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Original Paper

Cultural Lineage Constraints to Public Housing Affordability in Papua New Guinea

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Abstract

This paper investigates the impact of cultural lineage (wantokism) in Papua New Guinea on public housing affordability and sustainability in the country, using the two largest cities of Port Moresby and Lae as case studies in a country that has maintained strong cultural bonds of families, clans and tribes for centuries to support each other in the Melanesian way. In principle, public housing units are subsidised by government and other public institutions to cushion the harsh effects of inflation and property market externalities on low- and middle-income civil servants who can hardly afford market rentals. However, other factors such as cultural lineage (wantokism) tend to wipe off the intended benefits of the so-called subsidy. A study of eight (four from each city) randomly selected public housing areas in the two cities of Port Moresby and Lae was carried out in 2016witha representative, stratified random sample of 157 sitting tenants. The stratification of the population was based on low, medium and high income groups using the country's public servants' performance salary scale 2012-2013, which is a secondary database. Data collection instruments were structured questionnaires, formal and informal interviews combined with simultaneous field observations through transact walk. Based on a theoretical framework gleaned from the General Systems Theory, findings indicate that the "cultural lineage" of the indigenous people of PNG has a significant negative impact on public housing affordability exacerbated by adverse economic factors including low income and low housing allowances paid to public housing tenants by public employers, including the government. The study also reveals that cultural lineage has a significant negative impact on the aggregate income of households due to extended family size, high incidence of family members who are not gainfully employed, high dependency rate in the extended families with expected responsibilities as guardians,

marital status of many tenants with many children who attend schools, and the low educational qualifications of some tenants with daunting commitments to the lineage group. The paper makes strategic recommendations including speedy codification of PNG customs, mass empowerment, and improved economic emancipation of the general public for purposes of raising housing affordability levels in PNG in general and in the two cities of Port Moresby and Lae in particular.

Keywords

cultural lineage, wantokism, Melanesian culture, public housing, affordability, low income, PNG

1. Introduction

This study is an investigation of the impact of cultural lineageor customs manifesting as *wantokism* on the affordability of public housing units in Papua New Guinea, with focus on the two largest cities of Port Moresby and Lae. According to the World Factbook (2018, 2012), it is estimated that there are over a thousand cultural groups and customs in Papua New Guinea with more than eight hundred and sixty different languages. As a result of this diversity, many styles of cultural expression have emerged where every group has created its own expressive forms in costumes, art, music, singing, dancing, weaponry, architecture and many more. The country has an estimated population of about 8.1 million people whose actions and lives are regulated by their customs (Worldbank.org, 2016). Customs and customary law had existed long before the country's colonisation, as the sets of rules and practices that have governed the native people of PNG in their own way of life and their roles and responsibilities towards each other within the country. In Papua New Guinea, customs regulate and maintain social order within a community and even to the extent of governing the lives of people outside their communities, towns and cities. Till today, custom is still very strongly practiced and is integrated into the constitution and other laws of the country as part of the formal legal system of the country.

In addition to the recognition by the constitution of PNG, customary landownership and customary marriage are also recognised by the formal legal system of the country. Customary land, which currently accounts for about 86% of all land in the country, according to some recent studies, is owned by lineage groups, while the remaining 14% is shared by state land and private land (Chandler, 2011). Customary land ownership in PNG is practiced through customary lineage system of ownership rights held by families, tribes and clans, and is administered by the tribe or clan leaders under customary law (Anderson, 2008). The family, tribe or clan allocates the use of the land to each family or individual member of the group. According to Ausaid.gov (2009), customary land remains the dominant form of land tenure in most countries of the Pacific islands and areas within the Pacific region, where distinct customary systems of land tenure have evolved over time. In some of these countries, there may be many different types of customary tenure. With the diversity in language, culture and custom, PNG has been continuously inundated with housing affordability problems particularly in the urban centres. As revealed in some previous studies (e.g., Miemis, 2012; Logan, King, & Wright, 2008), most companies are made up of a tribe or a network of tribes that comprises groups of 20 to 150 people where everyone

knows everyone else or at least knows someone in the group. It is a reality where "fish swim around in schools, birds fly around in flocks and people gather in tribes; where tribes are more powerful than teams, companies or even superstars."However, the tribes' key leverage points have not been mapped until now (Miemis, 2012).

A "lineage" has been defined as a unilineal descent group that can demonstrate its common descent from a known apical ancestor. Unilineal lineages, as found in PNG, can be matrilineal or patrilineal, depending on whether they are traced through mothers or fathers respectively, but whether matrilineal or patrilineal descent is considered more significant differs from culture to culture. Aclanis generally a descent group claiming common descent from an apical ancestor. Often, the details of parentage are not important elements of the clan tradition. In anthropology, kinshipis the web of social relationships that form an important part of the lives of all humans in all societies (William, 2012; Fox, 1967), although its exact meanings even within this discipline are often debated. Broadly, kinship patterns may be considered to include people related by both descents, i.e., social relations during development, and by marriage. Human kinship relations through marriage are commonly called "affinity" in contrast to the relationships that arise in one's group of origin, which may be called one's descent group.

International measures of housing affordability as indicators were first developed in 1977 by Weicher in the United States of America where inflation as well as interest rates were considered as the main variables in the model (Hepsen et al., 2011, p. 3). The idea behind measuring the affordability of housing is to basically determine the burden which lies on the shoulders of the households caused by housing costs. These costs are the rental rates, selling prices, mortgage repayments, housing loan repayments, etc., which stress the income of the households (Australian Housing and Urban Research Institute (AHURI), 2010). Affordability is measured in a variety of ways depending on the jurisdiction or country where one is undertaking the measurement. Consequently, different measurements have been employed by various institutions in different countries in determining housing affordability levels and the results vary widely (Meen, 2018; Lau, 2001). According to some researchers (e.g., Meen, 2018; Muscatelli, et al., 2004; Yip, 1995), three main approaches have been identified for measuring housing affordability, namely: normative, behavioural and subjective approaches.

Normative approach is the measurement that defines the limits and norms of housing affordability in terms of certain threshold values. These threshold values are normally the housing costs, which should not exceed a certain percentage of a household's income, while the remaining income after the housing costs should be above the poverty line. This normative approach is referred to as the ratio measure-residual income approach to affordability measurement. On the other hand, the behavioural approach refers to the people's housing consumption behaviour. This approach refers to the normal housing decisions, which a household makes in spending their income on housing goods as well as other necessities of life: food, health, education, etc. Finally, the subjective approach is another method of measuring affordability. This approach refers to the household's own evaluations of their affordability situations. The approach is used to determine the threshold level of the household's affordability level

assuming that the individual is the best judge of their own situation (Meen, 2018; Lau, 2001).

The purpose of this paper is to apply the behavioural approach in identifying and analyzing the linkages between cultural lineage in PNG (wantokism) and public housing affordability in the two major cities of Port Moresby and Lae. The paper is divided into four main sections. After the introduction, which includes the nature of the research problem and the conceptual framework in section one, section two presents the methods applied for the study. The results comprising answers to the research questions are then presented in section three, while the concluding section four summarises the paper along with the policy implications of the results.

1.2 Nature of the Problem and Paper's Contributions to Knowledge

Broadly speaking, sitting tenants in public housing units in the two surveyed cities in PNG have been saddled with the problem of housing affordability mainly due to the impact of cultural practices and norms related to the lineage system that is practised by every household in both rural areas and urban centres of PNG, although attention in this paper is on urban centres that are densely populated. The lineage system, as practised, is identified by this study to be the major driver of the housing affordability dilemma faced continuously by public service employees with relatively low wages. Papua New Guinea is a country with diverse cultures and customs and is one of the nations in the Melanesian Group of the Pacific Island nations. It is a country where less than 15% of the land is shared by state land and privately-owned freehold land compared to about 86% of the total land held under customary tenure by groups of tribes and clans that are *de facto* recognised by both the constitution and customary law.

The households in the two study areas comprise individuals who are aligned to the same lineage group in each customary setting (village) where the household head or the spouse originates from. Our literature review and field investigations both confirm that family bonds in PNG (extended networks of family ties) link back to the cultural lineages of tribalship and clanship in the rural communities of the household head or spouse where customary land is owned by tribes or clans. These are strong cultural bonds that are still practised today in both the rural communities and urban centres of the country. There may be cultural differences between different households due to the different areas each tenant or household head and spouse originates from, but the "extended family culture or lineage" is essentially a norm in all the areas of PNG that permeates all aspects of peoples' lives today.

Thetraditional lineage group's culture has incrementally blended itself with the emergent and modern PNG society's lifestyle due to the former's significance to the lives of the indigenous people through the generations. Unfortunately, this cultural practice has been identified in this paper as a major driving force behind the seeming intractable public housing affordability dilemma facing most public service tenants in PNG today. Accordingly, the following research questions have been formulated and answered in this paper as a means of contributing to the knowledge of the subject of housing and culture, bearing in mind the proposition that resources are cultural appraisals (Gregory, 2009; O'Riordian, 1989):

a) What is cultural lineage and how significant is its impact on public housing affordability in PNG today?

b) Does cultural lineage significantly affect the income of households in PNG cities?

c) How can we resolve the seeming intractable public housing affordability problem in PNG?

1.3 Conceptual Framework

In this paper, we argue that there is a strong relationship between public housing affordability and cultural lineage in PNG. Based on this relationship, our paper gleans from the principles of the General Systems Theory (Heylighen & Joslyn, 2018; Kuhn, 1974) in developing a conceptual framework that guides data capture and subsequent data analysis. According to Heylighen and Joslyn, and Kuhn, a system is any pattern whose elements are related in a sufficiently regular way to justify attention. "An *element* is any identifiable entity, while a pattern is any relationship of two or more elements," Kuhnargues. At a more practical level, *Systems Analysis*—a practical application of *Systems Theory*—is the study of sets of interacting entities with the aim of solving the multi-faceted problems of the system itself (http://www.swemorph.com/pdf/anaeng, 16 December, 2018). It is also "the process of studying a procedure or business (e.g., cultural appraisal of housing resources) in order to identify its goals and purposes and create sub-systems or networks of procedures that will achieve them in an efficient and sustainable way".

The conceptual framework comprises seven variables (sub-systems) that are rooted in the customs and culture of the local people of PNG, which engender unaffordable levels of public housing consumption (the main system) in the country. The framework demonstrates how a tenant in a public housing unit who is saddled with lineage bonds is economically and socially inhibited by the various housing needs of the lineage group, which eventually result in public housing affordability dilemma (Figure 1).

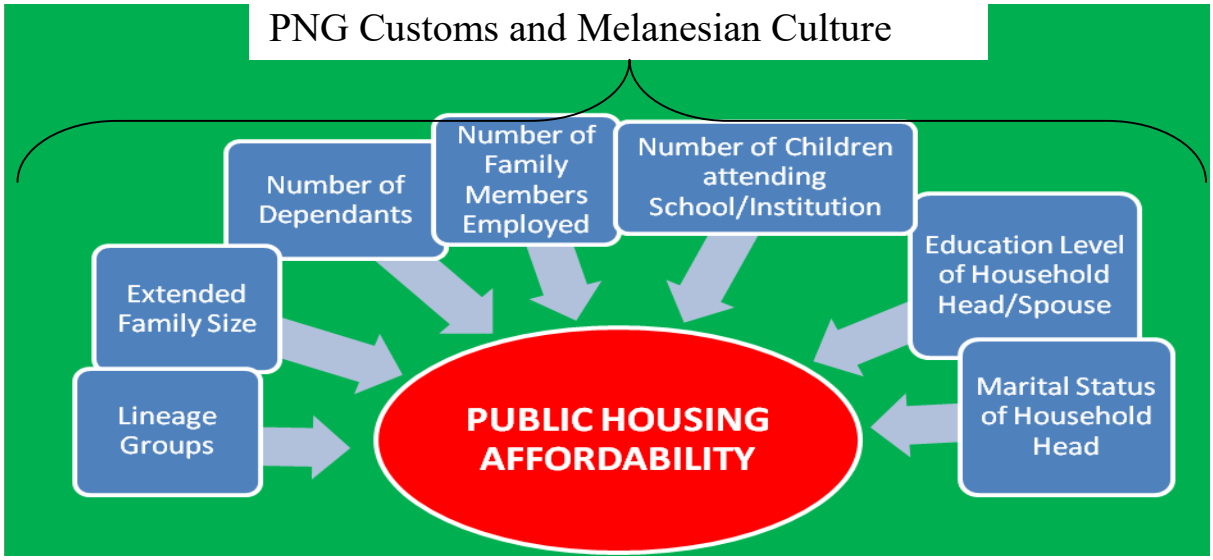

Figure 1. Conceptual Framework of Cultural Lineage and Public Housing Affordability in PNG

Source: Authors, 2018.

Accordingly, the main system adopted in this paper is *Public Housing Affordability*, which is highly impacted by a set of seven sub-systems. The seven sub-systems are as follows: (i) Lineage groups, (ii) Marital status of the household head or spouse, (iii) Education level of the household head or spouse, (iv) Extended family size, (v) Number of extended family members gainfully employed, (vi) Number of dependants in the extended family, and (vii) Number of children or wards attending school or institution. There is no order of importance of the sub-systems as they co-exist in a fussy manner and impact public housing affordability simultaneously. Yet, for purposes of maximum synergy, both the main system of *Public Housing Affordability* and the seven sub-systems should work in unison and in a balanced manner.

2. Methods

Secondary and primary data were utilised for the study. Secondary data was gathered from anthropological publications, housing policy, customary case law records, local and statutory authorities and financiers such as the National Housing Corporation, Australian and New Zealand Banking Group (ANZ), Bank of South Pacific (BSP) and the Department of Lands and Physical Planning (DLPP). Primary data was gathered from house-to-house administration of questionnaires and formal and informal interviews conducted in 2016 with a representative stratified random sample of 157 sitting tenants living in eight public housing areas of Port Moresby and Lae cities. In addition, general field observations were carried out through transact walking around the eight selected housing areas. The housing units were constructed and are still owned by the National Housing Corporation (NHC), which is a parastatal under the federal government of PNG.

The survey questions that the tenants were asked to answer focused on the perceptions of the tenants concerning the various factors or variables that influence the affordability of a home. Selected officials of banks and government officials (stakeholders) were also interviewed using s different set of questionnaires for recording perceptions concerning factors governing mortgage loan approval for civil servants, tenant selection and tenant mix. The other method of data collection used was general field observations conducted at about the same time with the administration of questionnaires. This method was applied using transact walk around the eight public housing areas in the two cities. The physical observations made included those of the physical conditions of the facilities in the housing units, the access roads, fencing, street lighting, pipe-borne water and neighbourhood quality. The sampling frame for the study was identified as 1,184 tenants in Port Moresby and 750 in Lae resulting in a grand total sample of 1,934 tenants for both cities (Table 1). The study adopted the stratified random sampling technique because the sampled population had to be segmented into three specific groups, namely: (i) the low-income group, (ii) the middle-income group, and (iii) the high-income group, relative to the levels of tenants' incomes in line with the public servants' performance-based salary scale of 2012-2013 for PNG civil service (Table 2), which is still used till today.

Table 1. Sampling Frame and Sample Size for the Study, 2016

Study Area	Total Number of Housing Units	Sample Size Used		Percent of Successfully Completed Surveys and Interviews
		Surveyed or Interviewed	Successfully	
Port Moresby	1, 184	100	81	52
Lae	750	115	76	48
Total	1, 934	215	157	100

Source: Questionnaire Survey, 2016.

Table 2. Public Servants' Performance-Based Salary Structure for 2012 and 2013, PNG Civil Service, PNG

2012						2013				
GRADE	1	2	3	4	5	1	2	3	4	5
PS20	79143	83540	87,937	92334	96731	79143	83540	87,937	92334	96731
PS19	64779	68378	71,977	75576	79175	64779	68378	71,977	75576	79175
PS18	52854	55791	58,727	61663	64600	52854	55791	58,727	61663	64600
PS17	44759	47245	49,732	52219	54705	46,117	48679	51,241	53808	56365
PS16	37,272	39,342	41,413	43,484	45,554	39,828	42040	44,253	46466	48678
PS15	33,561	35,426	37,290	39,155	41,019	35,894	37888	39,882	41876	43870
PS14	52854	32,096	33,785	35,474	37,164	32,550	34359	36,167	37975	39784
PS13	27,940	29,492	31,044	32,596	34,148	29,936	31599	33,262	34925	36588
PS12	25,791	27,224	28,657	30,090	31523	27,658	29194	30,731	32268	33804
PS11	22,940	24,215	25,489	26,763	28,038	24,636	26004	27,373	28742	30110
PS10	20,054	18,573	22,282	23,396	24510	21,577	22,775	23,974	25173	26371
PS09	17,596	21,168	19,551	20,529	21506	18,971	20,025	21,079	22133	23187
PS08	15,473	16,332	17,192	18,052	18,911	16,721	17,650	18,579	19508	20437
PS07	13,706	14,468	15,229	15,990	16,752	14,848	15,673	16,498	17323	18148
PS06	12,155	12,830	13,505	14,180	14,856	13,203	13,937	14,670	15404	16137
PS05	10,815	11,416	12,017	12,618	13,219	11,784	12,438	13,093	13748	14402
PS04	9,693	10,232	10,770	11,309	11,847	10,594	11,182	11,771	12360	12948
PS03	8,752	9,238	9,724	10,210	10,696	9,596	10,129	10,662	11195	11728
PS02	7,927	8,368	8,808	9,248	9,689	8,722	9,206	9,691	10176	10660
PS01	7,461	7,876	8,290	8,705	9,119	8,228	8,685	9,142	9599	10056

Source: PNG General Order 13, Salaries and Allowances, 2012.

This stratification process was cross-checked with records obtained from the NHC officials based in the two cities for purposes of verifying the physical locations of the low- and medium-cost public housing units in the selected suburbs. This action facilitated the physical identification of the actual locations of the sampled tenants. The total population was also corroborated with data provided by the National Housing Corporationas representing the current stock of public housing units in the two cities and which are under the direct management of the corporation at the time of our surveys. The sample was then randomly selected from each of the suburbs of the two cities for the study following the stratification processes. Finally, sampled tenants of the housing units that had been sold by the NHC (landlord) provided information on the rents they were paying before the sale of their rented homes, which were then compared with the current rental data. Table 3 indicates the old and revised public housing rents for Port Moresby.

Table 3. Old and Revised Rental Rates of some Public Housing Units in Port Moresby (Based on BSP's Exchange Rates as of 23 May 2018)

Type of property	Description	Old Rents (the 1970s and 80s)	Current Rents, 2018
High-Cost House	3 Bedrooms	K23/fortnight (US$5.92)	K220/fortnight (US$56.65)
Low-Cost House	2 Bedrooms	K5.30/fortnight (US$1.36)	K44/fortnight (US$39.66)
High-Cost Flats	3 Bedrooms	K23/fortnight (US$5.92)	K220/fortnight (US$56.65)
High-Cost Flats	2 Bedrooms	K17.50/fortnight (US$4.51)	K154/fortnight (US$11.33)

Source: Paulisbo, M. (2013), NHC Overview of Property Management Division, Port Moresby.

3. Results

3.1 A Reminder of Our First Research Question: What Is Cultural Lineage and How Significant Is Its Impact on Public Housing Affordability in PNG Today?

As already indicated above, a "lineage" has been defined as a unilineal descent group that can demonstrate its common descent from a known apical ancestor. Unilineal lineages, as found in PNG, can be matrilineal or patrilineal, depending on whether they are traced through mothers or fathers respectively. On this basis, it is hypothesized that lineage system in PNG exerts a high degree of impact, which is a constraint to public housing affordability in the country. We appraised the lineage system using the variable of marital status of the tenants in the two cities of Port Moresby and Lae to answer the first research question as follows:

3.1.1 Marital Status of the Tenants

This key factor contributes to the housing affordability problem. Our findings indicate that tenants who are single, divorced or widowed tend to be less stressed in comparison to those who are married. As indicated in Table 4, 89.2% of the tenants are married. This group of tenants tends to face housing affordability problems linked to their higher responsibilities to lineage groups connected to both the

tenant and their spouse. In other words, a single, divorced or widowed tenant is less stressed by his/her lineage because he/she is only linked to the parents' lineages (matrilineal or patrilineal—Figures 2 and 3). Tenants who are single have a lower burden as they are only attached to their parent's lineage groups (matrilineal or patrilineal) alone. They are responsible to those lineage group members from their parent's lineages. They are less stressed with regards to the expenses that are exerted upon their income to support their single lineage group members.

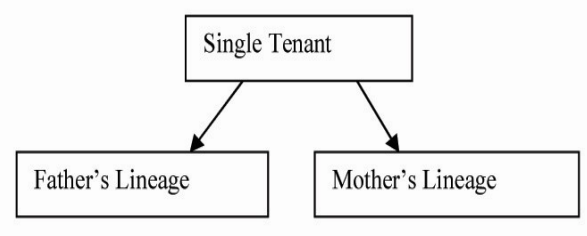

Figure 2. The Lineage of a Typical Single Tenant

Source: Authors, 2018.

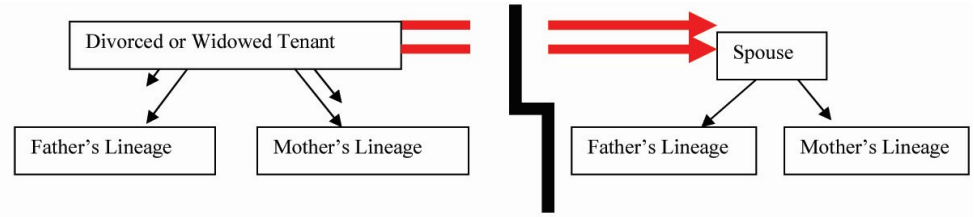

Figure 3. The Lineage of a Typical Divorced or Widowed Tenant

Source: Authors, 2018.

All things being equal, *unencumbered* tenants—i.e., tenants having no *carry-over obligations* from previous marriage (s)—and who are divorced or widowed will tend to have lesser risks of stress upon their income than currently married tenants. If they have no encumbrance (e.g., dependants like children) from previous marriages, then theoretically they will tend to be like those who are single. Usually, their lineage responsibilities are disengaged (broken red arrows in Figure 3) following a change in their marital status as illustrated with the black thick line (Figure 3). They revert to the responsibilities of single tenants as they now have responsibilities to their parental lineages after their marital status changed from being married to either divorced or widowed, without children.

However, those tenants who are married tend to have additional responsibilities to their spouses' lineages. Figure 4 shows that the responsibilities to lineage groups, which each household bears, will invariably be a burden on the household income, thus adversely impacting the affordability of their rented home. While their marriage endures, married tenants are normally responsible for the upkeep of lineage groups as illustrated in Figure 4 (lineage of married tenants).

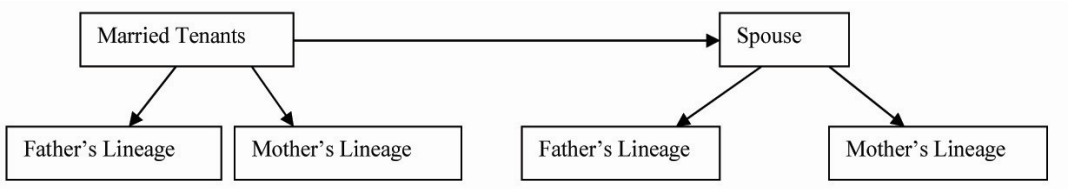

Figure 4. The Lineage of the Married Tenants

Source: Authors, 2018.

Tenants who are married tend to have very high burden since their responsibilities are spread out to their spouses' lineages as well. Married tenants must support the lineage members of their own lineage groups and those of their spouses' lineage. This means that their income is spread out to support the members from their spouses' lineage groups, thus exerting a higher stress on their income (Figure 4).

Table 4. Marital Status of the Tenants

Marital Status	No. of respondents	Percent
Single	9	5.7
Married	140	89.2
Divorced	**5**	3.2
Widowed	3	1.9
Total	157	100

Source: Authors, 2016.

Empirical evidence from the study (Table 4) indicates that there are 140 tenants (89.2%) who are married and living in the sampled public housing units, with higher responsibilities as illustrated in Figure 4. This is the main reason why the majority of the public housing tenants are facing housing affordability issues even though the housing units are highly subsidised by government. There are only seventeen (10.8%) tenants who are either single, divorced or widowed, with lesser responsibilities to their parents' lineage groups alone, assuming no encumbrance from previous marriage(s) in the cases of divorced or widowed tenants. In other words, the majority of the sampled tenants are those who are married (89.2%), followed by those who are single (5.7%), while those who are divorced (3.2%) or widowed (1.9%) are the minorities, who are burdened with lineage housing needs to varying degrees. The majority who are married are highly burdened by their marital status in the "Melanesian" way or cultural *wantokism* system. This means that, being a married public servant in PNG even with a higher educational qualification puts pressure on the household head or spouse to apply their salaries for higher responsibilities over both male relatives and female relatives (Figure 4) and the spouse's lineage. Consequently, as confirmed by previous studies (e.g., Motoro, Babarinde, & Holis, 2017), many civil

servants with high educational qualifications in PNG have resorted to living in squatter settlements where housing costs are cheaper and affordable. Therefore, the present study's finding about marital status within the context of lineage or culture is very striking as it is a major determinant of public housing affordability dilemma in PNG.

The chi-square test performed to establish the nature of the relationship between the variables of marital status and public housing costs yielded a positive relationship between the two variables (Table 5). The relationship between the marital status and tenant's housing costs is significant: $\chi^2 = 345.293$, DF = 3, P = 0.000 for marital status, and $\chi^2 = 156.834$, DF = 23, P = 0.000 for housing costs. The "P" value is less than 0.001; therefore, the relationship is statistically significant (Table 5).

Table 5. Chi-Square Test for the Relationship between Marital Status and Housing Costs

Test Statistics		
	Marital Status	Other Costs
Chi-Square	345.293[a]	156.834[b]
df	3	23
Asymp. Sig.	.000	.000

Source: Authors, 2018.

3.2 A Reminder of Our Second Research Question: Does Cultural Lineage Significantly Affect the Income of Households in PNG Cities?

In order to answer the second research question, we investigated three parameters of cultural lineage in PNG. The results are as follows:

3.2.1 Number of Children/Wards in Schools

The number of children per household that attend various schools is another determinant of public housing affordability dilemma faced by the low- and medium-income households in PNG cities. The number of children or wards that a tenant has (Table 6) who attend schools also tends to contribute to the housing affordability problem. In this context, children are not only those given birth to by the household head and spouse, but they also include other children from the lineage groups as indicated in Table 6 where tenants who are single also have wards/children who attend schools and institutions in the cities or within the country. Externally funded children or children who attend schools abroad on scholarships are not covered by this study based on the presumption that low- and medium-income public housing tenants cannot meet the high costs involved. However, daily expenses such as transport fares to and from schools, lunch expenses and tuition fees are a combined factor that contributes to the housing affordability problem.

Table 6. Number of Children Attending Schools or Tertiary Institutions

No. of children	No. of tenants	Percent
0	1	0.6
1	76	48.4
2	50	31.8
3	20	12.7
4	8	5.1
5	2	1.3
Total	157	100

Source: Authors, 2016.

The findings indicate that 48.4% of the current tenants in the public housing units have at least one child attending schools (Table 6), while 50 tenants (31.8%) have two children that attend schools or tertiary institutions around the country. In addition, 20 tenants (12.7%) have three children who attend either schools or tertiary institutions around the country while another 8 (5.1%) of the tenants have four children who attend either schools or tertiary institutions. Only 1.3% of the tenants have 5 children who attend schools or tertiary institutions in the country, while only one tenant (0.6%) does not have any child who attends a school or higher institution. The results have illustrated that nearly all the tenants (99.4% of the sample), regardless of their marital status, have children who attend schools or tertiary institutions in the country. This result is inclusive of those who are single tenants but are responsible for children of their lineage group(s). The Pearson's correlation test carried out to find the relationship between tenants' income and the number of children who attend schools and tertiary institutions in the country produced a weak but positive correlation between the two variables of a two-tailed Pearson's correlation test. The relationship is statistically significant at 0.05 (Table 7) given that the correlation coefficient (r) is 0.166 and the significance (p) is 0.038 (two-tailed).

Table 7. Pearson's Correlation Test Results for Income and Children Attending Schools or Tertiary Institutions

Correlations

		Income	Children Who Attend Schools/Institutions
Income	Pearson Correlation	1	.166*
	Sig. (2-tailed)		.038
	N	157	157

Children Who Attend Schools/Institutions	Pearson Correlation	.166*	1
	Sig. (2-tailed)	.038	
	N	157	157

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

Source: Authors, 2016.

3.2.2 Number of Family Members Employed

Provided they earn reasonable incomes above the minimum wage, the number of family members who are gainfully employed in a lineage group may alleviate the burden of a household with regards to the housing affordability problem in cities. The lower the aggregate net income of family members that are employed, the heavier the burden of the household in meeting their housing and other costs like food, medical services, utility bills, etc., and vice-versa. Our study produced the following results:

Table 8. Number of Family Members Employed

No. family members employed	No. of households	Percent
0	1	0.6
1	55	35.0
2	76	48.4
3	20	12.7
4	4	2.5
5	1	0.6
Total	**157**	**100**

Source: Authors, 2016.

Table 8 indicates that 48.4% of the current public housing tenants have two members of the family who are employed by either the public or private sector. Another 35% of the tenants have only one member of the family employed; 12.7% of the tenants have three members of the family employed and only 2.5% tenants indicated that four family members are employed. Only 0.6% tenants indicated that none of the family members is employed while another 0.6% indicated that five family members are employed. These results illustrate that most of the tenants have between 1 and 3 members employed (Table 8). Generally, therefore, tenants with higher numbers of dependants but only a few members employed carry higher financial burdens than those with fewer dependants and more family members that are gainfully employed.

Further statistical analysis was done to determine the relationship between income and number of family members employed (Table 9). Findings indicate a positive, but very weak correlation (0.153)

between the two variables (two-tailed). The relationship, however, is not statistically significant at 0.05 (r = 0.153, p = 0.056).

Table 9. Pearson's Correlation Test for Income and Family Members Employed

Correlations			
		Income	Number of Family MembersEmployed
Income	Pearson Correlation	1	.153
	Sig. (2-tailed)		.056
	N	157	157
Number of Family Members Employed	Pearson Correlation	.153	1
	Sig. (2-tailed)	.056	
	N	157	157

Source: Authors, 2016.

3.2.3 Number of Dependants in each Household

The study has found that the most frequent number of dependants per household in the public housing areas investigated is four (22.3%) as indicated in Table 10. The second highest number of dependants has been established by the study as five with 19.7% of the tenants. Another 22 households (14%) indicated two dependants, while there are two tenants (1.3%) who indicated 12 as the number of dependants in their family. Only one family indicated eleven as the number of dependants, while yet another family indicated fourteen as the number of dependants in the household (Table 10). From our experience, the numbers of dependants or family members who may be unemployed immediately after completing school also tend to accentuate the financial burden faced by some households.

Table 10. Number of Dependants

No. of Dependants	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
No. of Households	1	9	22	20	35	31	19	6	6	4	0	1	2	0	1	157
Percent	0.6	5.7	14	12.7	22.3	19.7	12.1	3.8	3.8	2.5	0	0.6	1.3	0	0.6	100

Source: Authors, 2016.

The numbers of unemployed family members may have a great adverse impact on the aggregate income of many tenants through worsening housing affordability problem. The higher the number of dependants, the more stress the income is subjected to, and thus the higher the housing affordability ratio. This is because the number of dependants a tenant has would tend to affect the tenant's income (salary) with regards to the size of the family under the customary lineage system. A Pearson's correlation test was also carried out to determine the relationship between income and number of dependants and level of statistical significance, as indicated in Table 11.

Table 11. Pearson's Correlation Test Results of Income and Number of Dependants

Correlations			
		Income	Dependants
Income	Pearson Correlation	1	.127
	Sig. (2-tailed)		.113
	N	157	157
Dependants	Pearson Correlation	.127	1
	Sig. (2-tailed)	.113	
	N	157	157

Source: Authors, 2016.

Findings indicate a weak, but positive relationship (two-tailed) between the two variables (0.127). However, the relationship is not statistically significant ($r = 0.127$, $p = 0.113$).

In summary, cultural lineage tends to affect the income of households in PNG through three factors, namely: the number of children or wards in schools, the number of family members employed, and the number of dependants in each household. These are lineage system-related factors that are impacting, either positively or negatively, households' public housing affordability potentials in the urban centres of PNG.

4. Discussion and Conclusion

This study was designed to explore the impacts of lineage culture on the affordability of public housing in PNG using Port Moresby and Lae as case studies. The study set out to answer three research questions. The first research question examined the meaning of lineage group and its significance on public housing affordability in PNG today. To answer this question, chi-square test was employed to establish the nature of the relationship between marital status (single, married and widowed) and public housing costs, which yielded a positive relationship that is statistically significant: $\chi^2 = 345.293$, DF = 3, P = 0.000 for marital status and $\chi^2 = 156.834$, DF = 23, P = 0.000 for housing costs. The "P" value in

both cases is less than 0.001; therefore, the relationship is statistically significant (Table 5). The second research question examined whether or not cultural lineage affects the income of households in PNG cities. To answer this question, three parameters of cultural lineage (Number of Children/Wards in Schools, Number of Family Members Employed and Number of Dependants per Household) were analysed and compared with tenants' income using Pearson's correlation test.

First, the Pearson's correlation test carried out to find the relationship between tenants' income and the number of children who attend schools and tertiary institutions in the country produced a weak but positive correlation that is statistically significant at 0.05 (Table 7) given that r = 0.166, p= 0.038. Second, analysis of the relationship between income and number of family members employed (Table 9) produced a positive, but very weak correlation (0.153) between the two variables (two-tailed), which is not statistically significant at 0.05 (r = 0.153, p = 0.056). Third, Pearson's correlation analysis of income and number of dependants also produced a weak, but positive relationship (two-tailed) between the two variables (0.127), which also is not statistically significant (r = 0.127, p = 0.113). Given the weak correlations and lack of statistical significance between tenants' income, number of family members employed and number of dependants per family, cultural lineage is a huge burden on public housing tenants as their take-home income is insufficient to meet their housing and other expenses.

This then leads us to our third research question: *How can we resolve the seeming intractable public housing affordability problem in PNG?* Having regard to the various findings above, it may be concluded that the problem of public housing affordability cannot be resolved easily with the existence of the lineage culture syndrome in the urban centres of PNG and other Melanesian Island nations in the Pacific Region. Public housing tenants will continue to face this problem unless there are policies established by the housing authorities and the local municipalities or the National Government to regulate the public housing units in the country for purposes of resolving the housing affordability dilemma. Therefore, to minimize the adverse impacts of lineage culture on public housing affordability in the country, the following recommendations are put forward for thoughtful implementation by all housing stakeholders in the country:

a) Public housing regulations must be introduced to minimise the number of legal occupants of public housing units in the towns and cities. This would mean strict regulation of the number of relatives that a legal tenant can accommodate in his/her housing unit. The pegging of the number of occupants in each public housing unit would enhance legal tenants' chances of achieving a desirable housing affordability status that has been a luxury for years in PNG. This can be achieved by reducing the number of relatives' children of school age that a tenant can accommodate in their home and the number of non-dependants that a tenant can accommodate in their home. The reduction of these factors would have a positive effect on the spendable income of the household, which will be less stressed and enough to meet housing and other expenses of the household, thereby raising public housing affordability levels in the country.

b) Housing authorities in the towns and cities will have to effectively enforce the maximum age for a

dependant. The dependency age must be below 18 years. Those children over the age of 18 who are no longer in schools or institutions are no longer dependants, thus should be disqualified from living under their parents' roofs. This is the standing practice in most western nations. To make this possible, children above 18 years should be subjected to the following:

i) They may be sent to the customary origins of their parents (matrilineal or patrilineal) depending on which system is used in the parents' customary settings, where the vast land mass in the country (86%) is customarily owned and is begging to be cultivated for agricultural production that is capable of lifting PNG into food sufficiency through mechanized farming. This would be a reversal of the lineage culture syndrome from the towns and cities and back to the rural areas where each lineage would enjoy abundant supply of customary land for economic development. In fact, this reversal policy, if properly implemented, can be a wake-up call to the stakeholders of the Small Agricultural Business Leases (SABLs) that have been approved across the country to facilitate economic development of customary lands and create jobs for jobless youth who now roam the streets in the cities; and

ii) If employed after reaching the age of 18, those children should be assisted to find a separate accommodation by the company or organisation that has employed them. This may be through the provision of housing allowances along with their salaries. Every employer (both private and public) should be encouraged by the government to make company housing or housing allowance a part of employment package for their employees in the country. This would help in minimising the challenges associated with workers facing public housing affordability issues in the towns and cities of PNG.

c) The ongoing codification of PNG customs by the Law Commission should be speeded up to streamline local customs across the country, demystify *wantokism* and facilitate sustainable customary land development. This is highly desirable in PNG in the wake of recent research findings confirming that the Incorporated Land Groups (ILGs), which control the use and development of customary land, are not sustainable (Karigawa, Babarinde, & Holis, 2016). Success in this direction would be enhanced by public empowerment drives, capacity building and economic emancipation of the general public that will ultimately reverse over-dependence of public servants on government-subsidized public housing units in towns and cities.

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