is of paramount importance (Abeysinghe & Jayathilaka, 2022).

Therefore, the objective of this case study is to identify and reveal causes of time delays in government-initiated affordable housing projects, using the ABC Residencies case as a reference point. It is expected that the identified causes will enhance the existing knowledge on the causes of time delays and highlight the need for precautionary measures in future projects.

2. FOLLOWED APPRAOCH

A comprehensive literature survey was conducted to identify similar contexts on both local and global scales, as well as to explore theoretical implications. The primary method used for the case study was documentary review and team member interviews, which were utilized to gather data relevant to the specific project. By examining the project files available at the government institutions, the authors were able to identify causes of time delays in the projects and propose solutions to

mitigate them in future endeavours. The identification of these causes was further supported through informal discussions with three professionals involved in the project. Collected data was analysed through content analysis.

3. CASE BACKGROUND

Introduction

ABC Residencies is considered as one of the highlighted housing initiatives undertaken by the Sri Lankan government, to cater the middle-income group of the country, particularly the government employees residing and working within Colombo and its suburbs. The project originated through a budget proposal and with the approval of the Cabinet Ministers, the contract of the construction of the project was granted to CDE PLC for a contract period of 36 months. Selection of the construction contractor was done through an open tender procedure.

The funding mechanism was on the collection of pre-sales at various stages throughout the construction process. Additionally, the contractor was obligated to invest half of the contract amount during the construction period. The presale mechanism was collecting a reservation charge of one million, followed by balance payments divided into six installments, aligned with the execution of the transfer deed.

In the contract agreement, there were some fundamental requirements aligning with Urban Development Authority regulations and the Colombo City Development Plan and all other guidelines and regulations set forth by the relevant government regulated bodies. It was made a necessity that there should be a community hall facility, adequate parking spaces and other amenities such as a gymnasium, an entertainment area, a café, groceries and laundry facilities to ensure the wellbeing of the residents.

The contractor was endowed with the responsibility of preparing detailed drawings for the buildings and providing all other services such as infrastructure and facilities situated within the designated project land. The employer had the tasks of supplying the necessary infrastructure, encompassing elements like roads, water and electricity distribution, and surface drainage, extending up to the property's side boundary. Related to the conditions, it was mentioned that the developer is not entitled to make claims for compensation related to price fluctuations.

Extension of Time of a Project

Time management is one success factor of any construction project (Alharbi, 2020). As explained by Maués et al., (2017), in majority of the countries in the development world, construction deadlines are hardly met. Specially in a country like Sri Lanka, where the construction industry and the macroeconomic factors affecting the industry are highly dynamic, timely construction should be much concerned (Abeysinghe & Jayathilaka, 2022) as it eliminates uncertainties faced by the stakeholders, allowing them to have a better experience (Dhanuka, 2023).

Time delays can occur as a result of causes on the side of the actors internal to a project or due to external factors that are beyond the control of the parties directly involved in the project. Therefore, the review of a wide array of literature (Alharbi, 2020; Amoatey et al., 2015; Odeyinka & Oladapo, 1997) identified the following factors as the reasons behind project delays or extensions of time:

1. Factors internal to a project:
   - Employer-related
   - Contractor-related
   - Others
2. Factors external to a project

4. ANALYSIS

Factors Internal to the Project- Employer-related

1. Scope Changes

To fulfil the need for parking slots for all the apartments, the contractor had to add additional parking floors. Incorporating this extra scope into the master program had a significant impact on the project's timeline and cost. The revised work included the addition of five extra parking floors and three car park ramps. Consequently, the contractor requested a 135-day extension, which was recommended by the consultant.

The need to construct a swimming pool was identified sometime after the commencement of the construction work. It was observed that the well-being of the community significantly improved with its addition. To finish the construction of the swimming pool, an extension of time was requested. However, the impact of Covid-19 further delayed the construction, pushing the proposed completion date.

2.Changes in External Infrastructure Work

During the project construction, instructions were given to make changes to the security hut, gates, drain diversion along the boundary wall, and paved areas. These changes were considered in terms of architectural and structural design approval, procurement, and construction. As a result of these changes, extensions were granted.

Rubble wall with steel fence: The contractor requested a time extension for this aspect until April 14, 2020. However, since the work falls under the contractor's scope and it's their responsibility to provide everything as per the agreed contract document, the requested extension was not granted.

Factors Internal to the Project- Contractor-related

1.Scarcity of Skilled Labour

The contractor requested a 15-day time extension for this. However, as it is the contractor's responsibility to arrange skilled laborers according to the master program, the extension was not granted.

2.Project Planning Related Delays

Regarding the gas supply for the houses, the construction of a gas bulk tank was required. In relation to this task, the contractor requested a time extension in addition to the allocated time. The reasons for this extension were that the evaluation period of collected agreements from suppliers was conducted by the employer, and adjustments to the pre-designed gas tank were necessary based on the requirements of the chosen supplier. The finalization of the gas supplier was delayed due to a holdup in the submission of required details by the gas supplier. however, the complete responsibility for this scope lay with the contractor, who was operating as a Design and Build contractor. Consequently, no time extension was granted to the contractor for this issue.

3.Presidential Election

The contractor requested a 5-day time extension for the aforementioned event. Given that a presidential election occurs every five years, the contractor must plan accordingly for the master program. Therefore, the contractor is not entitled to any extension of time for the aforementioned event.

Factors Internal to the Project- Others

1.Communication Pitfalls

According to the contract document, the employer is responsible for providing the required infrastructure up to the site boundary, while the design and build

contractor is tasked with extending the electrical system from the end of the Ceylon Electricity Board (CEB) connection. As per the CEB clearance, the CEB supply includes only high-voltage metering without transformers and switchgear. However, as outlined in the contract document, the contractor's liability is limited to the civil work necessary for constructing the transformer room, excluding equipment. Consequently, to fulfill this requirement, the engagement of a third-party supplier incurs an additional cost. This situation was identified during the construction stage, necessitating an extension of the project timeline. To address matters related to the finalization of the transformer supplier selection, other design work, and the completion of the civil work related to the installation, an extension was granted to the contractor. This incident served as a landmark case, emphasizing the importance of identifying supply limitations during the project's design phase. Such proactive measures could have helped mitigate subsequent extra costs and delays, guiding the government to define the contractor's scope of work before commencing the project.

Factors External to the Project

1. Political Risk

The contractor was awarded the contract in 2014. However, due to a change in government in 2015, the project was suspended, and its activities were investigated by the state. As a result, the payment of mobilization advances was delayed. Consequently, the project's inception was postponed for one year and six months. As a result, the originally planned project completion dates were pushed back by another 2 years, anticipating numerous uncertainties that were yet to come.

2. Unexpected Adverse Weather Conditions

Having faced adverse weather conditions between September 2017 and September 2019, the contractor submitted a request for an additional 88 days to complete the project. This request was based on several reasons, including risks to worker safety, compromised quality of work, material damages, and lost productivity. Following the consultant's review of the wet month analysis, a recommendation was made to grant the claim for 77 days.

3. Unexpected Social Conditions

Due to the tragic situation in the country during the Easter bomb blast attack on April 21, 2019, the available labor force was unexpectedly reduced. As a result of this incident, the contractor requested a 30-day extension. However, taking into account the average labor force prior to the incident and the material supply shortages, an extension of 12 days was granted.

4. Immediate Neighbourhood Conditions

The contractor requested a 10-day extension due to a dengue fever outbreak. It was estimated that there would be an approximately 30% reduction in the labor force compared to the average due to this incident. The contractor justified this by explaining that even though the spread can be controlled within the site and future mosquito propagation can be managed by cleaning the area, the disease would continue to spread due to breeding sites in the neighborhood. Consequently, considering the unforeseen reduction in labor force, an extension of 10 days is granted for the request.

5. Unexpected Global Conditions

The contractor requested a time extension for the project primarily due to delays caused by the impact of the Covid-19 pandemic. According to site records, construction work was halted on March 16, 2020, due to the pandemic, and it resumed on May 11, 2020. However, due to ongoing Covid-19 restrictions, the

contractor could not operate at full capacity. The official restart date for the site work was determined as May 25, 2020, when the government lifted the lockdown status. The contractor asked for an additional 28 days to account for delays resulting from special health guidelines and the need to maintain required manpower. This extension request was granted, taking into consideration the project's working conditions.

5. DISCUSSION

A delay is generally defined as the inability to complete a given task within the expected timeframe (Alharbi, 2020). Delays in affordable housing projects cause inefficiencies that prevent project initiators from achieving the anticipated outcomes. Therefore, it is essential to analyze existing cases to mitigate future risks and uncertainties. The classification of delays is based on the characteristics of the project stakeholders contributed to such delays, the nature and severity of the delay, and the resulting impacts. The client and contractor are the primary stakeholders in a project, and it's commonly believed that most delays arise due to factors external to the projects.

In this context, on the employer's side, many delays result from their failure to identify deviations in the early stages. Communication breakdowns among parties also lead to significant delays, highlighting the need for effective communication during the early stages of engagement. External factors are often considered beyond control of the stakeholders. However, with strong internal collaboration, these can be mitigated. Predicting, forecasting, and taking precautionary measures, along with allocating sufficient time and resources in the schedule, are among the strategies. It is evident that almost all delays caused by external factors are critical (Alharbi, 2020) and result in significant time extensions. Additionally, delays due to political reasons, approval-related issues, and scope changes are found to be critical as they lead to substantial extensions.

Fund allocation method of a project primarily relies on pre-sale income, with all units being sold before construction begins. As a result, there is no method to recover additional costs during or after the construction phase of the project. During the pricing phase, provisions are made for future cost considerations. However, it is crucial to adhere to the project timeline without extensions, as delays could lead to increased costs. Additionally, homeowners have the right to claim compensation or seek other forms of relief if project timelines are extended. As part of this project, customers have requested an extension of their payments and have been granted a two-month extension for the third, fourth, and fifth installments. Moreover, as stipulated in the contract, the contractor is not entitled to claim for price escalation during the construction period. However, the contractor has claimed for design variations and time delays that are not liable with them.

Early identification of the future scope avoiding design changes during the construction stage, preparing a more realistic time schedule with allowances for uncertainties, establishing effective communication during the early engagement phase (Amoatey et al., 2015), and maintaining effective communication among stakeholders are crucial. Odeyinka & Oladapo (1997) specifically emphasize that the combined efforts of stakeholders and effective communication among them are the key factors influencing timely project completion.

6. CONCLUSION

Time being a crucial success factor in construction projects, it is vital to complete the projects within the scheduled period of time. Deviations from the expected time frame create many issues, such as cost

overruns, rework efforts, litigation problems, breakdown of goodwill, etc. (Amoatey et al., 2015). Specifically, in government-intervened projects, such as affordable housing projects that have limited funds and specific welfare goals, meeting the planned objectives on time is vital.

Different researchers have found and classified various factors affecting the time delays of affordable housing projects in different ways, depending on the project's associated stakeholders, the gravity of the impacts, and the source of origin. Time delays in the selected case study were classified based on the source of origin, namely internally created and externally created delays. Among these, externally created delays were the most crucial and were identified separately. Scope changes, alterations in external infrastructure work, scarcity of skilled labor, project planning related delays, communication pitfalls, political risks, unexpected adverse weather conditions, unexpected social conditions, immediate neighborhood conditions, and unexpected global conditions were identified as the causes of time extensions or delays in the selected case.

Observing the experiences of the case, steps have been taken to ensure effective communication among stakeholders in later government-initiated projects. Therefore, it is expected that the case study will shed light on the stakeholders of government-intervened affordable housing projects, making them more conscious of the potential causes of time delays and prompting them to take necessary adequate and appropriate measures. These measures may include early identification of the future scope avoiding design changes during the construction stage, preparing more realistic time schedules, and establishing effective communication throughout the project period. The anticipation is that avoiding time delays will lead to achieving the expected sustainability and welfare outcomes from the projects. Most importantly, a collaborative effort among stakeholders to communicate duties, plan for potential risks and uncertainties, and allocate resources will enable the timely completion of projects. Such efforts will also mitigate the impacts of external factors.

7. ACKNOWLEDGEMENT

The authors acknowledge the Urban Development Authority of Sri Lanka and the Centre for Real Estate Studies, Department of Estate Management and Valuation, University of Sri Jayewardenepura.

8. REFERNECES

Abeysinghe, N., & Jayathilaka, R. (2022). Factors influencing the timely completion of construction projects in Sri Lanka. *PLOS ONE*, *17*(12), e0278318. https://doi.org/10.1371/journal.pone.0278318

Alharbi, F. (2020). Critical delay factors in housing construction projects in Saudi Arabia: assessment and solutions. *Nottingham Trent University*. https://irep.ntu.ac.uk/id/eprint/42079/

Amoatey, C. T., Asabea, A. Y., Ebenezer, A., & Samuel, F. (2015). Analysing delay causes and effects in Ghanaian state housing construction projects. *International Journal of Managing Projects in Business*, *8*(1), 198–

214. https://doi.org/10.1108/ijmpb-04-2014-0035

Bandyopadhyay, S., Pathak, C. R., & Dentinho, T. P. (2020). *Urbanization and regional sustainability in South Asia: socio-economic drivers, environmental pressures and policy responses* (1st ed.). Springer.

Dhanuka, N. (2023). How timely delivery of projects is crucial for the growth of the Indian real estate sector. *The Times of India*. https://timesofindia.indiatimes.com/blogs/voices/how-timely-delivery-of-projects-is-crucial-for- the-growth-of-the-indian-real-

estate-sector/

Karunanayake, C. (2019). *Affordable Housing for Sri Lankans or Castles in the Sky?* Talking Economics. https://www.ips.lk/talkingeconomics/2019/07/09/affordable-housing-for-sri-lankans-or-castles-in-the-sky/

Maués, L. M. F., Santana, W., Santos, P. C. dos, Neves, R. M. das, & Duarte, A. A. A. M. (2017). Construction delays: a case study in the Brazilian Amazon. *Ambiente Construído*, *17*(3), 167–181. https://doi.org/10.1590/s1678-86212017000300169

National Physical Planning Policy & The Plan — 2017-2050. (2019). In *National Physical Planning Department*. National Physical Planning Department 5th Floor, Sethsiripaya Battaramulla, Sri Lanka. Retrieved July 14, 2024, from https://www.tamilnet.com/img/publish/2020/03/NPPD-ENGweb-27_12.pdf

Odeyinka, H., & Oladapo, A. A. (1997). The Causes and Effects of Construction Delays on Completion Cost of Housing Projects in Nigeria. *Journal of Financial Management of Property and Construction*, *2*(3), 31–44.

Parikh, R. (2023). *Colombo's looming housing crunch: "Brace yourself for rising apartment prices."* The Island Online; Upali Newspapers (Pvt) Ltd. https://island.lk/colombos-looming-housing-crunch-brace-yourself-for-rising-apartment-prices/

United Nations Human Settlement Programme. (2008). *The Role of Government in the Housing Market: The Experience from Asia*. Nairobi: UN-Habitat.

United Nations. (2014). *Housing and Sustainable Urban Development in Sri Lanka, UN Habitat III Country Report- Sri Lanka*. Ministry of Housing & Construction of the Government of Democratic Socialist Republic of Sri Lanka. https://habitat3.org/wp-content/uploads/Sri-Lanka-%EF%BC%88Final-in-English%EF%BC%89.pdf