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Applicability of public-private partnerships in the development of affordable urban housing in Kenya

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The Constitution of Kenya 2010, Kenya Vision 2030, and many international commitments that Kenya is party to obligate the government to deliver decent, affordable, accessible, and quality housing for all Kenyans. Since independence, many strategies to fast-track housing development have been explored with mixed results. The annual housing demand stands at 250,000 units, with only 50,000 being developed through public and private means, hence a deficit of 200,000 units. Application of public-private partnerships (PPPs) models has been projected as the most appropriate strategy through which affordable housing can be availed in the country. PPPs address the problems related to inadequate capital, expertise, managerial, and technological applications that hinder the effective development of affordable urban housing. The study's main focus was to evaluate the applicability of PPPs in the development of affordable urban housing. The study used the Delphi methodology of investigation, which uses iteration and building consensus to arrive at group decisions. Three Delphi rounds that involved 88 persons in three panels comprised of housing practitioners, housing financiers, and developers. It was found out during the first round that 95.5% of the panelists observed that PPPs can be utilized in the development of affordable urban housing, and 4.5% stated that they believed that PPPs may be inappropriate for the sector. It was also found out that configuring and positioning public and private players' concerns regarding PPP models increases its applicability in the development of affordable urban housing. The main conclusion from the study is that PPP models are appropriate for the development of affordable urban housing.

Keywords: affordable housing, Delphi, iterations, public-private partnerships, public sector, private entities

Introduction

The ability to own a home through rental, self-construction or purchase is an essential pursuit that households have struggled with all over the world. At the same time, the public sector allocates substantial amounts of money to addressing shelter needs, though challenges abound. Under-development of affordable housing across the world has led to the proliferation of slums and informal settlements. Kenya, like other developing countries, has over 500 slums and informal settlements that have diverse infrastructural and land tenure needs.

Attempts have been made to address the housing challenge, including the promotion of research, the application of alternative building materials, and leveraging on the private sector to complement efforts by the public sector in housing provision (Republic of Kenya, 2004). This reality is reflected in many international treaties and constitutions, which have made housing a fundamental human right.

The Constitution of Kenya, 2010, enshrines this right in the bill of rights as captured in Article 43 1(b) of the Constitution (Republic of Kenya, 2010; Tibaijuka, 2010; Mungai, 2011; Auko, 2012; Ojwang', 2015). The growth of urban areas, increases in the national population, increased rates of poverty, increased costs of housing development in terms of materials and labor and related processes have affected the pace of the development of affordable housing.

This is the case for developing countries like Kenya (Republic of Kenya, 2009, 2018; UN-Habitat, 2016).

Efforts and strategies have been directed toward the development and utilization of innovative methods and approaches through which the housing supply gaps and challenges can be addressed. These strategies include resorting to privatization, liberalization, and the application of PPP models, with PPPs emerging as one of the best options under the current circumstances.

This is because the model operationalizes mechanisms through which housing development projects can realize better value for money, unlike the traditional procurement methods that may occasion low value for money transactions (Sanda et al., 2017). The greater motivation for the use of PPPs in housing development is anchored on the fact that other sectors of the Kenyan economy, like transport, energy, and water, have successfully utilized the model.

Under PPP arrangements, the public sector leverages its assets, laws, limited financing, project specifications, monitoring, and evaluation skills to ensure high-quality housing products are developed. However, the private sector taps on its advanced financial resource mobilization, technology, and innovation capabilities to achieve the expected affordable housing projects [(1, 2); Ong'olo et al., 2006; Gandhinagar, 2015; Mohamed, 2017].

This study sought to explore the appropriateness of PPP models in the development of affordable housing in urban areas of Kenya. This is because housing is one of the big five agenda items for the government of Kenya, where there is a target to construct 200,000 housing units per year up to the year 2030.

This can only be done through the enhanced application of PPPs and other initiatives involving collaboration between public and private players in the economy. This is because PPPs introduce efficiency, innovation, adequate risk transfer mechanisms, additional finance, technology, and a sustainable return on investment for investors, which attracts more players to housing development (Bayliss and Waeyenberge, 2017).

Theory

Affordable housing development options

Countries have not been able to develop affordable housing because of many reasons, key among them being inadequate financing, technologies, the high cost of building materials, and the limited application of innovation in the sector. In the case of Kenya, the government has made diverse efforts aimed at addressing the situation, which have had mixed success.

Some of the strategies employed include the use of appropriate tax incentives and guarantees to stimulate housing development, as well as the provision of housing infrastructure (Urban Institute, 1995; US State Department of Housing and Urban Development, 1995; Keating et al., 1996; Stoutland, 1999; Katherine and Quigley, 2000). Some countries utilized capital fund funds programs (CFFP), to maintain and rehabilitate public housing stocks.

This is because substantial housing units can be obtained by maintaining the existing stock. Delivery of affordable housing has also been attempted through a sustained review of unresponsive housing laws and policies. Such reviews lead to the operationalization of diverse ways of housing delivery through leveraging on housing subsidies (Stoutland, 1999; Katherine and Quigley, 2000).

Over time, three main approaches have been used to accelerate the provision of housing, including affordable housing. Firstly, it is through banking and commercial institutions, which are mostly owned privately. The challenge with this approach has been the fact that many households are locked out of this method because of the loan access and servicing conditions, including the need for collateral.

Second, the approach has been through the operationalization of rental housing options for low-income urban households with limited purchasing power. Many challenges have been encountered, including government controls and ceilings on the number of units available for such households and the prices applicable to them [(3); Adenji, 2004; Agbola et al., 2007; Ira and Claude, n.d.].

The development of rental housing development options has also been derailed because of the tendency to apply limited innovations, inadequate technology, and mismanagement of public funds, such as subsidies (Omuojine, 1993; Ezimuo et al., 2014).

In addition to the two methods espoused for housing development, countries can also develop housing through public housing schemes, which have had mixed results in addition to disenfranchising urban poor households, which are the main targets for such schemes. Some countries like the United States have operationalized public housing schemes through the administration of low-income credits, the utilization of strategies where certain locations earmarked for housing development are adequately furnished with housing infrastructure to increase housing development, the promotion of new housing construction, and microcredits with the intention of stimulating housing development to address demand issues (Centre for Urban Development Studies, 2001; PM Global Infrastructure Inc., 2003; Stein and Castillo, 2005).

The main challenge is that development and supply of public housing schemes have been declining since the 1960s, underlined by shifting theoretical and economic thinking, in addition to the poor operation and maintenance of existing housing stock [(3); Adenji, 2004; Agbola et al., 2007]. Households have attempted to address their housing needs through informal housing development financing approaches.

These approaches utilize what households have saved, loans that are not formal, diaspora transfers, and the selling of assets that such households own. This method is attractive to

low-income urban households due to its flexibility. The main challenge of the informal housing development method is the limited regulation and controls to ascertain adherence to acceptable standards (Wapwera et al., 2001; Mukhija, 2004).

Advantages and disadvantages presented by the various methods through which accommodation for an urban population can be obtained have been highlighted in the foregoing sections. The main consensus that is evident is that these methods are deficient in one way or another. Going forward, it has been suggested by practitioners of housing development that urban housing growth can be realized through the implementation of appropriate and enabling policies, laws, and regulations that will make it possible to integrate and enhance the participation of multiple actors in the process.

Simultaneously, stakeholders must leverage effective application of incentives, support, housing revolving funds, and housing development funds, as well as develop mechanisms for utilizing public funds to develop mass urban housing. These efforts should be supported by the development of housing infrastructure to reduce the cost of affordable housing development.

These activities, if well implemented, provide an effective way through which application of PPP models for housing development can be achieved (Centre for Urban Development Studies, 2001; PM Global Infrastructure Inc., 2003; Stein and Castillo, 2005; Lawson et al., 2010).

PPPs definition and meaning

The PPP model provides one of the best available alternatives to stakeholders in the quest to provide affordable urban housing. When a decision is made as to the need to apply PPPs, stakeholders are bound to select the definition of the concept they are comfortable with since there are diverse definitions embraced by different stakeholders.

These definitions are key in designing, financing, and implementing projects and also in developing ways through which the private players will recoup their investments (4–6). The Canadian Council for PPPs, for example, describes the PPP concept as a cooperative undertaking that is carried out amongst government and private entities that possess diverse capabilities in addition to knowledge, which is key to successful project execution.

The arrangement should be undertaken to meet public needs that are agreed upon by the PPP partners, like affordable housing development. This can be achieved through the operationalization of suitable systems through which risks, finances, and incentives or reward are properly allocated to the parties [(4, 5, 7); Spiering and Dewulf, 2006].

The major attraction of using PPP models for the construction of affordable built-up area housing is based on the fact that the model is a legally binding contractual agreement intended to achieve specific goals and objectives in the realization of the affordable housing agenda. Through well designed and planned PPP models, housing projects are delivered on time, within budget, and within more affordable cost parameters than would be possible under traditional procurements [(4–6, 8); Edwards and Shaoul, 2003].

The associated changes and benefits realized through PPPs make the model comparable to an organizational shift through which projects of a public nature are implemented, including affordable housing development. This is achieved through an adequate allocation of responsibilities amongst public and private entities, where the latter is mostly assigned project financing, investment, and the actual construction of affordable housing projects, within well-defined timelines.

It has been noted that the development of affordable urban housing projects requires that there is comprehensive risk identification, costing, allocation, and reward mechanisms throughout the project cycle [(7, 9); Yescombe, 2007].

The success of PPP projects is based on the understanding that the private players receive their payment after satisfactory performance of the contracted services. This means that there is a detailed project specification and standards that must be met to enable the private sector to receive payments by charging for use of the facilities or by receiving payments made by the public sector, and sometimes these two can complement each other [(7, 9); Roger, 2002].

Public-private partnership (PPP) models may also imply documented partnerships between the public and private players, including non-governmental and community-based organizations that are not profit-based for service delivery. The PPP contracts provide that parties to such agreements should jointly participate in the development of specific project deliverables and services, and the parties have to agree through special collaboration arrangements on the modalities and approaches for achieving the agreed deliverables (10).

A distinction is drawn between privatization and PPPs. Under privatization, goods and services previously provided through public-sector financing are transferred to private entities with little government involvement. PPPs, however, involve the public sector in setting standards and specifications as well as monitoring and evaluating goods and services provided by the private sector through business and commercial strategies.

These aspects are captured in the World Bank's definition of PPPs, which sees the concept as those long-standing contractual obligations and arrangements that bind the public and private entities in order to achieve agreed-upon tasks like enhanced provision of goods and services.

Under such an arrangement, the private entity is usually assigned substantial quantities of risks and other management aspects of the project, and on the other hand, the government is assigned the task of creating a facilitative environment so that the former can effectively undertake its assigned functions (11).

Public-private partnerships (PPPs), according to the Organization for Economic Cooperation and Development (OECD), are agreements entered into between government entities or agencies and those from the private sector. The aim of such an agreement is to facilitate the provision of goods and services, including the development of affordable urban housing.

The contractual agreement is structured such that the project delivery as per the specifications is assigned to the private players, who should be compensated through the payment of charges for using the developed facilities. In some cases, the public sector can pay the developer for the services and goods provided, or in some cases, the developer can benefit from both sides.

The private players should have the capacity to absorb the inherent risks, and since the public sector is assigned to undertake monitoring and evaluation, it can also set the applicable standards and create an environment for the private players to effectively deliver their assigned activities and tasks (7, 12).

The Public Private Partnerships Act, 2021, of Kenya's definition of PPPs implies that it is a contractual arrangement entered into by contracting authorities on the one hand and private entities on the other. Contractually, the private player is assigned functions traditionally carried out by the public sector, under the principal-agency relationship. In performing such functions, the private entity is authorized to receive payments for performing a public function through compensation, user charges, fees, or a combination of both.

The private sector is further assigned various project-inherent risks, and the assets developed revert to the government at the end of the process (PPP Act, 2021).

Applicability of PPPs in affordable urban housing financing

Public-private partnership (PPP) models have been suggested as the best available alternative for addressing the urban housing challenge because of many factors. These include global shifts in the delivery of public goods and services. The shifts have shown that there is no clear distinction between the roles of the public and private players; hence, they have highlighted the need for cooperation between these players.

These shifts have highlighted the critical issue that the provision of goods and services is not solely the responsibility of the government because such services are contracted to private players, and as such, private entities can supplement government efforts to achieve greater project delivery (4, 7). These shifts have been reinforced by the emerging waves of technology, innovation, and capital mobilization strategies.

The shifts have also been aided by a greater acceptance of user pays principles and the implementation of a variety of private-sector incentives for increased project financing and development [(4, 13); Giti et al., 2018].

These policy reforms and shifts led to the acceptance of privatization as a means of delivering goods and services. The privatization of key goods and services was met with resistance from communities and political classes because such ventures excluded the involvement of government and, hence, the interests of the citizenry were not fully addressed.

Nationalization, which excluded the private sector in the provision of key goods and services, faced resistance too, and hence PPPs were found to be acceptable because they operationalized relationships where the public and private players work together to deliver goods and services. Such relationships led to the introduction of competition, innovation, technology, and efficiency in service provision through liberalization ideologies [(4, 14); World Bank, 2011].

Application of PPPs was also supported by the debt crises of the 1980s, which affected infrastructural and housing development financing by governments, which resorted to greater use of PPPs (2, 4).

The above scenarios led to an increased rate of PPP application in the 1990s globally because the concept was embraced as an innovative procurement method where tasks and activities were bundled together and assigned to a contractor. This encourages private players to be creative and innovative, resulting in high-quality goods and services [(7, 15); Osborne, 2000; Grimsey, 2002].

Public-private partnerships (PPPs) are the opposite of traditional procurement methods, whose challenges include inefficiencies, poor product pricing, corruption, poor service delivery despite overstaffing, poor project management skills, and slow project implementation. These challenges make the traditional procurement methods unfit for the provision of goods and services in modern times due to their complexity and technology demand [(4, 15); Mustafa, 1999; Grimsey, 2002; Harris, 2003].

The scale with which PPP models have been embraced as an alternative to development financing has created a necessity for countries to adopt them based on varying purposes. The common benefits of the application of the PPP model are the efficiency considerations, the integration of all the project's components through bundling, and the whole project life cycle concepts.

This results in more efficient and cost-effective project completion [(7); World Bank, 2011]. Utilization of PPPs leads to greater accountability in the project cycle. This is achieved through the allocation of clear project responsibilities, adherence to the laws, and socio-economic guiding principles between the contracting parties. The public sector has to undertake regulatory supervision, monitoring, evaluation, and greater application of incentives and disincentives to ensure performance and delivery of agreed activities [(4, 15); Browne et al., 2003].

Utilization of PPP models to increase the supply of urban affordable housing has been embraced because it creates room for governments to tap into the expertise, capital,

technology, and innovation of private entities to address housing inadequacy [(7, 15); Farlam, 2005].

Legal and institutional framework for PPPs in Kenya

The government of Kenya created an enabling environment for the utilization of PPPs in the country by first enacting the Public Private Partnerships Regulations 2009, the only PPP laws in the country at the time, which fast-tracked and highlighted the need for the country to tap into PPPs to address its development needs. It was through the PPP regulations of 2009 that many projects were started under the PPP regime, though the lack of a substantive law on PPPs limited the number of PPP projects that could be fully developed (Republic of Kenya, 2009).

To deepen further the utilization of PPP models in the country, the Public Private Partnerships Policy 2011 provided the foundations and justifications for the extensive use of PPP models to supplement efforts by the public sector in the provision of goods and services, including financing the Kenya Vision 2030 development blueprint. This policy was embraced by the private sector since it signaled the Kenyan government's commitment to leverage the advantages provided by the PPP models to finance development projects.

The implementation of the policy necessitated greater legislation on the use of PPPs in order to increase the uptake of the model in the various sectors of the economy (Republic of Kenya, 2011).

The PPP policy of 2011 was followed by the enactment of the Public Private Partnerships Act of 2013 to create an adequate operating environment for greater private sector involvement in infrastructure financing, development, construction, operation, and maintenance. Some of the institutions created were the PPP Unit, PPP Committee, and nodes in the contracting government agencies.

It also led to the creation of the PPP project facilitation fund under Section 68(4) to make projects like affordable urban housing projects viable, bankable, and attractive to private investors. In 2021, the PPP Act 2013 was reviewed and strengthened to deepen the involvement of private entities in financing traditionally public functions (Republic of Kenya, 2013, 2021).

The Public Private Partnerships Regulations, 2014, developed after the PPP Act 2013, were enacted to provide for vibrant processes for PPP applications, including making it possible to tap into the project facilitation fund intended for under Section 68 of the PPP Act 2013 (Republic of Kenya, 2014). The public-private partnerships (Project Facilitation Fund) Regulations, 2017, were further enacted to increase utilization of PPP models in the development process through the provision of financial support to contracting entities.

This is critical in sectors that are not wholly bankable or where private entities would require many years to recoup their investment. The project facilitation funds can be used to finance feasibility studies, consultancies and advisory services, project viability gap funding, and the provision of contingent liabilities, among other things (Republic of Kenya, 2017).

Urban housing development occurs within urban areas in Kenya, hence the Urban Areas and Cities Act (2011) under Section 33 provides that counties, through their corporations or on their own volition, can enter into partnerships for the effective provision of goods and services, including the development of urban housing and related infrastructure (Republic of Kenya, 2011).

However, the County Government Act (2012), the anchor law for counties, provides in Section 6(3) that subnational entities in Kenya can enter into strategic partnerships, or PPPs, with the public or private sectors to deliver goods and services within their jurisdictions. Major urban needs in Kenyan counties include affordable urban housing, which can be provided through PPPs (RoK, 2012).

Theoretical framework

The principal agency theory (PAT), which explains the relationship between public entities (the principal) and private players (agents) in the provision of public functions, under the PAT arrangements, the principal (public sector) or government contracts the agent (private sector) to perform its traditional functions on its behalf. To operationalize the arrangement, the agent takes on more responsibilities and risks and makes decisions to finance, construct, operate, maintain, and later hand over the affordable urban housing program.

However, the principal is obligated to incentivize the agent to undertake such functions. Such arrangements are best illustrated through the PAT, which was developed by Laffont and Tirole in 1993 [(4, 7); Meckling et al., 1976; IMF, 2009; Delves and Patrick, n.d.]. PAT creates an operational collaboration that binds the government and the private players in the specific PPP deal.

This is in order to deliver affordable urban housing and thereby address the needs of urban dwellers. PAT focuses on methods and systems through which stakeholder interests are aligned, making it possible to deliver goods and services as per project specifications [(4, 7, 10, 16); The Wealth of Nations, 1776; Smith, 1999; Otten, 2005; Delves and Patrick, n.d.].

Principal agency theory (PAT) supports the development of necessary compromises between the principal and the agent in order to achieve greater delivery of commonly agreed goods and services, like the development of affordable urban housing. PPP experts have opined that such alignments and interests can best be handled through the

establishment of a special purpose vehicle (SPV) or company, which manages the interests of financiers, developers, and contractors [(4, 7, 16); Mitnick and Barry, 1973; Epstein, 2013; Delve and Patrick, n.d.].

Research methods

In order to collect the necessary data to answer the emerging questions on the likely utilization of PPP to construct and develop affordable urban housing, and given the fact that the PPP models have not been fully used at such levels of housing before, it was necessary to use the Delphi methodology. The researcher utilized experts who had knowledge on the application of PPP models in other sectors of the economy to predict, forecast, and make informed judgments through the consensus that would be generated through such experts [(17); Ritchie and Goeldner, 1994; Donohoe and Needham, 2009].

The most noticeable feature of Delphi studies is the organization of communication and engagement of selected experts through groups or panels. This communication and interaction between the experts and the researcher is undertaken anonymously [(18); Linstine and Turoff, 1975; Paliwoda, 1983; Erdener, 1994].

The sampling frame of a Delphi study was demarcated by Erdener (1994) and Clayton (1997), who observed that a typical Delphi panel of 15–30 persons could be ideal for data collection in a homogenous group of experts. The study utilized three panels of 25–30 persons each, as proposed by Murray (19) and Gordon (1994), because many studies concluded that there is no relationship between panel size and the effectiveness and efficiency of the data collected (18).

On the distribution and attributes of the panels, the first panel comprised 30 housing financiers (employees of banks and financing institutions that provide loans and mortgages for housing development within Nairobi city county). The second panel consisted of 28 housing developers (drawn from employees of leading housing construction and development companies within Nairobi city) who are members of the Kenya Property Developers Association (KPDA).

The third panel included 30 housing officers from Nairobi city, county, and the state Housing and Urban Development Department.

On Delphi data collection procedures, it was guided by Linstone and Turoff (2002), Okoli and Pawlowski (2004), and Seuring and Muller (2008), all of whom have pointed out that, preferably, Delphi studies should be carried out till a point where no new and further perceptions or discoveries emerge. Though the Delphi rounds can be as many as possible, three rounds are considered adequate, and hence this study relied on three rounds of the Delphi process, which were considered adequate to answer the questions on the likely success arising from the utilization of PPP models to address the supply of affordable urban housing projects.

The researcher used questionnaires to seek answers from the panelists from rounds one through three. Round one Delphi questions were exploratory and were examined and classified using content analysis techniques. The answers from round one Delphi were used to develop questions for round two Delphi, after which the answers were used to formulate third round Delphi questions, after which detailed analysis was undertaken (Mitchel, 1991; Pateman, 1998; Hasson et al., 2000; Somerville, 2008).

Summary of research methods

The study utilized Delphi methodology to measure the likely extent to which PPP models can be applied to develop affordable urban housing in Kenya. The methodology involved the utilization of Delphi rounds of questions that were carried out three times. The rounds involved the administration of questionnaires to 88 panelists.

Round one was exploratory, round two was based on the findings for round two, while round three questionnaire was based on the findings from the first and second round answers. Content analysis was used for analysis of round one and two Delphi iterations and final analysis done at the third round.

Results and discussions

In round one of Delphi, the researcher found out that 95.5% of the respondents agreed with the declaration that PPP models are appropriate to develop affordable urban housing. However, while 4.5% observed that PPPs are not applicable in the development of affordable urban housing in Kenya.

Further interrogation of the respondents found that of the 95.5% who held the view that PPPs are applicable, four ways were highlighted through which the applicability of PPP models to develop affordable urban housing would be made possible. The first one is through the provision of land by the public sector (recording a frequency of 57 or 64.8%). Such land owned by the public sector would be treated as an equity contribution by the government.

The provision of land by the public sector should be followed by the development of housing infrastructure on it in order for the private sector to undertake affordable urban housing investments. Secondly, the government can provide assurances or guarantee the process by creating specific incentives and creating a favorable environment for investments and the use of long-term savings like the National Social Security Fund (NSSF), pension funds, unclaimed financial assets, and other funds for retirement available in the country.

This had a frequency of 17 or 19.3%. Thirdly, is through the utilization of various PPP models (with a frequency

of 8 or 9.1%), like build-own-operate (BOO), build-own-transfer (BOT), design-build-maintain (DBM), land swaps, joint ventures, and turnkey models. Fourthly, it was through the incorporation of mixed project delivery methods for housing development (with a frequency of 6 or 6.8%); for example, it can be done through outright sales, community housing, rental housing, occupant purchase schemes, and incremental and cooperative housing schemes, as highlighted in **Table 1**.

The utilization of PPP models to develop affordable urban housing was likely to face five major obstacles, as highlighted by the respondents. The first is that PPP models require long-term transactions and preparations before the project can be implemented. The long-term nature of PPP models implies higher costs of transactions, for example, high expenditure on transaction advisors, which, when juxtaposed with the high profit motivations and demands from the private sector in a faster and quicker manner, makes the process complicated and unattractive to such proposed developers.

This means there is likely to be low resource mobilization for the project and hence slow uptake because such projects may require high levels of incentives to overcome the difficulties that lie in the process. This challenge recorded a frequency of 33 or 37.5%. The second obstacle is the prospect of limited access to serviced land that is also equipped with adequate housing infrastructure, which recorded a frequency of 23 or 26.1%.

The third hurdle was provided by the limiting nature of some of the laws that are necessary to operationalize PPP model application in the country. The existing laws, for example, on urban affordable housing may make it impossible to quickly structure an effective PPP deal with a frequency of 15 or 17.1%. The fourth hurdle was cited as the fact that there is limited collective and common vision, objectives, and motivations for housing the urban poor. Such limited visions for housing the urban poor are also complicated by incidences of corruption or, in some cases, political interference, with a frequency of 10 or 11.4%.

The fifth hurdle was cited as the existence of insufficient know-how about the operations, structuring, and utilization of PPP models in the development of affordable urban housing, with a frequency of 7 or 7.9% as presented in **Table 2**.

In addition, the respondents highlighted six major challenges that may limit the appropriate application of PPP models to construct affordable urban housing. The first one stems from the fact that in the process of structuring and implementing PPP projects, there is likely to be incompatibility between the project goals, objectives, and key drivers for such collaboration between the government and private entities with a frequency of 35 or 39.8%.

Secondly, there is the likelihood of bureaucratic challenges coupled with under-investments in urban affordable housing red tape, with a frequency of 23 or 26.1%. The third challenge was cited as a low understanding of the utilization of PPPs in the construction of affordable urban housing, with a frequency of 12 or 13.6%.

The fourth challenge was cited as the presence of laws and policies that were not clearly spelled out or enacted and that have created bottlenecks and hindrances to the effective participation of the private players in the development of affordable urban housing, with a frequency of 10 or 11.41%. The fifth challenge was cited as limited financing arrangements for the anticipated long-term affordable urban housing financing model, as is common with most PPP projects, with a frequency of 8 or 9.09% as shown in **Figure 1**.

During round two of the Delphi analysis, it was found that there are seven probable approaches that would be structured to make PPP models utilizable in the development of affordable urban housing in Kenya. The first approach could be reliance on and learning from national and international PPP projects that have succeeded within the agreed parameters, with a frequency of 192.

The second approach was cited as the need to tweak the operating legislation framework toward favorable treatment of the utilization of PPP models in the development of affordable urban housing, with a frequency of 144. The third approach was cited as structuring the PPP models and projects such that they can utilize different and various financing sources, including use of pension funds, insurance funds, and unclaimed financial resources, with a frequency of 128.

The fourth approach was cited as the necessity to make housing and housing-related processes and products tradable through, for example, the stock or securities market so that more investments can be derived from the process, with a frequency of 125.

The fifth approach noted that in order to deliver affordable urban housing, the government must be able to provide housing infrastructure so that housing developers provide

TABLE 1 | Possible ways through which PPPs could be applicable in affordable urban housing.

S/Nos.	Items	Frequencies	%	Ranks
1	Provision of land and housing infrastructure by public sector	57	64.8	1
2	Provision of agreements, enticements, enabling environment and diverse financing and uptake models	17	19.3	2
3	Application of various PPP models	8	9.1	3
4	Integrate mixed delivery methods for housing	6	6.8	4
Total		88	100	

TABLE 2 | Challenges and solutions to the applicability of PPPs in affordable urban housing.

S/Nos.	Challenges	Frequencies	%	Ranks
1	Longer PPP transactions time	33	37.5	1
2	Inadequate access to serviced land	23	26.1	2
3	Inadequate PPP operationalization laws and regulations	15	17.1	3
4	Lack of common vision, goals, and values	10	11.4	4
5	Inadequate knowledge on PPPs, structuring, implementation	7	7.9	5
Totals		88	100	

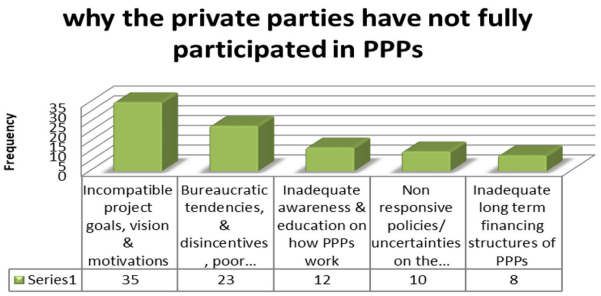

FIGURE 1 | Why private parties have not fully participated in PPPs in affordable urban housing PPPs.

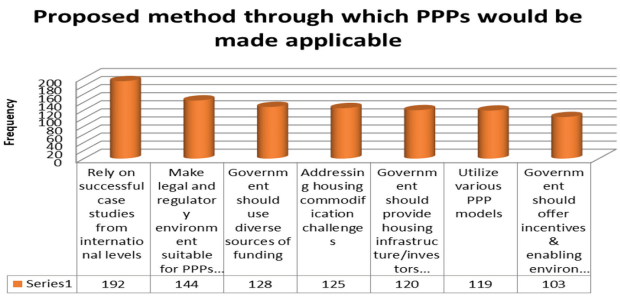

FIGURE 2 | Proposed methods through which PPPs can be made applicable in affordable urban housing.

the much-needed technology, finances, innovation, and managerial expertise on the other hand, with a frequency of 120. The sixth approach noted that for successful PPP projects, stakeholders may need to use diverse PPP models and a mixture of them to make sure that all aspects, challenges, and interests of stakeholders are addressed.

With a frequency of 119, there is a need to leverage joint ventures, turnkey transactions, and land swaps, among other things. The seventh approach was cited as the necessity for the public sector to provide adequate guarantee mechanisms, creating an enabling background, which recorded a frequency of 103, as illustrated in **Figure 2**.

In order to ensure PPP models are applicable in the development of affordable urban housing, the panelists provided six learning points that, if utilized, would make PPP projects succeed. The first learning point noted that countries that are desirous of using PPP models should first build local capacities and strategies in PPPs; this reduces the high costs of hiring transaction advisers and other charges, with a standard deviation of 0.30%.

The second learning point is the necessity to structure projects that are attractive to private developers by making them bankable and implementable in the construction of urban affordable housing with a standard deviation of 0.32 or 13%.

The second learning point was the necessity to develop standardized ways of dealing with PPP project procurements, structures, manuals, processes, and steps that should be followed so that all stakeholders do not spend too much time, money, or resources on the same, with a standard deviation of 0.36%.

The fourth learning point was on the need for stakeholders to carefully arrange, proceed with negotiations, and operationalize PPP models and structures that can suitably work in the development of affordable urban housing. This should be done in such a way that the concerns and key aspects of all stakeholders are addressed, so that all of them can jointly implement the project to success, and such a lesson had a standard deviation of 0.37 or 15%.

The fifth lesson was that stakeholders should identify and use PPP champions, stakeholders that can set the pace, and also mix that with the utilization of success areas under PPPs to develop urban housing. The champions will act as goodwill ambassadors to encourage many sectors to use and adopt PPPs, with a standard deviation of 0.41%.

The sixth lesson was that to guarantee the success of PPP models in the development process, stakeholders should use diverse models and methods like joint ventures, turnkey projects, land swaps, or a mixed method approach. This lesson recorded a standard deviation of 0.65, or 27%, as shown in **Figure 3**.

In round three of Delphi, the panelists recognized six major hurdles that, if not addressed, can slow down the applicability of PPPs in the construction of urban affordable housing. The first issue was the fact that PPP projects are long-term in nature, and this impacts the rate at which investors can recoup their investments, with a standard deviation of 0.25.

This compares with findings in round one of Delphi, which means that investors are likely to consider the time that it takes to get back the investments that are made in urban housing projects under PPP models. The second

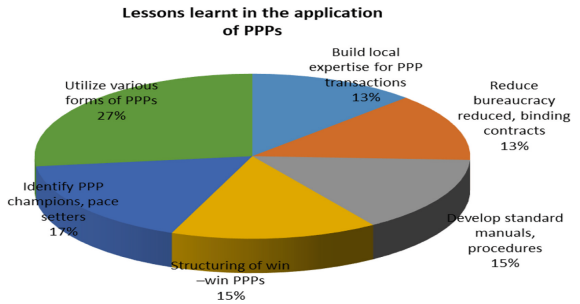

FIGURE 3 | Combined lessons learnt in the application of PPPs by the panels.

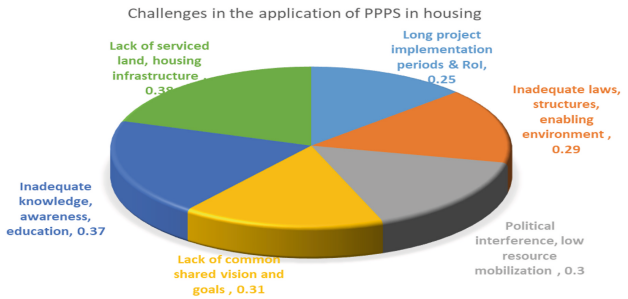

FIGURE 4 | Challenges likely to face the application of PPPs in housing development.

hurdle was cited as the existence of limiting legislation in the applicability of PPP models, especially in social aspects like urban affordable housing, where returns are slower and smaller as compared to physical infrastructure, with a standard deviation of 0.29.

The third hurdle was cited as the probability of urban housing projects under PPPs facing political interference or cases of corruption, which has the effect of increasing the overall production cost, which increases the final cost that the targeted households will pay to access the housing units, with a standard deviation of 0.30.

The fourth hurdle was cited as the limited existence of a national vision and consensus for housing the urban poor, which would push stakeholders to adopt a variety of methods, including PPPs, to address the issue, with a standard deviation of 0.31.

The fifth hurdle was cited as the lack of knowledge on how PPP models can be structured, operationalized, and effected for the construction of urban affordable housing; this would make it easier to apply the models and also ensure neither side is short-changed by the other, with a standard deviation of 0.37.

The sixth hurdle that should be addressed is the existence of inadequately serviced land with housing infrastructure, which would reduce the final housing construction costs and finally ensure that the housing units can be affordable for the target group. This recorded a standard deviation of 0.38, and these challenges are presented in **Figure 4**.

Conclusion and recommendations

The six major challenges that have been highlighted in the study are some of the hindrances to the effective application of PPPs in the development of urban affordable housing. These challenges include the long periods taken to implement PPP projects before the investors can recoup their investments, hence the need to address timelines under PPP programs.

Secondly, there are inadequate laws, regulations, institutional frameworks, and enabling environments for the application of PPPs in the development of affordable urban housing, and to address such issues, the law must always be updated and reviewed to reflect the existing realities.

Thirdly, there is the issue of political interference in implementing PPPs for affordable urban housing and attendant corruption. Stakeholders have to address corruption and other issues of interference and, hence, be guided by the long-term commitments for national development.

Fourthly, there is a lack of a common and shared vision and goals for housing the urban poor, despite the fact that these are people who affect the nation's competitiveness. The solution is to build consensus in a country on the need to house the urban poor and, hence, make urban areas competitive and engines of growth as they should be.

The fifth challenge was cited as the lack of knowledge on how PPPs operate and work; hence, stakeholders are prone to making mistakes that may be costly to the actual project implementation. The solution lies in ongoing capacity building and sensitization about the use of PPPs in various sectors of the economy. The sixth challenge was cited as the lack of adequately serviced land with social and physical infrastructure, which makes the final housing units expensive and out of reach of the urban poor. There is a need for the public sector to invest in housing infrastructure to spur housing development.

The conclusion made from the study is that PPPs are applicable in the development of affordable urban housing after addressing the challenges as per the solutions that are appropriate. The main recommendation is for the public entities and government in Kenya to apply PPPs to develop affordable urban housing to address the housing shortages that are highest in urban areas in Kenya.

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