

A Nexus between Project Management Lifecycle and Performance of Slums Upgrading Projects in Nairobi City County, Kenya

Janet Ombwayo¹, Harriet Kidombo¹ & Christopher Gakuu¹

¹ Department of Management Science and Project Planning, University of Nairobi, Kenya

Correspondence: Janet Ombwayo, Department of Management Science and Project Planning, University of Nairobi, Kenya. E-mail: janetombwayo63@gmail.com

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Abstract

The alarming rate of urban sprawl poses a social menace for city planners and governments worldwide and Nairobi city of Kenya is not an exception. Challenges of access to appropriate and affordable housing has forced majority of city residents to occupy shanties with deplorable living conditions thus, the need to improve the infrastructure in the slums. In Kenya, the government has initiated various projects in a bid to carry out a facelift of slums countrywide. Although, involvement of key stakeholders in each of the phases of project management lifecycle (PMLC) that is, project initiation, planning, implementation, Monitoring & evaluation and closure remains a critical factor to the realization of slum upgrading infrastructure development, the affected communities are not fully engaged thus thwarting effective implementation of the planned activities. In this regard, the aim of the study was to examine the influence of PMLC on performance of slums upgrading projects (PSUP). A descriptive survey research design and a correlational research design were utilized whereby data was analysed and interpreted using means, standard deviations, correlation of coefficient and correlation of determination. A sample of 266 was drawn from a target population of 794, of which 208 responded to a 5-point Likert Scale questionnaire. Qualitative data collected was presented in narrative form. Results obtained indicated a linearly positive and a very strong significant relationship between PMLC and PSUP. When all phases were combined PMLC explained 62.9% of the overall variation in PSUP. The findings indicate that a unit increase in initiation and planning stages result to an increase in PSUP by 7.77% and 1.97% respectively whereas for a unit decrease in project implementation and project M&E, PSUP decreases by 2.07% and 1.72% respectively. It was thus concluded that PMLC significantly influences Performance of Slum Upgrading Projects. The recommendation of the study was that activities pertaining to project planning, M&E and project closure phases be efficiently executed for optimum performance of the projects.

Keywords: slum upgrading projects, project performance, stakeholders, project management lifecycle

1. Introduction

1.1 Background to the Study

Globally, it is estimated that nearly one billion people currently reside in slum areas and according to the UN-Habitat, about 3 billion individuals require formal housing and good environmental living conditions by the year 2030 (UN Habitat, 2017a). Similarly, it is anticipated that by 2030, one in seven individuals on the planet would be residing in urban informal schemes or slums (Corburn & Sverdluk, 2017). The current affordable housing deficit stands at approximately 2 million houses with nearly 61% of urban households living in slums. This deficit continues to rise due to fundamental constraints on both the demand and supply side and is exacerbated by an urbanization rate of 4.2%, equivalent to 0.5 million new city dwellers every year (Maeri, Iravo, & Wanjala 2020). The need for proper housing also requires improvement of other infrastructure in slums.

World Bank purposed through the Action Plan dubbed 'Cities without Slums' to bolster the livelihoods of up to 100 million slum dwellers around the globe by the year 2020 (Killisch & Dietz, 2002). This situation to date still remains a challenge in the developing and underdeveloped countries. Slum upgrading projects aim to integrate informal neighbourhoods into the formal city and its urban management systems thus, refining living conditions as well as making available access to services and opportunities (Hwang & Feng, 2019). In practice, these projects normally encompass establishing proper communal facilities such as roads, water supply lines, and sanitation systems, and reorganization of the metropolitan facilities in additional spaces to establish secure as well as less

congested housing. MacPherson (2013) stated that many cities in Africa are neglected despite rapid urbanisation. Particularly, the services provided in slum areas fail to match the needs of slum dwellers thus contributing to high levels of poverty. In this respect, improvement of the well-being of billions of city dwellers is a focus of Sustainable Development Goals (SDGs). Thus, slum upgrading ought to be considered a vital strategy for equitable development, boost health and reduction of climatic change effects (Corburn & Sverdlik, 2017).

The population of 1.18 billion people in Africa as a continent is expected to double by the year 2050, with the continent's urbanization rate outpacing that of any other region worldwide (Bah, Faye & Geh, 2018). This is both an opportunity and a challenge for the African continent. The sector that deals with slum upgrading has been putting efforts to enhance growth economically in many cities among industrialized nations. Improved agglomeration in some countries in Africa has the ability to provide economies of scale and stimulate essential development of economies in the continent. The advantage of urbanization on the other hand, will only be realized with the formulation and implementation of favourable urban policies to solve urban infrastructure and acute housing shortages. However, this is not the case like in the previous years where slums proliferated due to lack of urban planning and inefficient policy execution. In Brazil, slum policies varied from forced removal and eradication to neighbourhood legalisation and urbanization (Atuesta, 2018). This therefore illustrates an imperative need for formation of new policies and strengthening the existing ones to ensure that urban re-development considers the infrastructural requirements of the urban population.

In terms of ecological, social, spatial and aesthetic aspects, the presence of shanty town segments has become a challenge to both the communities and the government. These situations are as a result of peoples' way of life such as, living in groups without considering spaces for supporting amenities in their habitat, when constructing residential homes (Supardi, Sudikno, Nugroho & Said, 2019). Consequently, the region where the houses are constructed does not take into consideration the spatial, ecological and social aspects, thereby turning the area into a shanty settlement. Generally, the slum regions are established in line with the developmental as well as compaction of the urban environs. Besides providing bad pictorial effects, shanty towns also contribute poorly to the growth of cities in overall without positive socio-economic impacts for the residents.

The definition given by Corburn and Sverdlik (2017) for slum upgrading is that land tenure, employment, housing, health services, infrastructure, and political and social engagement are all part of the process of delivering place-based environmental and social benefits to the urban poor. This study draws attention on how community members in the slums of Nairobi have participated or took part in the management of project lifecycle (PLC) of infrastructural projects focussed on bolstering the livelihoods of individuals in the slums spread across Nairobi County; Huruma, Mathare, Korogocho, Mukuru, Kawangware and Kibera, and how their participation has contributed to performance of projects initiated by either the government or other agencies.

Kibera located in Nairobi is still the second largest slum among African countries and the largest in Kenya (Mukeku, 2018). It lies on the south-west of Nairobi, 5 kilometres away from the central business centre or city centre covering an approximated area of 2.25 square kilometres. Kibera slum lies between two Nairobi divisional administrative areas; Lang'ata and Dagoreti divisions. The slum is segregated into 14 regions with varying inhabitants which include: Soweto West, Kianda, Gatwekera, Olympic, Karanja, Raila, Makina, Kisumu Ndogo, Lindi, Mashimoni, Kambi Muru, Silanga, Soweto East and Laini Saba (Mutisya & Yarime, 2011). In the year 1912 the British colonial government allowed Nubian soldiers to settle on this piece of land (Bodewes, 2005). They later fought on the ally side in the First World War. The rest of the slums follow in size and are located between 15 to 20 kilometres away from the Nairobi Central Business District (CBD).

The Mathare slum in Nairobi is Kenya's most highly inhabited neighborhood, with 68,941 individuals per square kilometre in comparison to national average of 82 people per square kilometer (Kariuki, 2019). The low-income community which exhibits a population of 206,564 continues to face some social and health related issues including gang violence, cholera outbreaks and building collapses caused by unplanned developments that have deprived people access to vital facilities. It is divided into 13 villages. These (Corburn, Ngau, Karanja & Kamau, 2012) include: Mathare 3A/Bondeni, Kosovo, Mashimoni, Kiamutisya, Mabatini, Gitathuru, Mathare 4B, Mathare 3C, Mathare 3B, Mathare No. 10, Village 2, Kwa Kariuki and Mathare 4A. Some of the projects in Mathare include the plan by Nairobi City Council for Kosovo whereby the Nairobi Water and Sewer Corporation (NWSC) chose to invest in construction of piped water. The community wanted to terminate cartel control of its water distribution, and the NWSC wanted to reduce income leakage from connections done illegally. 180 households had individual household connections by June 2011 whereas, hundreds more were in the process of receiving metered connections, and thousands more were getting water from at least three new community-owned and operated water kiosks (Corburn, *et al.*, 2012).

The Kawangware slum being among the biggest informal settlements in Kenya is situated 15 kilometres to the west of Nairobi City Centre. The report by Kenya National Bureau of Statistics (KNBS) and UN HABITAT affirm that the entire Kawangware region occupies about 291,565 individuals (UN Habitat, 2020; KNBS, 2019), and 80,000 individuals are thus projected to be living in informal settlements. The community is distinct from other Nairobi slums in that its informal areas spread into both planned scheme and peri-urban areas. The scheme is made up of a number of villages that spatially overlap with planned regions, making it difficult to distinguish between formal and informal settlement areas. Therefore, there are nine defined villages which are Congo, Kabiria, Sokoni, Muslim, Gatina, Wanyee, Kabiro and Riruta. Rapid sprawl and unplanned settlements characterize the settlement which lacks further crucial sanitation, health and social services.

The French-based Institute for Research in Africa (IFRA) showed that Korogocho slum located in Kasarani District is among Nairobi's biggest slums, with about 34,152 individuals living on around 50 hectares of property controlled by the Kenyan government (IFRA, 2011). Korogocho A, Gitathuru, Grogan A, Korogocho B, Kisumu Ndogo, Grogan B, Highridge and Nyayo are the eight villages that make up Korogocho. It is adjacent to Nairobi's largest dumping site, Dandora. The Korogocho slum began in the year 1960s and flourished in the year 1970s as residents were relocated from other Nairobi slums that were being razed. It is marked by high rates of crime, poverty and joblessness. Basic services and infrastructural amenities, like sanitation, water, roads access, hospitals, education and electricity are also in short supply. Recycled resources like mud, timber, corrugated iron sheets and natural stone are utilized to construct the houses in Korogocho. The Korogocho Slum Upgrading Programme is a combined endeavour of the Kenyan and the Italian government, with funds provided by a development debt swap signed by the two countries in the year 2008 (IFRA, 2011).

Mahira, Ghetto, Gitathuru, Kambi Moto, Redeemed and Ex Grogan are among the six settlements that make up Huruma slum in Nairobi's Starehe Constituency (Ettyang, 2011). The six villages which comprise a total size of about 4 hectares and over 2,700 houses were originally inhabited in the 1970s. Housing constructions within these settlements were basically 12 by 10-foot shacks made of wattle, mud and roofed by iron sheet and having earth floors before the upgrade. Basic services like water, sewage, road access, and bathrooms were also either insufficient or non-existent at the time. The community-led slum upgrading project was initiated by the then City Council of Nairobi (CNN) now renamed the Nairobi City County (NCC) under the new Kenya's 2010 Constitution. This approach established a wide set of standards for upgrading, emphasizing the significance of community participation at all phases. The Department of City Planning was the primary implementer of the strategy in Huruma. This department carried out a number of operations in relation to the regularization of tenure in the six villages.

Mukuru Slum in Kikuyu language imply "valley" (Makachia, 2011). Mukuru runs parallel to the Ngong' River, it has poor topography, is prone to floods, and is primarily used for dumping. Mukuru Kwa Njenga, Paradise, Mukuru Kwa Reuben, Sinai, Kingstone, Jamaica, Fuata Nyayo, Mariguini and Kayaba are among the nine villages that make up the slum. The settlement hosts a population of over 100,000 people. It stretches backwards to colonial period, and its residents are diversified and ethnically diverse. Mukuru being a slum is situated within the inner city and is bordered to the north and east by the Industrial Area and to the south and west by the South B housing estate. Land ownership in this area is by government, private corporations as well as individuals. Mukuru has been identified as an area in need of significant reconstruction and has been classified as a Special Planning Area (SPA) by the county administration.

In Mukuru, development of measures to modernize infrastructural needs and amenities such as drainage, roads, water resources and sanitation, educational, health, as well as recreational facilities was a two-year-long highly involved process (Earle, 2019). The idea was to reduce the number of Mukuru people who would be relocated as a result of the upgrade. The recarpeting and upgrading of 70 kilometres of roads to cabro and bitumen, construction of a 24-bed Level Three hospital in Mukuru Kwa Njenga and Mukuru Kayaba, construction of 15,000 housing units under the KENSUP and the issuance of 1,329 title deeds are undertaken under the programme (Kariuki, 2022). This therefore informed the need to explore the associated activities in project management lifecycle and their influence on performance of slum upgrading projects.

1.2 Statement of the Problem

A notable slum upgrading program is Kenya Slum Upgrading Programme (KENSUP) under auspices of the government of Kenya with support from UN-HABITAT launched and piloted in the Soweto East of Kibera slums in Nairobi, Kenya in 2004. There are also other slum upgrading initiatives by the national government and the county government of Nairobi. The reason to these initiatives has been to improve on road access, build a highly

diverse cosmopolitan village and economic stability (Miltra, Mulligan, Schiling, Vivekanda and Krause, 2017). However, a concern has been raised with regard to completion rate of some projects in the slums of Nairobi thus impacting negatively on performance ratings. For instance, the objective of the multimillion-dollar project that aimed to improve livelihoods of at least 5.3 million urban slum dwellers or 1.6 million households countrywide with access to low-cost housing by the year 2020 (Langat, 2019) is yet to be achieved. The project was initiated for piloting in Kibera, to be replicated in other major cities besides Nairobi. Earlier on, Muraguri (2011) noted that there were issues pertaining to governance and involvement of beneficiaries in decision making in the key activities of the pilot project.

In Mukuru slums, over 50 kilometres of roads are being constructed, storm water drains are laid, each plot access electricity, sewerage network and clean water (Weru & Cobbett, 2021). However, the residents have resisted forceful evictions to pave way for the constructions by engaging security officers in running battles and even filing court injunctions leading to stalling of these projects (Wanzala & Kweyu, 2021). In Mathare slum, Meredith and MacDonald (2017) noted that the Mathare 4A project commenced in March the year 1997 failed due to alienated locals. Hwang and Feng (2019) emphasize the need for involvement of local people and leaders from the onset of slum upgrading activities. In Korogocho, the slum upgrading projects targeting the youth revealed poor community participation and inadequate monitoring and evaluation (Ndungu & Karugu, 2019).

The Kibera's Soweto East is mapped into four zones (A to D). According to Miltra *et al.*, (2017) the original plan was to provide the residents temporary housing as the site was being cleared and houses built. Although the residents in Zone A were included in the master register, they did not significantly participate in both the planning and implementation phases of the project. Also, the number of people enumerated was higher than the housing units to be occupied. The UN-Habitat initiative was not the only project in Kibera that experienced challenges. Corruption in the allotment of finished dwellings hampered a project initiated by Kenya Railways in 2015 with Ksh. 7 billion (\$70 million) from the World Bank (Langat, 2019). The plan was to create housing and commercial structures for those living along the railway line that runs through Kibera, but delays hampered the project. To provide a 60-meter buffer from the train line, the design called for the construction of 3,129 single-room homes, 1,490 of which would be residential units. Thousands of families and businesses in the vicinity were displaced as a result. Businesses would be housed on the bottom floor, while apartments would be on the upper floors. However, according to the original slum dwellers, when the new houses, business premises were allocated and compensations made, they did not get any (Langat, 2019). Cherunya, *et al.* (2020) findings suggest that during KENSUP process the initiative's validity was impaired by a lack of understanding and concern of livelihoods rebuilding, which resulted in quick collapse of amenities and pushed most of the alleged 'beneficiaries' deeper into poverty. The researcher advised that improvement of living status be a primary activity in the design, implementation, and post-implementation stages for successful settlements upgrading.

Furthermore, research by Anderson and Mwelu (KENSUP/KISIP 2018) asserted that despite the fact that community participation is a fundamental component of the programs, public participation appears to be problematic (Muiruri, 2019). That, the project's target communities were not fully engaged in the implementation process. Residents in Kibera, for example, claimed that the government did not consult them while determining rent rates, making the houses not affordable by many people. This study rhymes with Meredith and MacDodald (2017) study that assessed success of KENSUP in building community engagement through field survey and interviews in Kibera Water and Sanitation Project initiated by UN-Habitat. Early on, the initiative had a lot of success in terms of community engagement, but it also had a lot of problems. The study suggested that organizations providing slum-upgrading projects should attempt to use an adaptive management approach and significantly promote community involvement in order to achieve effective, successful development outcomes. Krajisnik (2011) assert that slum populations in developing countries are underrepresented in decision-making and implementation processes. This finding supports the previous study conducted in Kibera slum on communal sanitation alternatives intended to boost the livelihoods of slum inhabitants that uncovered a concern with the participatory dimensions employed (Schouten & Mathenge, 2010).

The objective of this study was therefore to examine whether project management lifecycle influences performance of slum upgrading projects in Nairobi County, Kenya. Further, a multivariate analysis was adopted whereby a null hypothesis (H_0) was tested to determine the existence and significance of this relationship.

2. Review of Related Empirical Literature

2.1 Relationship between Project Management Lifecycle and Performance of Slums Upgrading Projects

The project lifecycle is influenced by Satyanarayana's (2008) analysis of project management activities in the agriculture industry. The essay emphasized the significance of the conceptualization phase in feasibility studies

for obtaining approval from authorities like the government and regulatory agencies. It stressed the importance of allocating and prioritizing project activities while ensuring that there is adequate time, budget, and personnel assigned to them.

Stakeholder participation is among the most effective approaches to empowering the poor and vulnerable individuals in the pursuit of the SDG 11, which mandates provision of shelter that is adequate, safe and cheaply acquired with basic services, and also slum upgrade (Aule, Juban & Ayoosu, 2019). Kimeto and Somba (2017) assert that understanding the participation process has repercussions for the success of any project that applies this approach. Kamuiru and Mbwise (2014), however, note that for most of the community development projects, participatory practice has not yet been cultured properly. Muniu, Gakuu and Rambo, 2017 recommended that beneficiaries of community projects should be involved in all stages of the project's execution and management. At the highest level of empowerment, community participation is considered as the most effective (Aule, *et al.*, 2019). Supardi, *et al.* (2019) discovered that participation of locals in urban slum initiatives bear a coefficient that is positively directed. The findings uncovered that the path coefficient is 0.450 and the t-statistic is 6.093 ($p < 0.05$), indicating that public engagement has a significant impact on the causes of urban slums. As a result, they came to the conclusion that more community engagement helps in alleviating the problems of urban slums.

Hwang and Feng (2019) study reconsidered two parts of a slum upgrading project in Baseco, a landfill on Manila Bay with a densely populated urban poor. The study looked at how open spaces have changed over the last twelve years and found three issues: 1) lack of community buy-ins to initiatives controlled by NGOs; 2) inconsistency between intended facilities and desired needs of the resident; and 3) misappropriation of resources to upcoming projects versus maintenance of extant projects. The study's findings advocate that appropriate project can be achieved by: 1) properly having knowledge on the needs and life status of the beneficiaries; 2) emphasizing leadership roles and participation by beneficiaries; and 3) reconsidering effectiveness of design and planning policies for informal schemes (Hwang & Feng, 2019). This study is supported by Matu, Kyalo, Mbugua and Mulwa (2020) whose findings based on multiple regression analysis were that stakeholder's participation possess a strong, positive and statistically substantial link with projects completion given a coefficient correlation (R) of 0.849 and a P-Value of 0.000 less than 0.5 alpha. In addition, combined stakeholder participation accounted for 71.5% variation in the dependent variable thereby, recommending design of approaches for involving stakeholders in entire phase of project lifecycle.

Encouraging community participation in all phases of the project is very vital. According to Hassan, Ong'ayo and Osore (2019), participation of the community reduced dependency on outside agencies and stimulates local self-reliance. Alelah and Mueke (2017) warn that efforts by various stakeholders in upgrading the slum projects provide little importance if they can halt after a particular time period. Their study targeted a population of 296 households in Rhonda slum in Nakuru County in Kenya and through descriptive and inferential analysis, with correlation values of ($r=0.671$, $p < 0.05$), the study found a substantial positive link between beneficiaries' involvement and WASH project sustainability. The study proposed that at every step of development, the community be considered prior to implementation of projects. According to Chifamba (2013) research in Zimbabwe, community influence or control over organizations in which beneficiaries' involvement is generally low, attributed to the fact that services are typically controlled by individuals who are neither poor nor service recipients. According to the study, community members were engaging in an empty ritual of involvement. As a result, community participation in slum upgrading should be employed to improve and maintain slum dwellers' quality of life (Hasanawi, Masturi & Hasanawi, 2019). The community's role in slum upgrading intervention planning, prioritization, design, implementation, monitoring, and maintenance is frequently to convey their requirements as well as solutions that are most suited to the local circumstances (UN-Habitat, 2016). In addition, it is also worth noting that poor community participation can result in protest and resistance by locals (Geest & Nys-Ketls, 2019).

A descriptive study by Lelegwe (2015) observed that community participation was inadequate and that donor funded initiatives need to encourage participation of beneficiaries in entire project implementation phases. However, the research failed to measure the association and strength of variables and therefore the findings could not be inferred to entire population thus creating a gap to be filled by the current study. This study resonates with a study by Mbui and Wanjohi (2018) through the correlation analysis that, community participation in performance of local projects is still weak. The findings revealed that participation of community in terms of governance, funds management, operations and M&E is moderately observed. Noori (2017) looked into the impact of beneficiary involvement practices like participatory need assessment, planning and design, implementation, and M&E on the long-term viability of the National Solidarity Program's development projects in Afghanistan. The study used a quantitative approach with a sample size of 250 people attained via proportional random sampling from the target demographic. According to Noori (2017), beneficiaries' involvement in all stages of development projects which

accounted for 53.7 percent, is critical to guaranteeing project sustainability. There is concurrence in these studies that community projects do not involve the participation in all phases of the project as required.

Communication is a pillar to facilitate community participation in development projects during project inspection. The obstacles impacting engagement of beneficiaries to partake in District Education Strategic Planning (DESP) process were evaluated by Takyi, Anin, and Asuo (2014). In-depth interviews were employed to obtain primary data, which was then analyzed qualitatively utilizing a suppositions and inference approach. From the findings, District Assembly Officers and District Education Officers believe that lack of funds or resources, difficult terrain, and a lukewarm attitude among local beneficiaries are the main obstacles preventing locals from participating in DESP process. Poor communication between the developers and stakeholders was also blamed by local community stakeholders for their non-participation in the DESP process. This therefore calls for open channels of communication to ensure maximum participation of community members in the whole life cycle of a project. The study by Ndegwa, Mavole and Muhingi (2017), although conducted on health projects, recommended that beneficiaries be involved more often in all stages of public project to guarantee that all objectives are satisfied and at the same time are accepted by the users who are residents of that region. Similarly, Lungo, Mavole and Martin (2017) employed a descriptive research design and sampled 96 participants using random sampling on households and purposive technique on key informants to study the determining factor of project sustainability on donor supported project in Zambia. The findings indicated that there was poor engagement of beneficiaries in that most of households took part in implementation more than planning phase and decision making. Based on the findings, the researchers recommended that development stakeholders need to ensure that communities partake in all phases of project formulation and implementation.

While there is concurrence by various scholars that participation by community in the project lifecycle management is crucial for completion of slum upgrading programs, there is minimal discussion on what hinders or limits effective community participation in the programs. This study identifies stakeholder involvement as an enabler and moderator for project management lifecycle activities where community participation is considered extremely important for successful completion as well as sustainability of slum upgrading programs. The findings from Mongina and Moronge (2021) found that the association between using multiple project management approaches and the performance of construction projects, particularly road projects in Nairobi County, resulted in the combined predictor variable explaining 77.20% of the performance. This suggests that incorporating project management methods is necessary to enhance the project performance. The study found that management techniques or activities had a positive and substantial correlation with the dependent variable. The study indicated that project planning had the most significant impact inside the multivariate model, followed by project monitoring and evaluation, project funding, and project risk management. The authors did not thoroughly address all stages of the project lifecycle unlike the current study, which includes initiation, implementation, and closure, as well as project funding and risk management. Muute and James (2019) suggest that project management activities emphasizing predictors such as time management, material planning, human resource planning, and financial resource planning have a favourable and significant impact on the performance of construction projects. The study was guided by empowerment theory.

2.2 Theoretical Framework: Empowerment Theory

The empowerment theory by Kanter (1993) was also applicable for this study. Based on this theory, one of the key progressive tools for sustainability at the community level is the community-based interventions (Zimmerman, 1995). The theory justifies the significance of creating collaborative capacities, building capacities at the grassroots or the community level and also being able to initiate change at a local level. The theory argues that through coalitions at the community level, members are empowered to effectively collaborate for building of social capital that provides solutions to emerging issues (Fawcett *et al.*, 1995).

The theory provides an understanding of the issues faced by human beings in context of economic, political and social surroundings. Empowerment arises in a community where members have access to information, support and the required resources. Community members that are empowered are believed to be more accountable for what they do, more committed to the project organization and feel okay to contribute towards project interventions (Degner, 2005). Erickson *et al.* (2003) hold that empowerment occurs when individuals gain control on their lives while taking part in the decisions that would impact on their lives in the community where they belong. This theory aligns well to the entire project life cycle with the reasoning that when the members of the community are empowered with knowledge, power and skills, they can be able to participate and interact with the secondary stakeholders in key decision-making process for the performance of slum upgrading initiatives

2.3 Conceptual Framework

The conceptual framework adopted in this study presents the relationship between the independent variable (IV) and dependent variable (DV). Thus, the independent variable was project management lifecycle (PMLC) and the dependent variable being performance of slums upgrading projects. Figure 1 illustrates this relationship in detail.

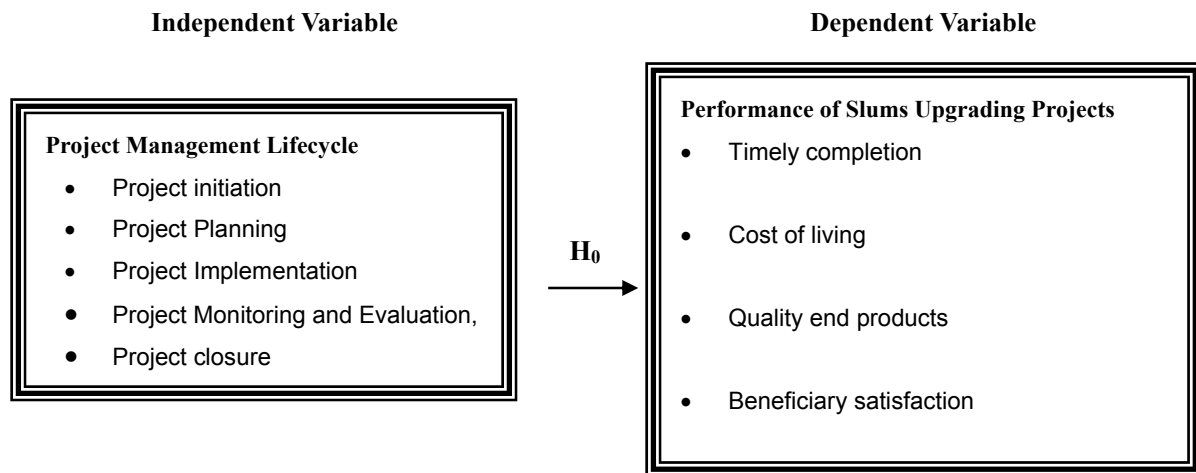


Figure 1. Conceptual framework

3. Methodology

The study was guided by pragmatism whereby both positivism and constructivism are adopted. Correlational research design and descriptive survey research designs were considered appropriate for the former supported inferential statistics while the latter was found ideal for collecting quantitative and qualitative data simultaneously. The target population for this study was 794 comprising of 126 Nairobi People Settlement Network (NPSN), 18 Settlement Executive Committees (SECs), 60 project staff members of both KENSUP and KISIP projects and finally 590 community representatives from the Nyumba Kumi of Kibera, Huruma, Mathare, Korogocho, Mukuru and Kawangware slums in Nairobi County. Nyumba Kumi is a Swahili word that refers to a house or a household whereby 10-households are put together under one leadership for ease of monitoring individual activities for the sake of peace maintenance and participation in socio-economic development activities. NPSN is a social movement, a cooperative national umbrella organization that incorporates Youth groups, Self-help groups, faith-based institutions, women's groups, non-formal educational institutions, orphans' organizations and hawkers, with the current membership for Nairobi being 126 groups (Otieno, 2019). Several evictions in Mombasa, Nairobi and Kisumu among other cities sparked the formation of the network in early 1990s and 2000.

The unit of analysis were the slum improvement projects in Nairobi City County. They cut across housing, roads, water, sanitation and hygiene. The study sample was 266 calculated using Yamane (1967) formula which is represented by population size and 0.05 as the tolerable margin error of 0.05. The target population and sample size are tabulated in Table 1.

Table 1. Sampling procedure

No.	Category of respondents	Stratified Population to be Sampled (N)	Proportionate Sample Size (n)
1	Nairobi People Settlement Network (NPSN)	126	42
2	Settlement Executive Committees	18	6
3	KENSUP Project staff	34	11
4	KISIP Project staff	26	9
5	Kibera Nyumba Kumi Community Members	140	47
6	Huruma Nyumba Kumi Community Members	60	20
7	Mathare Nyumba Kumi Community Members	130	44
8	Korogocho Nyumba Kumi Community Members	80	27
9	Mukuru Nyumba Kumi Community Members	90	30
10	Kawangware Nyumba Kumi Community Members	90	30
Total		794	266

Proportionate sampling technique (Table 1) was used to divide the sample size across all the strata proportionately as this would assist in maximizing sample survey precision from the calculated sample size. However, during data collection, simple random sampling technique was used to ensure each element in every stratum has an equal chance of participating in the study (Kothari, 2004; Sekaran, 2006); and thus, offers a fair chance of distributing research instruments or interview schedules to the study participants. Sekaran (2003) states that, a sample greater than 30 subjects or participants is suitable for carrying out statistical analysis. Singh and Masuku (2014) state that the sampling techniques used and determination of sample size are important in applied research to enable one draw free-from-errors conclusions. Analysis of descriptive data was based on means and standard deviations to measure central tendency and dispersion respectively. Inferential analysis was performed using stepwise multiple linear regression using Baron and Kenny (1986).

3.2 Test for Multicollinearity for the Variables

Multicollinearity test was conducted to satisfy the assumption of conducting multiple regression analysis (Hair, Black, Babin and Anderson (2010). Multicollinearity normally occurs when two or more predictors correlate in a model and tend to provide redundant information about the response (Asteriou & Hall, 2007; Hair *et al.*, 2010), caused by inter-correlation among the explanatory variables. When predictors are linearly related it becomes problematic to build a regression model between response variable Y and explanatory variable X (Alin, 2010). To be able to detect presence of multicollinearity, this study employed correlation coefficients (correlation matrix) and Variance Inflation Factors (VIFs). It should be noted that VIF values that exceed 10 are a pointer to significant multicollinearity (Field, 2013; Somekh & Lewin, 2005). According to Hair, *et al.* (2010), if VIF value exceeds 4.0 and the collinearity statistics tolerance values are less than 0.2 then it is likely there is a multicollinearity problem. The results were as shown in Table 2.

Table 2. Test for Multicollinearity

Model	Collinearity Statistics	
	Tolerance	VIF
(Constant)		
Project Initiation	0.315	2.988
Project Planning	0.276	3.624
Project Implementation	0.178	5.620
Project M&E	0.254	3.941
Project Closure	0.133	7.499

a. Dependent Variable: PSUP

From Table 2, all the variance inflation factor (VIF) values were below 10. The lowest tolerance value was 0.133 and the highest 0.335 which implies that data did not have serious multicollinearity issues.

4. Results and Findings

4.1 Questionnaire Return Rate

Questionnaires were distributed to KENSUP and KISIP officers whereas responses from the community members were collected using interview schedules. Questionnaire returned were recorded in Table 3.

Table 3. Response return rate

Category of Respondents	Sample Size	Returned	Average Return Rate (%)
Nairobi People Settlement Network	42	23	8.65
Settlement Executive Committees	6	6	2.26
KENSUP & KISIP Officers	20	20	7.52
Nyumba Kumi Community Members	198	159	59.77
Total	266	208	78.20

In Table 3, questionnaires not returned were 58, representing 21.8%. Saunders, Lewis, and Thornhill (2009) hold that, a study with 50% return rate is sufficient for carrying out inferential analysis. According to Mugenda and Mugenda (2003), 70% response rate is good for inferential analysis; for this study, 78.20% was achieved.

4.2 Descriptive Analysis of Study Variables

4.2.1 Descriptive Analysis of Performance of Slums Upgrading Projects

Data was collected on performance of slum upgrading projects (PSUP) using the questionnaire by asking the respondents to indicate their level of agreement or disagreement with statements generated based on four outcome variables: Timely completion, affordable services, quality of end products and beneficiary satisfaction. The statements were measured using a 5-point Likert scale ranging from 5 = To a Very Great Extent, 4 = To a Great Extent, 3 = To a Moderate Extent, 2 = To a Small Extent and 1 = Not at all. The findings are presented in Table 4.

Table 4. Descriptive analysis of performance of slum upgrading projects

Statement	NAA F (%)	TSE F (%)	TME F (%)	TGE F (%)	TVGA F (%)	Mean	Std. Dev.	Total F (%)
Timely Completion								
PSUP-01 Projects are completed on time as planned	91 (43.8%)	53 (25.5%)	31 (14.9%)	9 (4.3%)	24 (11.5%)	2.14	1.336	208 (100)
PSUP-02 Projects timelines adhere to critical path	75 (36.1%)	79 (38.0%)	29 (13.9%)	14 (6.7%)	11 (5.3%)	2.07	1.116	208 (100)
PSUP-03 Adjustments to BoQs have no effect on completion timeliness.	77 (37.0%)	50 (24.0%)	37 (17.8%)	18 (8.7%)	26 (12.5%)	2.36	1.379	208 (100)
Sub-Composite mean and standard deviation						2.19	1.277	
Affordable Services								
PSUP-04 Prices have reduced for most of the available goods and services.	110 (52.9%)	42 (20.2%)	24 (11.5%)	20 (9.6%)	12 (5.8%)	1.95	1.246	208 (100)
PSUP-05 Community members can afford to raise required fees for some of the projects (houses, water bills, hospitals, business stalls).	98 (47.1%)	58 (27.9%)	24 (11.5%)	13 (6.3%)	15 (7.2%)	1.99	1.222	208 (100)
PSUP-06 Cost of starting business is eased.	68 (32.7%)	52 (25.0%)	31 (14.9%)	31 (14.9%)	26 (12.5%)	2.50	1.400	208 (100)
Sub-Composite mean and standard deviation						2.15	1.289	
Quality of End-Products								
PSUP-07 Minimum repair works are needed on the completed projects.	66 (31.7%)	52 (25.0%)	37 (17.8%)	20 (9.6%)	33 (15.9%)	2.53	1.428	208 (100)
PSUP-08 Social amenities were considered (playgrounds, social halls).	93 (44.7%)	53 (25.5%)	25 (12.0%)	18 (8.7%)	19 (9.1%)	2.12	1.315	208 (100)
PSUP-09 The completed projects have sufficient space to accommodate the present population.	94 (45.2%)	60 (28.8%)	31 (14.9%)	10 (4.8%)	13 (6.3%)	1.98	1.167	208 (100)
Sub-Composite mean and standard deviation						2.21	1.303	
Beneficiary Satisfaction								
PSUP-10 Security of tenure is improved.	66 (31.7%)	64 (30.8%)	38 (18.3%)	21 (10.1%)	19 (9.1%)	2.34	1.272	208 (100)
PSUP-11 Compensation and resettlement were fairly carried out.	106 (51.1%)	39 (18.8%)	24 (11.5%)	23 (11.1%)	16 (7.7%)	2.06	1.328	208 (100)
PSUP-12 Families co-exist harmoniously (social fabric sustained)	54 (26.0%)	62 (29.8%)	47 (22.6%)	15 (7.2%)	30 (14.4%)	2.54	1.336	208 (100)
Sub-Composite and standard deviation						2.31	1.312	
Composite mean and Standard deviation						2.22	1.295	

Table 4 presents analysis of project performance. A composite mean and standard deviation were computed whereby a line item mean and standard deviation were used for comparison. A line item mean higher than the

composite mean, implied the item had a positive influence and vice versa. This also applied to the interpretation of results on standard deviation and composite standard deviation. Where standard deviation (SD) for the line item is below is less than the composite then the respondents' opinions converged or were consistent and when above or greater the opinions diverged or were inconsistent.

Statement PSUP-01, on whether projects are completed on time as planned, majority of the respondents indicated that this was not being achieved. The statement had a line item mean of 2.14 lower than the composite mean of 2.22 implying that timely completion as a key performance indicator (KPI) remains a challenge in many slum upgrading projects. Opinions on this statement were divergent (A line $SD=1.336 > \text{composite } SD=1.295$). The finding contradicts Muute and James (2019) study whose finding showed that majority of the respondents strongly agreed that project completion was done without struggle in construction projects. Interview with KENSUP and KISIP project staff revealed that, *“delay in disbursement of funds, litigations and community protests affect time within which projects are supposed to be completed.”*

Statement PSUP-02, projects timelines adhere to critical path, responses indicate that critical path is disregarded. This is further supported with a mean of 2.07 slightly below 2.22 the composite mean implying that slum upgrading projects do not follow the outlined critical path to expedite completion rate as far as project performance is concerned. In terms of variability, opinions were convergent (A line $SD=1.116 < \text{composite } SD=1.295$). Atin and Lubis (2019) stated that the use of critical path method (CPM) is useful in scheduling project activities to determine which ones will start, postponed and completed. Focused group discussion (FGD) attributed failure to adhere to critical path because of, *“poor coordination of planned activities, exclusion of key stakeholders' views, and corruption in procurement processes.”*

Statement PSUP-03, adjustments to BoQs have no effect on completion timelines. Recorded was a mean of 2.36 slightly above 2.22 the composite mean which implies that adjustment done to BoQs did not affect completion time thus a positive influence on slum upgrading projects. In terms of variability, opinions were divergent (A line $SD=1.379 > \text{composite } SD=1.295$). Razali *et al.* (2016) opine that at times contractors fail to comply with contents in the Bill of Quantities (BOQs). In view of the KENSUP officials, *“project feasibility and design are well planned before construction is rolled out full.”*

Statement PSUP-04, prices have reduced for most of the available goods and services. A line mean of 1.95 slightly below 2.22 composite mean was recorded which implies that slum upgrading projects have not lowered the cost of living or affordability of services to people. In terms of variability, opinions were convergent (A line $SD=1.246 < \text{composite } SD=1.295$). Bah *et al.* (2018) noted that the costs of delivering projects delivering, either under private or government support must be recovered and this puts pressure on the cost of living or available goods and services for consumers. Results of FGD with members of the Korogocho, Kawangware and Mathare slums revealed that, *“most of the slums upgrading projects implemented in our informal settlements end up making life more difficult because those who benefit mostly are the middle class and high level salary earners. Tenants still live at the mercies of the capitalistic system.”*

Statement PSUP-05, community members can afford to raise required fees for some of the projects such as houses, water bills, hospitals and business stalls. A line mean of 1.99 slightly below 2.22 composite mean implies that projects completed for slum upgrading are affordable. In terms of variability, opinions were convergent (A line $SD=1.222 < \text{composite } SD=1.295$). Bah *et al.* (2018) observed that majority of the slum dwellers sometimes cannot afford to raise required fee on basic commodities and services including water and electricity and thus resort to illegal connections. That cost of slum upgrading must be recovered and way in which it is done by either the government or the private sector, community members or primary beneficiaries cannot afford. Results of FGD with members of the Mukuru and Kibera slums revealed that, *“life becomes more expensive as upgrading of slums is done. Ordinary commodities become cumbersome in terms of market pricing and services like water and electricity become so expensive. These services are normally sub-let before new infrastructure development; but when we have proper new development members of the community are forced to engage in illegal connections which are criminal in nature.”*

Statement PSUP-06, cost of starting business is eased. A line mean of 2.50 slightly above 2.22 composite mean implies that starting business in the upgraded slums is made easier because of the improved infrastructure. In terms of variability, opinions were divergent (A line $SD=1.400 > \text{composite } SD=1.295$). This finding resonates with the study finding of Mesplé-Somps, Pasquier-Doumer and Guénard (2021) that showed that self-employed activities develop more particularly in places adjacent to the completed projects such as roads. Results of FGD with community members in all the slums and project implementing teams, KENSUP and KISIP, revealed that, *“small*

scale businesses have sprouted in the neighbourhood particularly along the road corridors where infrastructure is improved. That is, access to water and electricity have played major role besides road construction in the slums.”

Statement PSUP-07, minimum repair works are needed on the completed projects. A line mean of 2.53 slightly above 2.22 composite mean implies that completed projects in the slums meet mark of quality. This could be associated with the right use materials both in terms of quality and quantity. In terms of variability, opinions were divergent (A line SD=1.428>composite SD=1.295). This finding resonates with past studies that agree that proper use of resources in projects is vital to achieve quality (Balaji & Venugopal, 2017; Priyadharsan & Raja, 2020). Results of FGD with KENSUP and KISIP, revealed that, *“the client works with the qualified consultants to deliver quality end products. The Contractor is regularly supervised to ensure the materials used will provide long term durable projects that will serve the community with minimal repair works needed.”*

Statement PSUP-08, social amenities were considered (playground, social halls). A line mean of 2.12 slightly below 2.22 composite mean implies that most of the completed projects in slums do not have provision for community playgrounds and social halls as part of social amenities thus need to factor this in future slum upgrading plans. In terms of variability, opinions were divergent (A line SD=1.315>composite SD=1.295). Bah *et al* (2018) hold that social amenities should be add-ons during slum upgrading. Results of FGD with KENSUP and KISIP, agree with that, *“Land is diminishing in most of our cities and especially Nairobi County thus the ongoing construction activities in slum dwellings leave little space for social amenities.”* In addition to this, the FGD in Kibera said that, *“Slum upgrading is a great idea but social amenities are lacking yet we still need them.”*

Statement PSUP-09, the completed projects have sufficient space to accommodate the present population. A line mean of 2.12 slightly below 2.22 composite mean implies that projects have no sufficient space to meet the needs of the present. In terms of variability, opinions were convergent (A line SD=1.167<composite SD=1.295). While it is well noted by UN HABITAT (2013) that slums lack adequate space, Sommer (2013) recommended that developers should consider securing public space and common space in slums by designating 10% for recreation, community space, services and facilities. Results of FGD with KENSUP and KISIP, agree with that, *“Land is diminishing in most of our cities and especially Nairobi County thus the ongoing construction activities in slum dwellings leaves little space for social amenities.”* In addition to this, the FGD in Kibera said that, *“Slum upgrading is a great idea but social amenities are lacking yet we still need them. Land is privately owned and cost of compensation affects space acquired for development.”*

Statement PSUP-10, security of tenure is improved. A line mean of 2.34 slightly above 2.22 composite mean which implies that slum dwellers enjoy security of tenure even after new development of infrastructure. In terms of variability, opinions were convergent (A line SD=1.272<composite SD=1.295). Security of tenure is encouraged and promoted as one way of improving livelihoods of the slum dwellers (Teferi & Newman, 2017; Miltra *et al.*, 2017 Cordaid, 2004; UN-Habitat, 2000b). From a FGD with KENSUP and KISIP, it was established that, *“The government has a clear process of ensuring that the original inhabitants of the slums are granted the first priority to occupy the houses, own market stalls and no none is evicted against their will.”* FGD in Kibera with community members affirmed that, *“All land owners and members of community who have lived in slums for decades are consulted and waived when it comes to paying for some of the facilities completed and rightfully and equitably distributed.”*

Statement PSUP-11, compensation and resettlement were fairly carried out. A line mean of 2.06 slightly below 2.22 composite mean which implies that compensation and resettlement process was flawed. In terms of variability, opinions were divergent (A line SD=1.328>composite SD=1.295). The results resonate with Langat (2019) who noted that part of problem faced by slum dwellers was unfair compensation and consideration in distribution or allocation of new houses, business premises (Langat, 2019). From a FGD with KENSUP and KISIP, it was established that, *“Most of the slum dwellers are not able to produce the right documentation as far as land ownership is concerned and this thwart effort of carrying out efficient and effective resettlement and compensation.”* FGD’s findings from Korogocho, Kawangware, Huruma, Mathare, and Kibera and with NPSN community members who lamented about resettlement process and compensation outlined that, *“Most of the community members are just squatters and whereas some own pieces of land, they have no proper documents as proof. It was hoped that the government that would be considering this fact although through the nyumba kumi and Nairobi People Settlement Network, those who have dwelt in slums for many years got a fair hearing.”*

Statement PSUP-12, families co-exist harmoniously (social fabric sustained). A line mean of 2.54 slightly above 2.22 composite mean which implies that families in the slum still enjoy social fabrics which could be attributed to proper baseline survey that identified community needs and incorporated in projects development. In terms of variability, opinions were divergent (A line SD=1.336>composite SD=1.295). Community pride and social

cohesion are one among the social determinants of health (SDOH) that shape health outcomes outside the medical care factors (Corburn & Sverdlik, 2017). Results partly agree with the findings Miltra *et al.* (2017) who found that unlike the railway project for residents who were relocated to Magade, KENSUP project disrupted the social cohesion between the Kibera residents and the middle class in Lang'ata area. Yeboah *et al.* (2021) who found that slum upgrading programs concentrate mainly on the physical projects with minimal focus on identifying and incorporating the diverse needs of residents.

From a FGD with KENSUP and KISIP, it was established that, “*Project sociologists are involved in the early stages to carry out baseline survey with the findings helping in planning and implementation of the projects to ensure community needs and social fabrics are not ignored in the whole plan or design.*” FGD’s findings with NPSN, Mathare and Kibera with community members who lamented about resettlement process and compensation outlined that, “*Most of the community members are just squatters and whereas some own pieces of land, they have no proper documents as proof. It was hoped that the government that would be considering this fact although through the nyumba kumi and Nairobi People Settlement Network, those who have dwelt in slums for many years got a fair hearing.*” In addition, the Kibera community members said that, “*there was a challenge when the demolition exercise was carried out and people forced to relocate to parts of Lang'ata. This exerts so much pressure on accessing social amenities and some household commodities at affordable prices. The residents in Lang'ata also treated us with distain and mistrust because of where we had lived for years.*”

4.2.2 Descriptive Analysis of Project Management Lifecycle

The respondents were asked to, in a scale of 1-5, score various statements relating to specific indicators of Project Management Life Cycle (PMLC). The statements were measured using a 5-point Likert scale ranging from 5 = To a Very Great Extent, 4 = To a Great Extent, 3 = To a Moderate Extent, 2 = To a Small Extent and 1= Not at all. The results are shown in Table 5.

Table 5. Descriptive analysis of project management life cycle

CODE	Variable Dimension and indicators	Mean	Std Dev
		(M)	
A	Project Initiation		
A1	Stakeholder Identification	2.45	1.481
A2	Community Needs Assessment	2.42	1.410
A3	Project Conceptualization	2.56	1.384
A4	Setting Project Deliverables	2.48	1.244
	Sub-Composite Mean & Std Dev	2.48	1.380
B	Project Planning		
B1	Relocation of households	1.88	1.180
B2	Resource Planning	1.96	1.218
B3	Project Timeframes	2.02	1.294
B4	Project Scope	1.97	1.255
	Sub-Composite Mean & Std Dev	1.96	1.237
C	Project implementation		
C1	Grievance Redress Mechanism	2.15	1.262
C2	Execution of Planned Activities	2.11	1.258
C3	Actual Construction	2.35	1.270
C4	Management of Project Activities	2.25	1.369
	Sub-Composite Mean & Std Dev	2.22	1.290
D	Project Monitoring and Evaluation		
D1	Selection of Reporting Tools	2.12	1.235
D2	Project Control	2.09	1.273
D3	M&E Training	1.98	1.333
D4	Tracking of Project Progress	2.06	1.373
	Sub-Composite Mean & Std Dev	2.06	1.304

CODE	Variable Dimension and indicators	Mean (M)	Std Dev
E	Project Closure		
E1	Project Inspection	2.06	1.253
E2	Final Report Development	2.01	1.279
E3	Handover of Project	2.03	1.258
E4	Exchange of Lessons Learned	1.99	1.314
	Sub-Composite Mean & Std Dev	2.03	1.276
PMLC	Composite mean and standard deviation	2.15	1.297

The result of the composite mean for project management life cycle is 2.15 (Table 5). Project initiation (coded A), (M=2.48>M=2.15) and project implementation (Coded C), (M=2.22>M=2.15) had a greater mean compared to the composite mean. This implies that project initiation and project implementation phases have great influence in the whole project life cycle and are well paid attention to thus positive change and overall performance of slum projects. Opinions on project initiation and project implementation variables were divergent and convergent respectively.

Project planning (Coded B), (M=1.96<M=2.15), project M&E (Coded D), (M=2.06<M=2.15) and project closure (Coded E), (M=2.03<M=2.15) show an average influence on performance of slum projects. The results also imply that activities planned in these three phases of the cycle are to a small extent carried out thus a possible negative influence on the overall performance. The results also reveal that, planning phase (SD=1.237>SD=1.304) and closure phase (SD=1.276>SD=1.304) recorded convergence of opinions; divergent opinions were recorded on project M&E phase (SD=1.304>SD=1.297).

4.3 Inferential Analysis

4.3.1 Correlation Analysis of Project Management Lifecycle and Performance of Slums Upgrading Projects

Correlation analysis using Pearson’s Product Moment technique was done to establish the relationship between the various dimensions of project management lifecycle and performance of slums projects. The values obtained from the correlational analysis ranged between +1 and -1. In this regard, +1 implied perfect positive correlation, while -1 implied perfect negative correlation. 0.000 implied no correlation; the modular values 0.001 to 0.250 implied weak correlation; 0.251 to 0.500 implied semi-strong correlation; 0.501 to 0.750 implied strong correlation; and 0.751 to 1.000 implied very strong correlation. The findings were as shown in Table 6.

Table 6. Correlation matrix for project management lifecycle and performance of slums upgrading projects

<i>Correlations</i>			
Variables		PSUP	Project management life cycle
PSUP	Pearson Correlation	1	0.799**
	Sig. (2-tailed)		0.000
	n	208	208
Project management life cycle	Pearson Correlation	0.799**	1
	Sig. (2-tailed)	0.000	
	n	208	208

****Correlation is significant at 0.05 level of significant (2-tailed)**

The correlation analysis results (Table 6) show linearly positive and very strong significant relationship between project management life cycle (PMLC) and PSUP (r=0.799, p=0.000<0.05). The finding support Njeru and Kimutai whose study on participatory project management and success of slum upgrading projects in Korogocho informal settlements Nairobi City County adopted project identification, planning, implementation and M&E in a multivariate analysis and showed a strong and significant linear relationship with the project performance. The findings further support study findings from Mongina and Moronge (2021) and Matu *et al.* (2020) studies who opine that project management life cycle has great influence and relationship with project performance

($p=000<0.05$). Both of these studies were conducted in roads while the current study focused on all projects aimed at changing the face of slums in Nairobi County. This implies that adhering to all phases in project lifecycle is vital for good performance in execution of slums improvement projects.

4.3.2 Regression Analysis of Project Management Lifecycle and Performance of Slums Upgrading

Projects

Test of Hypothesis

The following hypotheses were tested using linear regression model to satisfy the requirements of the objective of the study:

H₀: project management life cycle has no significant relationship with performance of slum upgrading projects.

H₁: project management life cycle has significant relationship with performance of slum upgrading projects.

Regression Model

The mathematical model used for testing the null hypothesis was as follows:

PSUP = f (project initiation, project planning, project implementation, project M&E and project closure)

$Y = f(X_1, X_2, X_3, X_4, X_5 \varepsilon)$

$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \varepsilon$

Where $Y = \text{PSUP}$

$X_1 = \text{project initiation}$

$X_2 = \text{Project planning}$

$X_3 = \text{project implementation}$

$X_4 = \text{project M\&E}$

$X_5 = \text{project closure}$

$\beta_0 = \text{Constant term}$

$\beta_1, \beta_2, \beta_3, \beta_4 \text{ and } \beta_5 = \text{Beta coefficients}$

$\varepsilon = \text{Error term}$

Data was analyzed and the regression results for the influence of project management life cycle on PSUP as presented in Table 7.

Table 7. Regression of project management lifecycle and performance of slums upgrading projects

Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	0.799 ^a	0.638	0.629	0.47154		
ANOVA						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	79.049	5	15.810	71.103	0.000 ^b
	Residual	44.915	202	0.222		
	Total	123.964	207			
Regression Coefficients						
Model		Unstandardized Coefficients			T	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.746	0.094		7.968	0.000
	Project initiation	0.602	0.057	0.777	10.616	0.000
	Project planning	0.178	0.071	0.197	2.500	0.013
	Project implementation	-0.167	0.079	-0.207	-2.117	0.035
	Project M&E	-0.139	0.068	-0.172	-2.053	0.041
	Project closure	0.141	0.079	0.184	1.781	0.076
	Predictors: (constant), project initiation, project planning, project implementation, project M&E and project closure					
Dependent Variable: PSUP						

Table 7 shows that the adjusted $R^2 = 0.629$, therefore this means that variation in PSUP is explained by project management lifecycle (PMLC) at 62.9%. This finding is line with Noori (2017) who found that project life cycle influences performance of development projects in Afghanistan by 53.7% thus, the need to execute all activities in the phases and also require everyone to participate in the whole project cycle.

The results also indicate that project initiation and project planning phases of PMLC are good predictors and significantly predict the overall performance in the outcome variable (PSUP). That a for a unit increase in project initiation and project planning, PSUP increases by 7.77% and 1.97% respectively whereas for a unit decrease in project implementation and project M&E, PSUP decreases by 2.07% and 1.72% respectively. While it is recorded that project closure predicts change in PSUP by 1.84%, this change is insignificant given that its p-value is greater than alpha ($p=0.076>0.05$).

Using the statistical findings in Table 5, the regression model can be substituted as follows:

$$Y = 0 + -0.073X_1 + 0.450X_2 + 0.353X_3 + 0.033X_4, \text{ hence}$$

$$Y = -0.073X_1 + 0.450X_2 + 0.353X_3 + 0.033X_4$$

Where; X_1 = project initiation

X_2 = project planning

X_3 = project implementation

X_4 = Project M&E

X_5 = Project closure

It should be noted that when standardized beta values are used in a multiple regression model, the constant (β_0) does not apply unless it is in simple linear regression where unstandardized B coefficients values apply. The overall F statistics, $F(5,202) = 71.103$ is greater than the critical value of 2.259 hence the goodness fit of the model was established. The model is significant a ($p=0.000<0.05$) which implies that there exists a statistically significant relationship between PMLC and PSUP. In this respect, we fail to accept the null hypothesis and conclude that project management life cycle has greater influence on performance of slum upgrading projects.

5. Knowledge Contribution

Although project management life cycle involves five phases considered by this study vital to the performance of slum upgrading projects, it is worth noting that project initiation, project planning and project closure have been proved to have strong significant influence on performance of the projects. On the other hand, project implementation and project monitoring and evaluation have shown less significance and less predicting effect on project performance. This scenario may arise when activities outlined during initiation stage and planned well in the second phase are not accorded proper attention during implementation and project M&E phases. This ultimately negatively impacts the overall project outcomes. The findings reaffirm calls by project management body of knowledge (PMBOK) theorists that implementation and monitoring and evaluation of projects require maximum attention to realize quality end products. The study also contributes to existing knowledge in academia by providing insights on project management.

6. Conclusion

From the study findings, it may be concluded that project initiation and project implementation were carried out in the project as expected thus a positive influence. On the other hand, project planning, project M&E and project closure phases need to be checked and issues noted ought to be addressed for optimum performance. It also concluded that project management lifecycle accounted for 62.9% total variation in performance of the projects. In general, the null hypothesis was rejected and concluded that Project Management Lifecycle significantly influences Performance of Slum Upgrading Projects.

Conflict of interest

Authors declare there are no conflicts of interest. This article is part of the PhD thesis.

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Authors contributions

The authors' contribution was as follows: Janet Ombwayo is the principal investigator who conceptualized the study, led in review of literature, data collection, analysis, interpretation of results and discussion. Prof. Harriet Kidombo and Prof. Christopher Gakuu guided in selecting the study variables, review of the proposal and final work. They also assisted in aligning the manuscript. All authors read and approved the final manuscript. They all contributed to the quality of the final manuscript.

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