

# Chapter 15

## BIM and M&E Systems for the Performance of Slum Upgrading Projects in Sub-Saharan Africa

**F. H. Abanda**

*Oxford Brookes University, UK*

**C. Weda**

*Monitoring and Evaluation Department, Africa Nazarene University, Kenya*

**M. B. Manjia**

 <https://orcid.org/0000-0002-1536-9068>

*Department of Civil Engineering, National Advanced School of Engineering, Yaoundé, Cameroon*

**C. Pettang**

 <https://orcid.org/0000-0002-5789-8654>

*Department of Civil Engineering, National Advanced School of Engineering, Yaoundé, Cameroon*

### ABSTRACT

*Recent research reveals a surge in the number of slums in Sub-Saharan Africa with no sign of abating. Thus, the upgrading of slums to improve the living conditions of those who live in such environments is imperative. However, the performance of past slum upgrading projects has been quite contentious with many failing to meet their pre-defined objectives. This study investigates the influence of integrated BIM and M&E on the performance of slum upgrading projects in Sub-Saharan Africa. A questionnaire was used to gather data from 88 M&E and BIM experts. It emerged that on average 68.6% “Agreed and Strongly Agreed” that integrating both M&E and BIM can significantly improve the performance of slum upgrading projects compared to each when applied in isolation. Consequently, future studies should focus on developing an integrated BIM and M&E framework for monitoring slum upgrading projects.*

DOI: 10.4018/978-1-6684-7548-5.ch015

## **INTRODUCTION**

### **Background**

Sub-Saharan Africa is home to some of the largest slums in the world with an estimate of over 55% of the urban population living in areas classified as slums and informal settlements (Adegun, 2018). The slums are characterised by very poor living conditions such as lack of services, easy susceptibility to health hazards and chronic poverty. Thus, many governments and international organisations are now implementing strategies to upgrade slum communities (Danso-Wiredu and Midheme, 2017). The long-term success of such projects requires effective decision-making informed by effective monitoring and evaluation (M&E).

However, due to the scale and complexity of such projects, traditional M&E have not led to any significant improvement in their performance. Many failed upgrading projects are now too common especially in developing countries (Tairo, 2013). Another major weakness that has plagued the construction industry in general and especially the upgrading projects is poor M&E. Recent studies by Damoah et al. (2015) and Damoah and Kumi (2018) revealed that, out of the 32 factors that cause project failures, poor monitoring is amongst the top ten. Furthermore, this is exacerbated by the fact that the participation in the design, monitoring and evaluation of slum upgrading projects of all stakeholders including residents or slum dwellers are often limited. The roles of slum dwellers are often limited to providing information to officials and designers of projects. In essence, there is a failure of interactive and in-depth participation of slum dwellers in the decision-making process. This is not just due to lack of political will. The fact is that effective citizen participation, particularly in informal communities, is quite a challenge. This is manifested in a number of ways including different and sometimes conflicting interests within communities, domination of the process by vested interests or sections of the community, lack of a common language (understanding) and protocol of information exchange, costs of travelling to workshop/meeting venues if outside the community and cultural perceptions. Furthermore, both ‘one-way’ and ‘interactive’ participatory methods are limited in capturing ‘real-time’ information over the project lifecycle especially given that informal community members may change their requirements many times during the project lifecycle.

According to UNCHS (2001), effective slum upgrading requires active involvement of the target beneficiaries. The World Bank (2012) proposed digital options instead of old fashioned “paper and pen” for data collection. Dickinson & Bostoen (2013) proposed an ICT-based conceptual framework for monitoring and evaluation of water projects to ensure better service delivery. Raftree and Bamberger (2014) explored how emerging ICT can be used to bring monitoring and evaluation up to speed. Emerging ICT provides the opportunity to involve citizens in the M&E of slum upgrading projects. However, given M&E is a domain often considered in aid development field, the typical ICTs often used include mobile phones and smart devices with limited applications of specialised construction-related software such as Building Information Modelling (BIM) software systems. Although still emerging, BIM has been hailed as a solution in overcoming long standing performance challenges in the construction industry where, slum upgrading partially fits. Furthermore, BIM can be easily used to foster participation of dwellers, manage and process huge data associated with slum upgrading projects due to their complex nature. Without a clear, effective and smarter way of monitoring and evaluating upgrading projects, ensuring access to sustainable, affordable and adequate housing and promoting slum upgrading as stated in the New Urban Agenda (UN-Habitat, 2016) and Sustainable Development Goal 11 will hardly be achieved.

17 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

[www.igi-global.com/chapter/bim-and-me-systems-for-the-performance-of-slum-upgrading-projects-in-sub-saharan-africa/315458](http://www.igi-global.com/chapter/bim-and-me-systems-for-the-performance-of-slum-upgrading-projects-in-sub-saharan-africa/315458)

## Related Content

---

### Metaverse Integration in Healthcare: Catalyst for Transformation or Fleeting Fad?

Princi Gupta (2024). *Social Innovations in Education, Environment, and Healthcare* (pp. 359-374).

[www.irma-international.org/chapter/metaverse-integration-in-healthcare/350606](http://www.irma-international.org/chapter/metaverse-integration-in-healthcare/350606)

### "Planning" or e-Planning?: Implications for Theory, Education and Practice

Ernest R. Alexander (2014). *International Journal of E-Planning Research* (pp. 1-15).

[www.irma-international.org/article/planning-or-e-planning/108866](http://www.irma-international.org/article/planning-or-e-planning/108866)

### Technology Use by Urban Local Bodies in India to Combat the COVID-19 Pandemic

Falguni Mukherjee (2021). *International Journal of E-Planning Research* (pp. 109-115).

[www.irma-international.org/article/technology-use-by-urban-local-bodies-in-india-to-combat-the-covid-19-pandemic/262512](http://www.irma-international.org/article/technology-use-by-urban-local-bodies-in-india-to-combat-the-covid-19-pandemic/262512)

### Is It the Right Time to Include Kahoot?: An Experiment on an English as a Foreign Language (EFL) Grammar Course

Iman Oraifand Palitha Edirisingha (2022). *International Journal of Smart Education and Urban Society* (pp. 1-18).

[www.irma-international.org/article/right-time-include-kahoot/299046](http://www.irma-international.org/article/right-time-include-kahoot/299046)

### A Case Study of Investigation of Crime Management System Using ICT

Soobia Saeed, N. Z. Jhanjhi, Mehmood Naqvi, Shakeel Ahmed, Mamoona Humayunand Vasaki Ponnusamy (2021). *ICT Solutions for Improving Smart Communities in Asia* (pp. 243-263).

[www.irma-international.org/chapter/a-case-study-of-investigation-of-crime-management-system-using-ict/272459](http://www.irma-international.org/chapter/a-case-study-of-investigation-of-crime-management-system-using-ict/272459)