



THE NATIONAL
RESEARCH INSTITUTE
PAPUA NEW GUINEA

DISCUSSION PAPER

POTENTIAL PUBLIC PRIVATE
PARTNERSHIP STRATEGY
FOR PROMOTING EFFECTIVE
HOUSING DELIVERY IN PAPUA
NEW GUINEA

Patrice Savadogo
Eugene E. Ezebilo

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Abbreviations & Acronyms

| | |
|---------|--|
| ABH | Annuity-based subsidised housing |
| AGH | Annuity-cum-capital grant-based subsidised housing |
| BSP | Bank of South Pacific |
| BSS | Build-Sell-Share |
| DFHP | Duran Farm Housing Project |
| DLPP | Department of Lands and Physical Planning |
| DRH | direct relationship rental housing |
| DROH | direct relationship ownership housing |
| GGC | Glory Group of Companies |
| GLH | Government land-based subsidised housing |
| ICCC | Independent Consumer and Competition Commission |
| MDH | Mixed development cross-subsidised housing |
| NHT | National Housing Task force |
| PNG | Papua New Guinea |
| PNG LNG | PNG Liquefied Natural Gas |
| PNG NHC | PNG National Housing Corporation |
| PNG NRI | PNG National Research Institute |
| PPP | Public private partnership |

Abstract

Public private partnership (PPP), which promotes effectiveness and efficiency in housing delivery, is the paradigm that most countries have adopted. However, identifying the most suitable PPP strategy for a country is often problematic. This paper reports on a study of PPP strategies that could potentially be used for housing delivery in Papua New Guinea (PNG), challenges associated with implementing a PPP project, and factors that should be considered for a PPP project to succeed. The data were obtained from a review of policy documents and unpublished (grey) and published papers, as well as face-to-face interviews with private developers and an official of the PNG National Housing Corporation (PNG NHC). The findings show the direct relationship ownership housing (DROH) PPP and the direct relationship rental (DRH) housing PPP might best fit the conditions in PNG. PPP projects in PNG are constrained by bureaucratic problems associated with the public sector, unclear delineation of roles of the public and private sectors in housing delivery, shortages of land with proper title, financial problems, and inadequate trunk infrastructure. For a PPP project to succeed in PNG, it is necessary to consider factors such as transparency in the PPP process, strategies to allocate risks between the public and private sectors, the need for political and public support, and the need for a strong private consortium. The findings of this study could contribute to review of the PNG National Housing Policy 1994 by considering PPP strategies in housing delivery. This could assist policy-makers, urban development managers, and planners to make informed decisions about resource allocation in the housing sector.

Introduction

Housing is a basic necessity for humans. However, providing adequate, quality, and affordable housing for all income groups has been a long-standing issue for governments of most countries (Yuan et al., 2017; Özdemir, 2011; Miao, 2016). This is because the supply of houses has not been able to match demand for housing, which pushes up house sale prices and rent prices (Ibem, 2011). To address the problems associated with the shortage of houses, governments of most developing countries have attempted, using several programs, to provide housing through their agencies. However, they have not been successful in providing adequate, quality, and affordable houses for households from all income groups (Hassan, 2011; Ezebilo, 2017; Yuan et al., 2017). Potential strategies for attracting private investment in housing, aimed at boosting supply of houses, has also been explored by these governments (Ibem & Aduwo, 2012). To this end, several authors have found the private sector is more effective and efficient in providing houses than the public sector. For example, in their study of housing delivery in Nigeria, Adegun and Taiwo (2011) found involvement of the private sector is required for housing delivery to succeed. After reviewing studies of public private partnership (PPP) projects in the construction industry, Tang et al. (2010) concluded the private sector is more efficient and effective than the public sector in delivering housing. Cartledge (2006) also found the private sector is more efficient than the public sector. This could be because the private sector is more influenced by market forces and competition than the public sector.

However, the goal of the private sector in housing delivery is to maximise profit (Gravelle & Rees, 2004). This implies the private sector might find it difficult to provide houses that are affordable for low-income groups. For this reason, a paradigm for providing housing that involves collaboration between the public and private sectors emerged (Osei-Kyei & Chan, 2015). This arrangement is known as PPP, and has the potential to improve productivity in the public sector and resolve problems associated with resource use in housing delivery (Tang et al., 2010). For these reasons, governments of most countries — such as Australia, Brazil, China, Malaysia, and Nigeria, — have adopted the PPP to provide houses for their citizens (Abdul-Aziz & Kassim, 2011; Ibem, 2010; Yuan et al., 2017; Cheung et al., 2012). The PPP is a range of institutional arrangements between the public and private sectors to share responsibilities associated with providing housing (Ibem, 2011).

In Papua New Guinea (PNG), providing quality and affordable housing for low-income and middle-income households is becoming a challenge for the government (Webster et al., 2016). This is primarily because the rate at which houses are constructed can not match demand, as well as the high sale prices and rent prices for houses (Ezebilo et al., 2016). Major cities of PNG are hit hardest by the high house sale prices and rent prices. The migration of rural dwellers to the cities in search of jobs to better their lives contributes to an increase in demand for housing. For this reason, most people who live in cities such as Port Moresby have housing affordability problems because they find it difficult to pay rent and at the same time pay for other necessities (Ezebilo, 2016). To mitigate the housing affordability problem, the current and past PNG governments have used initiatives such as providing houses for public service workers. However, these initiatives have not resolved the problems, primarily because of poor implementation and monitoring.

To boost the supply of houses, especially in major cities of PNG, several large-scale private developers — such as EDAI Town Housing Development Limited, Glory Group of Companies and Curtain Brothers — have emerged. However, these companies are often constrained by challenges that restrict their investment in the housing sector. For example, in their study of prospects and challenges of private sector provision of housing in PNG, Ezebilo and Hamago (2017) found that private property developers have the potential to provide quality housing. However, these developers are often constrained by shortage of land for development, and lack of trunk infrastructure such as, sewerage facilities, and electric power.

Currently, the escalating shortage of houses and the inability of most households to afford house sale prices and rent prices have led the PNG Government to increase its interest in PPP in provision of housing. This is reflected by the National Public Private Partnership Policy 2014, and Public Private Partnership Act 2014. However, there are several PPP strategies. This implies that each country must adopt strategies suitable to their socio-economic conditions and traditions. For this reason, the overarching question for PNG is: what PPP strategies should we adopt? The findings from this paper will provide an answer to this question.

The aims of this study are:

1. to examine PNG housing sector, different approaches to providing housing, and different PPP strategies.
2. to examine factors that contribute to the success of PPP projects, identify challenges associated with the projects, and explore potential strategies for mitigating the challenges.
3. to develop potential PPPs for providing housing in PNG.

It is hoped that findings from this research will provide useful information that can be used in the review of the PNG National Housing Policy 1994 (Government of Papua New Guinea, 1994). The findings could also provide policy-makers and housing development planners in PNG greater understanding of potential PPP strategies for providing quality and affordable housing.

Conceptual framework

The financial leverage hypothesis stipulates that PPP provides the public sector (government) with the opportunity to leverage greater financial resources (Kopp, 1997). For this reason, the propensity of a government to adopt PPP for providing housing is strongly linked to the budget constraints it faces. Governments that adopt PPP have the potential to implement many projects using limited financial resources. This indicates that countries facing fiscal problems are more likely to adopt PPPs (Kopp, 1997). It is important to note that financial aspects of a project are one of the main components considered when deciding whether to adopt PPP in housing projects.

As there can be many risks associated with housing projects, governments often adopt PPP to share the risk with the private sector. This is because the private sector has greater potential than the public sector to manage risk effectively (Cartlidge, 2006). Although risk might be more evident in the later phases of a housing project, it requires an effective management process throughout the entire life cycle of the project. A risk management system that is applied in PPP projects must reflect the peculiarities of the project. It is also necessary to undertake a forward-looking and life cycle oriented risk assessment. This has the potential to provide insights into remote and proximate causes of identified risks and potential risks at the outset of the project. An understanding of stakeholders' capacity and willingness to manage risks and respective allocation of risks among the stakeholders is necessary in the establishment of PPP. Involving private financing at the outset of a housing project might encourage more effective and efficient management of financial resources, which promotes a disciplined risk management in the PPP.

According to the PPP arrangement, the private sector is often tasked with designing a housing project so that the project could benefit from innovation and efficient use of scarce resources. To minimise the risk of the private sector deviating from the objectives of the project, it is necessary for the public sector to guide the private sector. However, striking a balance that protects the interest of the public sector and the private sector is often problematic when defining the contractual framework of technical requirements (Campos et al., 2008). The PPP often gives rise to technical skills, which have the potential to promote cost-effective quality services and trunk infrastructure. However, if the PPP is not properly organised it might compromise the provision of social goods originally provided by the public sector (Akintoye et al., 2003).

The engagement of the private sector could stimulate the public sector toward considering market forces more when making decisions, which should improve the competitiveness of the private sector. Public agencies are often of the opinion that the State would always support them financially, which often results in moral hazards among these agencies. PPP is often established to avoid this risk and to improve efficiency and effectiveness in the provision of housing and infrastructure. This has the potential to increase value-for-money through reduced construction and operating costs and increased efficiency. The PPP promotes value-for-money because it often improves technical efficiency and allocation efficiency. In addition, PPP might promote value-for-money when it is established in a long-term cooperative relationship between stakeholders, which involves risk sharing, proper delineation of authority, communication, responsibility, and accountability (Reeves, 2004).

Data collection

The data were collected from a review of relevant documents related to PPPs and approaches used for housing delivery. Data were also collected from interviews with private developers and discussions with an official of the PNG National Housing Corporation (PNG NHC).

The document review included published and unpublished (grey) papers, as well as policy documents associated with PNG such as the PNG Public Private Partnership Act 2014, PNG National Public Private Partnership Policy 2014, and PNG National Housing Policy 1994. Other documents include the Independent Consumer and Competition Commission (ICCC) report of 2010. Several papers published on the subject by research institutions in PNG, such as the PNG National Research Institute (PNG NRI), were also reviewed.

For the policy documents, PNG Public Private Partnership Act 2014 was captured from Google search engine by using the keywords “PNG PPP ACT”, whereas the National Housing Policy 1994 document was collected from the PNG NHC office, Port Moresby. The PNG National Public Private Partnership Policy 2014 was captured from Google by using the keywords “PNG PPP Policy”. The ICCC report was collected from Google search engine by using the keywords “PNG housing + real estate + industry + ICCC”. Relevant documents were searched for on the PNG NRI website (www.pngnri.org); several papers, such as Webster et al., (2016), Ezebilo (2016), and Nao and Ezebilo (2017), were captured during this search.

To draw lessons on the subject from other developing countries, a brief review of previously published papers in peer-reviewed international journals was conducted. Google Scholar and Scopus search engines were used to identify papers related to the subject of this study. Several keywords such as “housing provision approaches”, “Public Private Partnership + housing”, “public private partnership + critical success factors” and “public private partnerships + types” were used to identify relevant papers.

The titles of all captured papers were screened for relevance to the subject of the study. Papers that did not have relevant titles were excluded, whereas the abstract of papers whose titles were relevant were read. If an abstract contained content related to the keywords such as housing provision approaches, public private partnerships, critical success factors in PPP, and type/forms of PPP, the full paper was sought for reading. However, in some cases a subscription was required to access the full paper; as such, only full papers that could be accessed without a subscription were read and used in this study. As we are interested in papers that might be most relevant to the conditions in PNG, the majority of papers selected for review were from developing countries that were written in English. A few papers were from developed countries. A total of 20 papers from international journals and one working paper were reviewed. The review was used to generate an overview of the PNG housing sector and PPP policy in PNG, approaches to provision of housing; factors that could promote effective and efficient PPP, and potential strategy for promoting PPPs in the provision of housing in PNG.

The face-to-face interviews were conducted with four private developers and one official of the NHC. The private developers were two directors of EDAI Town Development Limited and two developers of the Duran Farm Housing Project (DFHP). The developers were asked questions about the challenges they face in providing housing in PNG and the contribution of the government towards creating an enabling environment for the construction of houses (see Appendix 1). The NHC official was asked questions about the framework applied in the DFHP. All questions encouraged open-ended responses.

Findings

Overview of the development of housing sector and PPPs in PNG

In the colonial and early post-colonial period, PNG had no comprehensive housing policy. Housing was provided on the basis of ad-hoc decisions (Kaitilla & Sarpong-Oti, 1994). Moreover, government discouraged urban settlement and required employers to return to their villages on completion of work assignments. However, in the mid-1940s, the regulation governing migration to urban areas was relaxed (Kaitilla & Sarpong-Oti, 1994). At that time, emerging towns were experiencing extensive proliferation of squatter settlements and traditional urban villages with little or no basic services at all. In response to the problems associated with the shortage of houses in urban areas, the National Housing Commission was established in 1968 with the mandate of meeting government workers' demand for housing. The Commission developed several housing schemes such as the settlement blocks with self-housing and low-cost houses, which are for low and middle-income workers (Webster et al., 2016). At that time, the private sector did not have incentive to invest in real estate enterprises because there was no strong market demand for it. This is because the government provided housing for its workers. For this reason, the private sector mimicked the public sector by also providing housing for its workers.

The rapid migration of rural dwellers to cities such as Port Moresby and Lae in search of jobs to better their lives resulted in an increase in population in these cities. The demand for houses outstripped the supply of houses, which pushed up house sale prices and rent prices in these cities. To address the problems associated with the shortage of houses, the Morgan Committee was established. The Committee was tasked with exploring potential strategies that could be used to proffer a solution to the housing shortage and affordability problems. The Morgan Committee 1978 made several recommendations, including that the private sector finance should be utilised for housing and that the supply of land for housing and development should be based on equitable arrangements between landowners and developers. However, these recommendations were not implemented and the housing affordability problems persisted as the population of urban areas continued to rise. At that time, there was no housing policy providing guidelines for housing development. For this reason, the National Housing Policy was introduced in 1994 to provide the framework and guidelines for the housing sector. The main goal of the National Housing Policy 1994 was "ensuring that all Papua New Guineans have access to decent housing at affordable cost by the year 2000" (Government of Papua New Guinea, 1994). However, the roles of the public sector and private sector in that policy were not clear, which resulted in a mismatch of roles between these sectors. The public sector continued to dominate the housing sector because the housing policy appears not to have been attractive to the private sector.

The economic development in PNG, such as the PNG Liquefied Natural Gas (PNG LNG) project, resulted in further increases in house sale prices and rent prices beyond the reach of most residents of major cities of PNG, including Port Moresby. In response to the heightened housing affordability problem, the government established the National Housing Task force (NHT) in 2007 to identify constraints to the development of a well-functioning housing market. The NHT recommended private sector involvement in housing projects should be encouraged, and that governmental agencies should play facilitating and regulatory roles. It is necessary to increase the supply of land for housing and improve land administration systems. However, the NHT report not submitted to the National Executive Council for deliberations and its recommendations were not implemented.

Furthermore, the government commissioned the Independent Consumer and Competition Commission (ICCC) to review the activities of housing and real estate industry and to offer possible solutions for the housing affordability problem. The ICCC found that government housing agencies had little success in providing housing and that the high house prices were triggered by inefficient and insufficient supply of land and unclear government policy (ICCC, 2010). To move the housing sector forward, the ICCC recommended that there is a need for the State to put more effort towards increasing the supply of secure land for housing. The State should also introduce a strategy that could eliminate discriminatory policies that the PNG NHC and other government agencies often use to crowd out the private sector. In their review of property and housing policy development

in PNG, Webster et al. (2016) found the supply chain for housing in the country is too long and resource-intensive, and has many bottlenecks. They reported that if the intention is to move the housing sector forward, government agencies must withdraw from the direct provision of housing and focus on facilitatory activities for the private sector in the housing industry.

Of all the reports associated with access to adequate, quality, and affordable housing in PNG, the most common recommendations are: (1) government agencies should play facilitatory and regulatory roles and the private sector should construct houses; and (2) the government should put more effort toward unlocking customary land for housing and development by making customary land administration more efficient.

The most current initiatives taken by the PNG government toward increasing the housing stock in major cities of PNG are outlined in the following paragraphs.

Social Housing Program/Build-Sell-Share

To boost the supply of houses in PNG, the PNG NHC adopted the Build-Sell-Share (BSS) scheme, which aims to profitably develop low-cost houses. Under this scheme, private developers construct houses on NHC's non-registered land, which is sold below market price (Oxford Business Group, 2015). The BSS scheme is used in the social housing program being implemented in the Duran Farm Housing Project (DFHP), which was established in 2014. The project is expected to deliver 2500 houses each year. Amenities such as schools, clinics, hotels, shops, banks and a fire station are included in the DFHP development plan (Hausples, 2017). The houses at Duran Farm will be sold to public servants and the general public at prices below the market price. Several houses have been completed at Duran Farm but have not yet been occupied. This is because trunk infrastructure such as clean piped water, sewerage facilities, electric power, and an access road that government agencies ought to have introduced, is lacking (Nao & Ezebilo, 2017). In addition to the DFHP, an affordable land and housing program was launched at Gerehu Stage 3B, Port Moresby in 2015 by the Office of Urbanisation. However, houses have not been constructed there because trunk infrastructure is still being established.

First Home Ownership Scheme (FHOS)

The First Home Ownership Scheme (FHOS) is a partnership initiative between the PNG Government and the Bank of South Pacific (BSP). The FHOS creates a pathway for Papua New Guineans who are employed — either in the public service or private sector — to have access to loan facility for acquiring houses of their choice (BSP, 2017). To be eligible for the housing loan, the applicant must be a citizen of PNG, employed in the formal sector, and willing to pay 10 percent equity. An individual can get a maximum loan of K400,000 (USD121,212), which attracts an interest rate of three percent per annum and a repayment period of 40 years.

District Housing Program

In addition to the social housing program, the PNG government launched the “Two million District Housing Program” for government workers in 2015. The name derives from the two million Kina given to each district of PNG each year. The State contributes K1 million (USD303,030) while all open members of the parliament and provincial governors contribute K500,000 each, totalling K2 million for building 10 houses in each of the 89 districts of PNG each year (Hausples, 2017). To date, little is known about the progress or implementation of the program (Ezebilo, 2017).

Private sector participation in the housing sector

The economic boom in PNG resulted in the emergence of several large-scale property developers. These property developers include Curtain Brothers PNG Limited, Lamana Development, EDAI Town Development Limited, Glory Group of Companies, and Pacific Palms Property Limited.

Curtain Brothers PNG Limited

Curtain Brothers PNG Limited was founded in 1967 and is based in Port Moresby (Curtain Brothers, 2017). The company provides civil construction services for resource and construction industries, and offers design and construction and civil engineering services, including drilling and tunnelling. In recent years, Curtain Brothers

has re-directed its focus to developing residential properties through its company “South Pacific Homes”, which focuses primarily on developing residential and commercial properties.

Lamana Development

Lamana Development focuses on developing luxury apartment units, commercial office buildings, industrial suites, and high-quality hotels in PNG (Lamana Development, 2018). In addition to managing a chain of premier hotels and executive apartments, Lamana Development also manufactures affordable quality steel-framed housing with international accreditation.

EDAI Town Development Limited

EDAI Town is located along the PNG LNG corridor, in the Central Province, north-west of Port Moresby. It is a joint venture initiative between Boera Holdings Limited (a local landowner company) and JC-KRTA Consulting Group (a Malaysian company). As a result of this partnership, they have incorporated a company called EDAI Town Development Limited, which is the developer for EDAI Town. EDAI Town provides a holistic approach to develop the quantity and quality of housing required in suburban Port Moresby (Aleker, 2016).

Glory Group of Companies

Glory Group of Companies (GGC) was established in 2008 and is based in Port Moresby. It comprises Glory Estate Limited, Glory Holdings Limited, and other subsidiaries (Glory Group, 2017). The company is involved in the construction and property development. Since its inception, GGC provides houses in gated communities.

Pacific Palms Property Limited

Pacific Palms Property Limited provides residential, commercial, retail and industrial property throughout the country. The company oversees building and land assets in Port Moresby, Lae, Madang, Wewak, Goroka, Mt. Hagen, Popondetta, and Rabaul.

PNG’s Public Private Partnership Policy

Public-private cooperation in the provision of infrastructure in PNG began in 2008 when the PNG Government endorsed a national PPP policy to facilitate private investment in the delivery of infrastructure. The policy was developed by the Public Private Partnership Task Force. The objectives of the policy include to: achieve the development plans of the government; improve the efficiency and quality in the delivery of infrastructure and services; mobilise private sector investment in infrastructure projects; and achieve value for-money for the government (Public Private Partnership Task Force, 2014). The policy focuses on three key principles, which include value for money, competition, and transparency. It highlights four stages that PPP projects need to undergo to succeed in PNG: submission of project concept note to the PPP Centre (development stage); advertising for expressions of interest and bidding (procurement stage); construction and operation stage; and contract termination stage.

The Public Private Partnership Act 2014 was passed by the National Executive Council in 2014 (National Executive Council, 2014). The Act established a PPP Centre whose primary task is to assist the government in developing, tendering and implementing PPPs (National Executive Council, 2014). The Asian Development Bank provided policy guidance and support in drafting the legislation, which is part of wider reforms to increase private investment in the delivery of infrastructure and services in PNG. The Act reflects the principles outlined in PNG’s National PPP Policy, which lays out a transparent and predictable process for the PPP project cycle to reduce the risks associated with project development.

An overview of approaches used for providing housing

Countries have adopted various approaches to providing housing. However, these approaches can be classified into two categories, as follows:

- **Government provider approach:** For this approach, government through its agencies is directly involved in constructing houses, developing trunk infrastructure, developing housing policy and implementing it (Ibem & Aduwo, 2012). Some countries such as Singapore are currently using the government provider approach (Sock-Yong & Helble, 2016). In the past, countries such as Brazil, Egypt, Malaysia, and Nigeria used the government provider approach for providing houses in urban areas (Hassan, 2011; Abd Aziz et al., 2008; Abdullahi et al., 2011; Fruet, 2005). In PNG, government provider approach has been used for providing houses especially for government workers (Webster et al., 2016). Currently, the approach used by PNG is not clear because there is a mismatch of roles between the public and private sectors (Ezebilo, 2016). Several authors (such as Hassan, 2011; Aribigbola, 2008; Abd Aziz et al., 2008) have found that the government provider approach has not been able to address the shortage of quality and affordable houses. They also found that the lack of political will, poor funding and distortion in the housing market resulted in failure of the government provider approach in Egypt, Malaysia, and Nigeria.
- **The enabling approach:** This is the approach currently used by most countries to provide housing, especially in urban areas. In this approach, the public sector transfers some of its responsibilities to the private sector following established guidelines that stipulates the specific roles of each party. The public sector facilitates the private sector by providing enabling conditions required for constructing houses. This includes providing trunk infrastructure, enhancing access to land with formal title, and developing housing policy. Others are implementing the policy and monitoring quality of houses constructed by private sector. The role of the private sector is primarily to construct houses that meet minimum standards set by the government. The maintenance of the houses could be the responsibility of the public sector, private sector, or the house owners.

Enabling approach as practiced in some developing countries

Enabling approach in Egypt. The Egyptian government uses incentives to encourage the private sector to participate in the construction of houses (Hassan, 2011). The primary role of the government is to develop standards for controlling the quality of houses that are constructed. The government intervention focuses primarily on:

- Promoting participation of relevant stakeholders in provision of housing by providing incentives to real estate investors and provision of serviced lands for constructing houses according to certain requirements.
- Enabling credits and loans for private property developers.
- Developing laws associated with construction of houses.

Enabling approach in South Africa. This involves government creating enabling environments to stimulate investment in the social housing sector. This is achieved by providing incentives such as cash back rebates, which are tax rebates to private property developers. Regulatory and legislative framework is also provided by the government (National Department of Human Settlements, 2005). The enabling approach takes the form of partnership arrangements that brings together government policy-makers, governmental agencies, community-based organisations and non-governmental organisations.

Enabling approach in Malaysia. The Malaysian government launched several schemes to provide housing. This includes the establishment of the Perumahan Rakyat 1 Malaysia as the catalyst for providing adequate, quality and affordable housing. The Syarikat Perumahan Negara Berhad and the state government play a role in providing affordable housing at the state level. The Malaysian government takes measures to increase

accessibility to affordable housing for targeted groups, strengthen the planning and implementation to manage a better provision of public housing and encourage environmentally-friendly facilities (Daud et al., 2017). The government provides serviced land, and develops and administers housing policy, whereas the responsibility of the private sector is to construct houses.

Enabling approach in Nigeria. The major thrust of the Nigerian National Housing Policy is the development of a housing finance system geared towards ensuring an enabling environment for the generation of housing finance. The National Housing Fund was established in 1992 to address the constraint of mobilising long-term funds for housing development (Olotuah & Taiwo, 2015).

Potential PPP strategies for housing delivery

Various PPP strategies are available for use in providing housing for all income groups (low-income, middle-income and high-income). The PPP strategies are the following :

- Government land-based subsidised housing (GLH). This involves relevant governmental agencies, such as the NHC, providing land to a select few private developers. It is also the responsibility of the governmental agency to provide trunk infrastructure. The private developers are responsible for designing, constructing, and financing the housing stock, which must meet minimum standards set by the government, within a pre-determined cost and timeframe. Upon satisfactory completion of the housing stock, payment is made to the developer by the governmental agency based on the contractual agreement reached by the parties.
- For the GLH to work well in housing delivery, it is necessary for the government agency to develop a checklist of deliverables so that payments are made to the private developer upon satisfactory completion of each deliverable. The beneficiaries of the housing units are expected to pay full worth of the units at the time of handover or pay the amount on monthly basis for an agreed period of time. The money is paid to the government agency. The government is responsible for developing the criteria for eligibility of beneficiaries. Beneficiaries of the housing units are responsible for the maintenance of the units.
- Mixed development cross-subsidised housing (MDH). The government agency is responsible for providing land and trunk infrastructure, whereas the private developer designs, constructs, and finances the housing stock that must meet a minimum standard. However, the developer will not receive payment from the governmental agency. The developer could use the land provided by the agency for constructing houses for only high-income households and provide houses for low- to middle-income groups at another location, which is arranged by the developer. The developer is required to provide houses for low- to middle-income groups (affordable housing) free of cost, whereas sell the houses built for high-income groups. Beneficiaries of the housing units are responsible for the maintenance of the units.
- Annuity-based subsidised housing (ABH). As in the GLH, the government agency provides land and trunk infrastructure. However, in this strategy, the government agency pays the private developer in the form of regular annuity for an agreed period of time instead of paying the developer a lump sum amount upon completion of the housing project. The developer is responsible for the maintenance of the housing stock, whereas the government agency monitors quality of the maintenance work. For this reason, construction risks and maintenance risks are transferred to the developer. A bonus payment from the government to the private developer might be included for each completed housing unit.
- Annuity-cum-capital grant-based subsidised housing (AGH). As in GLH, it is the responsibility of government agency to provide land and trunk infrastructure. This strategy is similar to the ABH strategy; the main difference is that between 40% to 50% of the project cost is paid to the private developer during the construction phase. The remaining 60% or 50% of the project cost is paid as an annuity for an agreed period of time, which might be up to 10 years after completing the project. The developer is responsible for designing, constructing, and financing the housing stock, as well as carrying out maintenance work on the housing units. The annuity payment is linked to the satisfactory performance of the housing stock and maintenance services provided by the developer. The developer might be paid a bonus for each housing unit

paid for by beneficiaries.

- Direct relationship ownership housing (DROH). The key difference between DROH and GLH is that the beneficiaries are required to pay the developer for the housing units. The payment could be in the form of a lump sum at the time of handing over of the housing unit to the beneficiary, or paid monthly. However, the government agency is responsible for providing land and trunk infrastructure, whereas the developer is responsible for maintenance work on the housing units. The government agency in collaboration with the developer could select potential beneficiaries. This strategy is associated with the highest level of financial risk to the developer compared to the GLH, ABH, AGH, and MDH strategies. This is because the developer is responsible for maintaining the housing units, selling completed housing units to potential buyers, sourcing for potential buyers, financing the construction of houses, and making sure that beneficiaries make payments as when due. All these activities cost money and time, and are associated with risks.
- Direct relationship rental housing (DRH). The key difference between DRH and the DROH is that the beneficiaries of the housing units are required to pay rent directly to the private developer for using the units. However, the developer will continue to own the housing units. The developer is responsible for maintaining the units, whereas the government provides land and trunk infrastructure. Of all the PPP strategies that were explored in this review, the DRH is associated with the highest risk transfer to the private developer. This is because, aside from financial risks associated with the DROH, the developer has the responsibility of collecting house rent from tenants weekly. In the event that some tenants refuse to pay rent, the developer might lose money.

PPP strategies we currently have in PNG

- Drawing lessons from the DFHP reveals that the strategy used in PNG is similar to that of DROH. The key difference is that land is provided to the developers at a subsidised amount by the government agency. It is not clear whose responsibility it is to conduct maintenance on the housing units. The houses constructed in Duran Farm might not be affordable to the low-income group and the majority of middle-income group. This is because the land price contributes toward bloating the house sales price. Failure of the developers to sell houses upon completion is strongly linked to the inability of the NHC to play its roles. For example, trunk infrastructure has not been provided and it is not clear whether land title has been issued for each of the subdivisions.
- The case of EDAI Town Housing Development is also similar to the DROH strategy. For example, the developer designed, constructed, and financed all the housing stock. The developer is responsible for maintenance work in the housing estate. However, the developer provided virtually all the trunk infrastructure without the help of the government. One interesting arrangement between the developer and PNG Power in provision of electric power is worth noting: the developer provided PNG Power with materials required for installing power in the housing estate. To recover the cost of the materials, the developer was provided one megawatt electricity, which must be used within five years.

What type of PPP strategy could PNG adopt?

In choosing a PPP strategy from a basket containing different strategies, it is necessary to consider the socio-economic characteristics of PNG. It is also necessary to consider risks and complexities associated with each of the PPP strategies, as well as the housing policy of PNG. Considering that PNG residents are heterogeneous in terms of income, aspiration, and the value they have for different PPP strategies it is necessary for the chosen PPP strategy to reflect this heterogeneity.

In choosing a PPP strategy, it is necessary for us to explore the strategy that has been used in PNG, reasons associated with its failure, and what could be done to make it work. For example, the DROH strategy has been commonly adopted in PNG. The main drawback with the strategy has been the inability of the public sector to play its roles. To move the DROH forward, the public sector must play its roles by providing land for free to selected private developers, as well as providing trunk infrastructure in an orderly and timely manner. However,

in instances where the government does not have the capacity to provide infrastructure, private developers that provide infrastructure could be given tax credit for an agreed length of time so they could internalise the cost associated with the infrastructure. In this case, the government must monitor quality of the infrastructure provided by the developer. To ensure quality, the government must provide minimum standards for private developers to meet.

Considering that buying a house is associated with huge investment, which low-income and middle-income groups may not be able to afford in the short-term, it is necessary to have a PPP strategy that could capture the interest of these income groups. For this reason, it might be necessary to have the DRH strategy as a PPP strategy in PNG. This will help to cater for residents who do not have the financial capacity to buy a house and are willing to rent a house. However, it might be better to have a hybrid of DRH that could provide tenants with the opportunity to own a house after paying house rent for an agreed length of time.

Potential factors that contribute to the success of PPP strategy

Although governments of most countries have huge interest in PPP for providing housing, the implementation of PPP is saddled with some challenges. For this reason, it is necessary for the government agency and private developer that intend to engage in PPP to understand key factors that promote successful implementation of PPP. Several factors have been identified that contribute to the long-term success of PPP. These include:

- Favourable political environment. It is important to note that PPP is a public policy, which is strongly linked to the political setting of a country (Li et al., 2005a). This implies that political support is needed for expenditures associated with PPP to be approved (Jacobson & Choi, 2008). For this reason, political support is necessary for the success of PPP projects. If the political will is not strong, potential investors might be discouraged from participating in a PPP project (OECD, 2008).
- Support of the general public and community. The support of the public and community is necessary in the initial stages of the PPP project. This support might minimise delays in the process of acquiring land, and reduce transaction costs associated with negotiations between PPP parties and landowners. Public support could provide employment opportunities in the PPP project for locals, which could reduce cost of production. To ensure public support, there is a need for public awareness and assurance to the community that good quality services will be provided by the PPP (Yong, 2010).
- Transparency in all PPP stages. This is necessary to build trust between the parties involved in a PPP project. Transparency is strongly linked to constant communication between the parties (Li et al., 2005a). For this reason, it is necessary for the private developer and the public authority to consult regularly for clarifications on the PPP project. There is a need for the public authority to promote the project to erase any negative public perceptions that may be associated with the project.
- Proper risk allocation and risk sharing. To promote the success of a PPP project, it is necessary to identify risks associated with project and share the risks appropriately among the parties involved in the PPP (Ke et al., 2010). The sharing of risks should be negotiated properly and higher level of risks allocated to the party that has the best capacity to mitigate and manage risks (Roumboutsos & Anagnostopoulos, 2008).
- Strong private consortium. For a PPP project to work well, a well-structured private sector firm is needed. The complexities associated with a PPP project often make it difficult for only one private firm to implement the project. For this reason, private firms often come together to establish a consortium and this influences the success of the PPP project. A weak consortium might result in failure of the project. For a PPP project to succeed, the consortium must be technically, operationally, and managerially sound (Zhang, 2005). Government might assist in strengthening local private firms financially and technically to develop their capacity, so they are able to compete with international private firms for local PPP projects (Osei-Kyei & Chan, 2015).

Challenges faced by PPPs

Challenges that might be encountered when implementing PPP projects include high transaction costs associated with negotiations between the public and private sectors, long procurement processes, lack of appropriate skills, unattractive financial market, incomplete risk transfer, and higher end user charges (Grimsey & Lewis, 2007; Li et al., 2005b; Liu & Wilkinson, 2011). In PNG, the challenges include:

- Financial problems. Commercial banks in PNG often find it difficult to provide loan facilities to private developers.
- Bureaucratic problems. There is often huge bureaucracy in the public sector, which might result in lengthy delays in the implementation of PPP projects.
- Unsupportive policy environment. The PNG National Housing Policy 1994 does not match with the current realities in the country.
- Capacity problems. There are shortages of skilled labour to support the house construction industry in PNG. The available workers require more training, which increases financial risk.
- The roles of the public sector and private sectors in the provision of housing are not clear, which might make it difficult to implement PPP projects successfully.
- Shortages of secure land for housing. State-owned land, which is cherished by developers because of security and lower transaction costs, is almost exhausted. Currently, attention has shifted to customarily-owned land. However, it is difficult to access customarily-owned land because it is strongly linked to insecurity of tenure and huge transaction costs.
- Trunk infrastructure is either in poor condition or lacking. Although it is the responsibility of the government to provide trunk infrastructure, this infrastructure is often lacking in areas where houses are to be constructed. In areas where trunk infrastructure is available it is often poorly managed.

Discussion and policy lessons

The findings from this study reveal that the PPP strategy that is most commonly used in provision of housing in PNG is similar to the DROH. This involves the government providing land and trunk infrastructure, and regulating the activities of private developers. The private developer is responsible for constructing houses and selling the houses directly to buyers and conducting maintenance work on the housing units. This is in line with the PPP used in the provision of affordable housing in India (Ministry of Housing and Urban Affairs, 2017). However, this PPP strategy has not been effective in providing housing in PNG primarily due to the fact that relevant governmental agencies, such as the NHC and the Department of Lands and Physical Planning (DLPP), have not been able to carry out their responsibilities in a timely manner.

For example, some houses have been completed by private developers at DFHP, but have not been occupied because trunk infrastructure has not been established (Nao & Ezebilo, 2017). Our findings confirm those of Mazouz et al. (2008) who found, in their study of housing project-based typology, that the public sector is strongly associated with inefficiency and bureaucracy. In a PNG study of prospects and challenges in private sector provision of housing, Ezebilo and Hamago (2017) found that private developers have the potential to effectively provide and manage trunk infrastructure. This suggests governmental agencies such as the NHC and DLPP should develop a strategy to meet all their responsibilities associated with the provision of housing by collaborating with service providers such as PNG Power, Eda Ranu, and Department of Works.

If the intention of the PNG government is to provide affordable housing, the NHC must provide land to private developers for free. This will contribute towards reducing the cost of constructing houses and will consequently reduce house sale prices in Duran Farm. If budget constraints restrict the government from providing infrastructure, a tax credit scheme associated with the provision of trunk infrastructure could be developed so that private developers who provide infrastructure could benefit. However, it is necessary to monitor the quality of infrastructure provided by the private developer, as well as put appropriate value on it to establish the worth of tax credit to be granted.

Considering that buying a house is associated with huge investment, the DRH PPP strategy could assist people unable to afford house sale prices to have access to houses for rent. In addition, most Papua New Guineans might find it difficult to access loan facility through the FHOS because of the upfront payment (equity) they are required to make. According to the DRH PPP strategy, the developer will continue to own the house; however, a hybrid of DRH could be developed so that tenants who have paid house rent for an agreed number of years could own the housing unit. However, there is no provision for strata titles in PNG. For this reason, it is necessary for the DLPP to consider developing strata titles so that tenants who live in apartments in multi-family high-rise houses could have access to secure titles for their apartments. It is important to note that PPP strategies for providing affordable housing in PNG is not reflected in the country's National Housing Policy 1994, which makes it difficult to understand the strategies being advocated by the policy. For this reason, it is necessary to review and update the policy by incorporating potential PPP strategies for providing affordable housing.

The findings from this study show that an enabling approach is the current paradigm used to provide housing in most countries. This entails the public sector transferring some of its responsibilities to the private sector. The primary roles of the public sector in this approach are providing trunk infrastructure, promoting access to land with secure title and developing housing policy, whereas the private sector is responsible for constructing houses that meet minimum standards. Maintenance of the housing units could be by the public sector, private sector, or house owners. For example, in an Egyptian study, Hassan (2011) found the roles of the public sector are primarily to develop standards for controlling the quality of houses constructed by the private sector, develop housing policy, and provide serviced land for constructing houses. In Malaysia, the government provides quality control services and incentives to facilitate private developers (Abdullah et al., 2011). In Nigeria, the National Housing Policy focuses primarily on the development of housing finance, which has resulted in the establishment of the National Housing Fund for providing long-term loan facility to the private sector (Olotuah & Taiwo,

2015). However, the roles of the public sector and private sector are not clearly delineated in the PNG National Housing Policy 1994, which contributes to the mismatch of roles. For this reason, it is difficult to identify the approach being used in the provision of housing in PNG. To move the PNG housing sector forward, it is necessary to review and update the National Housing Policy 1994 by delineating the roles of the public and private sector.

PNG has several housing schemes that have the potential to reduce the housing affordability problem, especially in cities such as Port Moresby. However, the schemes have been poorly implemented. The DFHP is an example of a good housing scheme that has not followed the tenets of orderly housing development. The District Housing Program is another good scheme that has the potential to reduce the housing problems in towns; however, it is not clear why this Program has not been fully implemented in all the districts in PNG. This highlights the need to develop an effective framework for monitoring housing schemes. There is also a need for a strategy to improve the effectiveness of the NHC and the Department of National Planning and Monitoring in monitoring housing projects, as well as reducing the bureaucracy found there. For the case of the District Housing Program, money should be released in instalments following an established guideline. The instalments could be divided across three phases and money released to the developers or project managers only upon satisfactory completion of each phase.

In developing a PPP housing project, it is necessary to consider challenges that might bedevil the project. This could provide us with the opportunity to explore strategies that could be used to address the challenges. For example, issues associated with transaction costs could be reduced by developing a guideline that stipulates the roles of the public and private sectors and improves communication between them. The guideline must indicate how costs and benefits should be shared between the parties involved in the PPP project (Liu & Wilkinson, 2011). The PNG government could establish a mortgage financial institution that could provide long-term loans to private developers to assist them construct more houses, which is in line with the practice in Nigeria (Olotuah & Taiwo, 2015). Unclear roles of the public and private sector often impinge on the activities of PPP. This highlights the need for the public and private sectors to reach an agreement, before the commencement of the PPP project, about the roles each sector should play. It also highlights the need for the roles of the public and private sectors in PPP housing projects to be outlined in the updated PNG National Housing Policy so that the policy can be a reference document for parties to consult to gain understanding of PPP arrangements.

The findings reveal there are several critical factors that must be considered for a PPP project to be successful. Most of the housing projects in PNG are established without much public awareness, which makes some of the projects unpopular. This highlights the importance of involving relevant communities in all stages of the project, which has the potential to engender community support for the project (Yong, 2010). In addition, it is important for the public and private sectors to promote transparency in all stages of the PPP project. This has the potential to improve trust and sharing of valuable information between the parties involved in the PPP project. The case of DFHP is an example of a project where transparency appears to be compromised. The contractual agreement was that the public sector would provide trunk infrastructure, whereas the private developers would construct houses. The developers have done their part, but the public sector has not done their part. This has made the developers lose money because their money is tied to houses that have been completed but not sold because of lack of infrastructure.

For PPP projects to be successful in PNG, transparency must be promoted in every aspect of the project (Li et al., 2005a). The private sector has greater potential than the public sector to manage risks because the private sector is often more influenced by market forces (Ke et al., 2010). This highlights the need for the private sector to be responsible for activities that are strongly linked to high level of risks. However, in PNG the public sector dominates the housing sector and consequently shoulders greater risk. This could be a reason that providing adequate, quality, and affordable housing in PNG has continued to be problematic. If the housing sector in PNG is to move forward, the private sector needs to be more involved in financing housing projects.

Policy lessons for PNG government

- PPP strategies for providing housing in PNG must be streamlined. Although PNG has a Public Private Partnership Policy and a Public Private Partnership Act, the PPP strategies for providing affordable housing must be modified in line with the literature, including the need for the PNG Government to supply land for free to selected private developers. To move PNG toward reaping benefits from PPP, it is necessary for the NHC, DLPP, Department of Treasury, Department of Planning and Monitoring, and other relevant stakeholders to develop PPP strategies that could be applied to provide housing in the country. This could be informed by lessons learned from current practice.
- The National Housing Policy 1994 must be reviewed and updated. The current housing policy does not meet the realities in PNG. The socio-economic conditions and the demography of the country, as well as preferences and demands of residents of PNG have changed in the 23 years since the National Housing Policy was introduced in 1994. For these reasons, it is necessary to review and update the policy to capture the changes.
- What are the roles of the public and private sectors in the housing sector? Currently, the roles of the public sector and private sector in the provision of housing are not clear, which makes it difficult to identify the approach being practiced in PNG. This results in a confused situation and a mismatch of roles, which constrains the supply of quality and affordable houses. To move the housing sector forward, it is necessary to delineate the roles of the public and private sectors. This can be captured in the new policy document that emerges from the current review of the National Housing Policy 1994.
- It is not clear whether PNG adopts the provider or enabling approach in providing housing. The National Housing Policy 1994 does not reveal the specific approach being advocated by the State, which tends to generate huge uncertainties in the housing sector and discourages private investment in the sector. It is necessary to specify the approach that PNG has adopted for providing housing to guarantee investment and long-term land use planning.
- Greater effort should be geared towards unlocking more customary land for housing. Access to land with secure title is one of the most important barriers to housing development in PNG. This is because State land, which is often preferred by property developers, is almost exhausted and attention has been shifted to customarily-owned land. However, most customary land is not formally registered and does not have a secure land title. The National Land Development Program succeeded in developing systems and processes for accessing customary land in PNG. To move PNG forward, it is necessary for the State, through its agencies, to develop an effective and efficient customary land administration system to supply land to the formal land market.

Conclusions

This paper focuses on PPP strategies that potentially could be used to provide quality and affordable housing in PNG, challenges to implementing a PPP project, and factors that contribute to the success of a PPP project. The findings revealed that the DROH and DRH PPP strategies might be most applicable to PNG conditions. However, for these strategies to be implemented properly it is necessary to delineate the roles of the public sector and private sector and for each of the sectors to adhere to their own roles. This will require reviewing and updating the PNG National Housing Policy 1994 to reflect the approach advocated for providing housing and the roles of the public and private sectors. The PNG Government has indicated its keen interest in PPP by developing the National Public Private Partnership Policy 2014, and the Public Private Partnership Act 2014. However, PPP housing projects in PNG are constrained by challenges such as bureaucratic problems in the public sector, unsupportive policy environment, financial problems, shortage of land with proper title, shortage of skilled labour, and inadequate trunk infrastructure. To promote the success of a PPP project, it is necessary to promote transparency in the PPP project process, and to properly distribute risks associated with the project between parties that are involved in the project. Other requirements include establishing public and political support for the project and a strong private consortium.

The findings show that PNG has some impressive housing schemes that have the potential to increase the pool of available houses, which should lower the housing affordability problems the country is experiencing. However, the inability of the public sector to meet its responsibilities has been the major drawback. To correct this anomaly, it is necessary to improve effectiveness and efficiency in the public sector by developing a framework to minimise the bottlenecks associated with the sector. Orderly development must be promoted by establishing trunk infrastructure before private developers construct houses. Access to land with proper title for development should be promoted by improving the land administration system. Findings of this study contribute to greater understanding of potential ways that PPPs could be applied to increase the supply of quality and affordable housing in PNG. Findings of this study also should contribute to the review of the PNG National Housing Policy 1994, and assist policy-makers, urban development managers, and planners to consider PPP strategies and make informed decisions regarding housing delivery.

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Appendix 1

Challenges in provision of housing and government's housing project initiatives

The provision of affordable housing in major cities of Papua New Guinea (PNG) such as Port Moresby is becoming a growing problem. To address the problem, the government of PNG has introduced several housing initiatives. For example, the Duran Farm Housing Project (DFHP). Several private housing developers have also emerged to supply houses to match with demand. However, factors that restrict private developers' potentials to supply houses to the housing market is not well understood. It is also necessary to understand the framework associated with the DFHP and potential ways to improve the effectiveness of the framework.

We are a group of researchers from the PNG National Research Institute that are interviewing people involved in large scale housing projects on the challenges associated with the construction and sale of houses.

You are among the people that have been selected for interviews.

We assure you that your responses will be held strictly in confidence.

We thank you in anticipation for your cooperation.

1. In your opinion, what are the key challenges associated with the construction and sale of houses that your organisation have been facing.
2. Has your organisation been able to cope with the challenges that you stated in question 1? Yes/No. If "Yes", explain.
3. In your opinion, would you say that the government has contributed in providing enabling environment for your organisation to construct and sell houses? Yes/No. If "Yes", explain.
4. If you are involved in the construction of houses at the DFHP, explain the arrangement between your organisation and government in the provision of houses, especially the specific roles of your organisation and that of the government.
 - 4a. In your opinion, what are the reasons that some houses at DFHP have been completed but not occupied.
5. If you are an official of the National Housing Corporation, describe the development framework that has been applied in the implementation of the DFHP and explain whether the framework has been effective.



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