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Original Research

The New Social Housing Programs Will Respond to the Dwelling Demand in Bujumbura City? A Socio-demographic Analysis Based on Household Solvency

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Abstract

More than 30 years after the failures of the free housing and rent-to-own policies experienced from 1962 to 1989, the Burundi government has announced the resumption of the supply of housing under the rent-to-own system. The aim of the study is to contribute to the assessment of the capacity of the housing programs to respond to urban housing demand and the required efforts to satisfy this demand. It analyzes the proportion of solvent households by frequencies tabulation and determines the profile of non-solvent households by Multiple Correspondence Factorial Analysis. The analysis is performed from data on 580 households that did not own their dwellings at the time of the Integrated Survey on the Household Living Conditions in Burundi (EICVMB 2019). The results show that only 15.2% of households have a solvent housing demand to which the housing programs can offer decent houses. Non-solvent households are those whose heads are uneducated and without formal employment. These households are renting small dwellings (1 to 3 pieces), at a low cost (less than BIF 50,000 or slightly more). These results show that public housing programs are a necessary, but not sufficient solution to the issue of decent housing in Bujumbura. To ensure access to decent housing, there is need for more purchasing power through professionalization and employment. In addition, community group initiatives would enable self-construction of housing and basic social services.

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Résumé

Plus de 30 ans après les échecs des politiques de logement gratuit et de location-vente de 1962 à 1989, le gouvernement burundais a annoncé la reprise de l'offre de logements sous le régime de la location-vente. L'objectif de l'étude est de contribuer à l'évaluation de la capacité des programmes de logement à répondre à la demande de logement urbain et aux efforts nécessaires pour satisfaire cette dernière. Elle analyse la proportion de ménages solvables par la tabulation des fréquences et détermine le profil des ménages non solvables par l'Analyse Factorielle des Correspondances Multiples. L'analyse est faite à partir des données de 580 ménages qui n'étaient pas propriétaires de leur logement au moment de l'enquête Intégrée sur les Conditions de Vie des Ménages au Burundi (EICVMB 2019). Les résultats montrent que seuls 15,2% des ménages ont une demande de logement solvable à laquelle les programmes de logement peuvent offrir des maisons décentes. Les ménages non solvables sont ceux dont les chefs sont sans éducation et sans emploi formel. Ces ménages louent de petits logements (1 à 3 pièces), à un coût peu élevé (moins de 50.000 BIF ou un peu plus). Ces résultats montrent que les programmes de logements sociaux sont une solution nécessaire, mais non suffisante à la question du logement décent à Bujumbura. Pour assurer l'accès à un logement décent, il est nécessaire d'augmenter le pouvoir

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d'achat par la professionnalisation et l'emploi. De plus, les initiatives des groupes communautaires permettraient l'auto-construction des logements et des services sociaux de base.

1. Introduction

Africa's post-independence period has been characterized by policies to deal with precarious housing conditions and the set-up of social housing (Biehler et al., 2015; Fathallah, 2005). The demolition of slums was so violent that it can be compared with the operations carried out by Haussmann in France in the 1860s (Davis & Mailhos, 2006). Indeed, the independence discourses of newly independent nations were accompanied by ambitious anti-poverty programs, including the promotion of urban housing, which were executed for most countries during the 1960-70, 1970-80 and 1980-90 decades (Biehler et al., 2015; Fadiala Ba & Bertrand, 2012). Leaders thus motivated contracted loans from the Bretton woods institutions (Biehler et al., 2015; Davis & Mailhos, 2006). The institutions in charge of housing and urban planning were responsible for social housing programs, to mean for providing all urban dwellers with decent housing (Parenteau & Charbonneau, 2005).

However, these policies did not yield the expected results for a number of reasons. Firstly, African governments were unable to reimburse the loans they had contracted with the international financial institutions (Davis & Mailhos, 2006). As a result, they were forced to adopt Structural Adjustment Policies (SAPs), which forced them to reduce public investment in less lucrative sectors, including social housing (Biehler et al., 2015; Davis & Mailhos, 2006). While many states were reducing the supply of social housing, the rural exodus was bringing another demand, that of the poorest, to the cities (Antoine, 1991; Diallo et al., 2020). Today, the pressure of demographic growth, leading to an increasingly high demand for housing, far exceeds supply in most cities (Bennasr, 2003; Houndji, 2023; Oyalowo et al., 2018; Yaacob & Hassan, 2023).

In Burundi, social housing programs began during the Belgian colonial period, with the aim of providing decent housing for the local labor force. Between 1962 and 1972, free housing was allocated to State employees. Between 1972 and 1979, as the cost of maintaining and equipping theses houses became unaffordable, the government adopted the strategy of transferring the housing to its occupants while abolishing the allocation of housing in kind. Between 1979 and 1989, State employees were helped to buy their own homes by increasing the housing allowance from 25% to 60% of their monthly salary. Buildings from these different periods still characterize the landscape of the city of Bujumbura (Photo 1). After 1990, the government, facing the increasing demand from State employees during the Structural Adjustment Policy period, had to withdraw, introducing a policy of self-financing housing (Banderembako, 2011; Toyi et al., 2022).

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Photo 1. Social Housing in South of Mutanga (Mukaza). (Source: Yaga Magazine: https://www.yaga-burundi.com/2023/logements-sociaux-mutangite/, consulted on November 23, 2023)

In sum, these programs have not been able to respond to the initial problem of housing, as they could not avoid the poverty zones. Burundi, which had experienced a series of socio-political crisis in addition to its non-solvency with the international financial institutions, has not been able to provide housing for all applicants. Interventions were limited to the few officials, whose growing numbers, could not be satisfied (Toyi, et al., 2022). Meanwhile, another demand - that of the poors, resulting from the rural exodus - emerged, since it could not be satisfied by the services of the Supervision of Construction and Site Management (Encadrement des Constructions et Aménagement des Terrains - ECOSAT), let alone those of the Public Housing Company (Société Immobilière Publique - SIP). The ECOSAT programs came to the end on the eve of the 1993 crisis, leaving an unserved solvent demand and a non-solvent mass of urban housing applicants. Subsequently, the socio-political crisis added a significant proportion of housing demand from war-displaced people, with poor as the majority (Banderembako, 2011; Toyi et al., 2022).

Today, the international community strives for sustainable cities and communities (SDG 11) and the reduction of inequalities (SDG 10), thus access to decent housing for all (UN, 2015). In Burundi, the 2016-2030 SDG prioritization report envisages adequate and safe housing and basic services at an affordable cost for all, and sanitizing slum areas (Republic of Burundi, 2018). To implement the new vision of an emerging Burundi in 2040 and a developed in 2060, the Ministry in charge of infrastructure has announced the implementation of the social housing policy, which were scheduled to start from the summer of the year 2023 (Niyongabo, 2023). The offer will give priority to the rent-to-own system, open to all applicants, public and private agents or entrepreneurs, who provide proof of solvency. This policy was endorsed by the Council of Ministers on June 7, 2023, and the first social housing construction sites were to be launched as soon as possible (Communiqué de presse N°07 de la réunion du Conseil des Ministres du mercredi 07 Juin 2023, 2023 - Press release N°07 of the Council of Ministers meeting of Wednesday June 07, 2023).

Bujumbura, the national business capital, is home to more than 68% of the renters in the country (Appendix 1). Nearly 61% of its population lives in rent, while 10.2% are in free or

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employers' accommodations. Only 28.9% of Bujumbura's city dwellers are owners of their accommodations (Appendix 2). These statistics show the extent to which the issue of housing requires particular attention in the city of Bujumbura, because in the rest of the country, which is essentially rural, the majority of households are owners of their dwellers (Appendix 2). That is why in this context of social housing programs resumption in Burundi, this study aims to assess the capacity of these programs to respond to the demand of urban housing in Bujumbura city. The study investigates and identifies the required efforts to respond to these social needs. Specifically, this study seeks to estimate the proportion of households in the city of Bujumbura that are likely to be served by urban housing due to their solvency. In addition, it determines the profile of households whose demand for housing is not solvent.

The results of this study may therefore be of interest in terms of urban planning, housing programs and projects, and scientific research. In terms of planning, they serve as a reminder of the need to diversify the urban housing supply, targeting both solvent and low-income households. The same applies to urban housing programs and projects that would provide housing for solvent households, while facilitating the progressive empowerment and support of poor households towards the acquisition of their own homes. At the scientific level, this involves reviving the debate on the effectiveness of these interventions, which have shown their limitations in the past, and renewing this debate with statistical evidence.

This multi-level interest is pursued through the sections following section on the literature review, the methodology, the results, and their discussion below.

2. Literature review

Empirical studies of household solvency in relation to urban housing supply are sparse in the literature. However, some researches have been conducted with regard to the extent to which the population is able to access the urban housing. Some existing literatures have also identified the factors of unaffordability or non-access to urban housing.

With regard to the proportion of the population able to access to the urban housing, the 2011 African Development Bank's report revealed that only 3% of the African population can afford a mortgage (AfDB, 2011 cited by Kieti & K'Akumu, 2018). The same proportion (3%) was also indicated by the Centre for Affordable Housing Finance in Africa (CAHF, 2021). In another study, Kieti and K'Akumu (2018) found that only 11% of urban households can afford to pay a mortgage. Zulhisyam (2022) reported that 60% of government workers were unable to afford housing, based on the Congress of Unions of Employees in the Public and Civil Services Malaysia (CUEPACS) in 2019.

Regarding the factors preventing the population from accessing the housing, several studies mention the effect of demographic growth, which leads to high demand for urban services including housing, resulting in an imbalance between the high demands and the supply ability (Dhonte et al., 2001; Diallo et al., 2020; Houndji, 2023). For example, Dhonte and colleagues (2001) noted that, during the demographic transition in the Middle East, the change in population structure was reflected in the high growth rate of the working-age population and the growth of its proportion of the total population, resulting in a strong and accelerating demand for employment, as well as an unsatisfied demand for housing. Fattallah (2005), although not alone, adds that housing problems are exacerbated by the rural exodus in a

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context of under-equipment. Thus, the migrant household would be the most likely not to apply for urban housing.

Other factors are mentioned in studies related to mortgage housing subscription. The study that most closely addresses solvency is that conducted by Kieti and K'Akumu (2018) in Kenya. Others describe, without naming solvency, the factors that can be at the root of the problem of access to housing in urban communities. The main factors include the population's low purchasing power (Adedeji, 2023; Banderembako, 2011; Diallo et al., 2020), incriminating low household income (Adedeji et al., 2023; Anacker, 2019; Zulhisyam, 2022). Other scholars mention socio-demographic factors such as household size (Chapman, 2019; Kieti & K'Akumu, 2018), number of salaried persons in the household (Chapman, 2019; Kieti & K'Akumu, 2018; Teng et al., 2022), age and/or life cycle (Jocelyn et al., 2023; Zulhisyam, 2022). In their study of factors associated with access to housing in urban areas of the Democratic Republic of Congo, Jocelyn and colleagues (2023) identified other geographical (province of residence) and socio-demographic (socio-professional category, education and gender) characteristics.

Although they do not necessarily focus on solvency, these studies show the factors that can be taken into account to characterize households with regard to their solvency. In this sense, they serve as good references for this study, since it uses a socio-demographic analysis of household solvency to assess the ability of housing programs to meet urban housing demand in Bujumbura. This is an approach that is less applied in reviewed works, let alone in the Burundian context.

3. Materials and Methods

3.1. Data source

To achieve its objectives, this study uses data from the Integrated Survey on the Household Living Conditions in Burundi (Enquête Intégrée sur les Conditions de Vie des Ménages au Burundi - EICVMB 2019). The data for the city of Bujumbura and the variables available for this study are extracted from this survey, which was carried out at national level. The survey was based on a two-stage stratified random sample design, with Counting Zones (Zones de Dénombrement – ZD) constituting the primary units and households, the secondary ones. The city of Bujumbura constituted one stratum (ISTEEBU, 2021). Households within each Counting Zone were selected randomly. Thus, the collected data meet the requirements of this study that supposes the extrapolation of its results to the entire city of Bujumbura.

3.2. Target Population

This study assesses the ability of households to subscribe to the social housing supply in the context of their resumption in Burundi. The target population includes households living in rents in the city of Bujumbura at the time of the survey, and whose members agreed to answer the questionnaires. After applying the necessary filters, the process shows that this is a sample of 580 households living in rented accommodation in the city of Bujumbura, and the research covers a period of two years in 2019-2020.

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The sample of 580 households is large enough to allow the results to be extrapolated to the entire city of Bujumbura. The population of Bujumbura was estimated at 824,315 inhabitants in 2020 (ISTEEBU, 2017). Considering the average household size of 4.6 inhabitants (BCR, 2011), the parent population of households would be 179,199 households.

Considering a margin of error of 5%, applying the Slovin formula would give a sample of approximately 400 households.

$$n = \frac{N}{1+N*e^2} = \frac{179199}{1+179199*(0{,}05*0{,}05)} = 399{,}103 \approx \mathbf{400\ hoseholds}$$

Even though the study had no other option than to use the EICVMB data as a secondary source, this calculation shows that the sample of 580 households is sufficient for this study. The sample, covering all three municipalities that made up the city of Bujumbura at the time of the survey, is representative (Table 1; Figure 3). This representativeness is reinforced by the fact that the EICVMB used random sampling, which strengthens the generalizability of the results to the entire city of Bujumbura.

3.3. Variables involved in the study

The analysis is based on seven variables chosen for their relevance to the study of housing problems and for their availability in the EICVMB survey databases. The main variable relates to household solvency. A solvent household is one whose income allows the members to spend a certain amount on housing, or to meet certain additional conditions in order to obtain housing (Sobotschinski, 1963). This variable was generated from the socio-professional category of the head of household. It has two values (1) "solvent", if the head of household has a paid, skilled job (boss, senior manager, engineer and similar, middle manager/supervisor, skilled worker or employee) and (2) "non-solvent", if the head of household has an unskilled job or no paid job (unskilled worker or employee, manual labour, household helper, family worker contributing to a family business, own-account worker).

Other secondary variables are the type of employment of the head of household (formal, informal), the amount of monthly rent (less than 50,000 FBU, between 50,000 and 99,000 FBU, between 100,000 and 219,000 FBU, between 220,000 and 399,000 FBU, 400,000 FBU and over), the number of pieces in the house at the time of the survey (1 to 3 rooms, 4 rooms and more), level of education of the head of household (no education, fundamental cycle, post-fundamental cycle and university), household size (≤5 household members and 6 and more) and commune of residence (Muha, Mukaza, Ntahangwa) (Table 1).

3.4. Data quality

The data used were of high quality. None of the seven variables mobilized had a non-response rate reaching the 10%, a level that can be tolerated in the social sciences (Sindayihebura et al., 2022).

3.5. Analysis methods

Two analytical approaches were used. First, a univariate analysis consisting in a tabulation of frequencies to assess data quality and determine the proportion of solvent/non-solvent households. Secondly, a descriptive multivariate analysis using Multiple Correspondence

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Factorial Analysis (MCFA). Given that the variable to be explained was dummy and qualitative, the study should have used logistic regression or a logit model to study the factors explaining the household's non-solvency. However, the data did not seem to be suitable for this level of analysis. The limited availability of explicative variables does not allow sufficient control of the level of education of the head of household influence, which is the only factor associated with this phenomenon (Appendix 3). For this reason, the MCFA was preferred, as it allows the characterization of non-solvent households.

MCFA is an analysis method that consists in reducing to factors the cloud of points made up of the points-values of the variables mobilized for the analysis. Factors are constructed on the basis of Euclidean distances between values. The number of factors is determined by the difference between the total number of values analyzed (m) and the total number of variables mobilized (n) (m-n). By hierarchy, the first two factors that absorb the greatest proportion of total inertia are kept (Baudewyns, 2013; Meyer et al., 2004). The kept values are those whose contribution is greater than or equal to the average theoretical contribution to total inertia (CTR=100/m; m is the number of values) and whose weight (cosine squared) is greater than 1/(m-n) (n is the number of variables mobilized). With the kept values, profile determination is based on the Euclidean distance between values (Costa, 2013).

3.6. Analytical tools

Processing of the analysis file (reduction, merging of databases, filtering of households with housing or free housing, creation and recoding of variables), as well as frequency tabulation, were carried out using SPSS 25 software. Microsoft Excel (MS 16) was used for table and graph formatting. SPAD 5.5 was used to determine the profile of non-solvent households using the MCFA method.

3.7. Ethical considerations

The Enquête Intégrée sur les Conditions de Vie des Ménages (EICVMB) received the approval of the Comité Nationale d'Ethique, which examined its protocol and questionnaires. Having received the databases from the institute that carried out the study, this research has the guarantee that publication of its results does not contravene the ethical rules of research.

4. Results

4.1. Proportion of non-solvent households

Following the classification of households living in rented accommodation into two categories of "solvent demand" and "non-solvent demand" according to the socio-professional activities of the heads of households, the results show that only 15.2% of households in rent are solvent. In other words, there are 84.8% of households in need of urban housing in Bujumbura which are non-solvent, and for which the housing program cannot guarantee decent housing (Figure 1).

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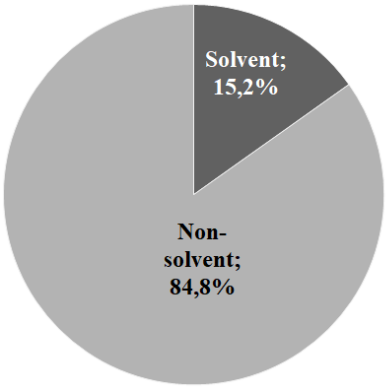

Figure 1. *Proportions of households by solvency status. Elaborated by Authors*

4.2. Profile of households with non-solvent housing demand

In the case of this study with 7 variables and 20 values, 13 factorial axes are generated, the two first of which are kept for their absorption of the largest part of the inertia (18.65% and 13.03% respectively). The values kept for the characterization of these factorial axes are those whose contribution is equal to 5, to mean 100/20. As an exception, three values will be retained for the practical interpretation of the results. These are the "SOLVENT" value (CTR=4.59) of the main variable (solvency status), "1 to 3 pieces" (CTR=2.89) of the variable relating to the number of pieces in the dwelling, "Less than 50,000" (CTR=2.97) of the variable relating to the monthly amount of rent, Mukaza (CTR=2.12) and Ntahangwa (CTR=0.07), relating to the commune of residence (Table 1).

Table 1: Variables, values and contribution to factorial axes. Elaborated by Authors

Variables and values		Frequencies	Contributions (CTR)		Coordinates	
Value labels	Labels in graph		Axe 1	Axe 2	Axe 1	Axe 2
Solvency status						
Solvent	SOLVENT	88	**25.66**	4.25	2.02	-0.69
Non-solvent	NON-SOLVENT	492	**4.59**	0.76	-0.36	0.12
Total		580				
Monthly rent						
Less than 50,000	Less50thsd	222	**2.97**	2.01	-0.43	-0.30
Between 50 et 99,000		179	0.00	3.32	0.01	-0.43
Between 100 et 149,000		59	0.14	0.12	0.19	-0.14
Between 150 et 199,000		59	0.92	0.79	0.47	0.36
200,000 and over	200thsd&over	61	3.53	**27.90**	0.90	2.12
Total		580				
Number of pieces in the rent accommodation						
1 to 3 pieces	1to3pcs	533	0.36	**2.89**	-0.10	-0.23
4 pieces or more	4pcs+	47	4.06	**32.77**	1.10	2.62
Total		580				
Level of education of the head of household						
No education	NoEduc	254	**5.89**	0.71	-0.58	0.17
Fundamental cycle		247	0.01	0.02	-0.02	-0.03
Post-fundamental cycle and university	PostF/Sup	79	**21.26**	2.01	1.97	-0.51
Total		580				
Type of employment of the head of household						
Formal job	Formal-J	154	**19.39**	3.54	1.33	-0.48
Informal job	Informal-J	426	**7.01**	1.28	-0.48	0.17

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Variables and values		Frequencies	Contributions (CTR)		Coordinates	
Value labels	Labels in graph		Axe 1	Axe 2	Axe 1	Axe 2
Total		580				
Household size						
≤ to 5 members		496	0.54	1.35	-0.12	-0.16
≥ to 6 members	Size6orOver	84	3.21	**7.96**	0.73	0.96
Total		580				
Commune of residence						
Muha	Muha	93	0.18	**6.01**	0.16	0.80
Mukaza		170	0.05	**2.12**	0.06	-0.35
Ntahangwa		317	0.15	**0.07**	-0.08	-0.05
Total		580				
Formal job	Formal-J	**19.39**	: value kept			

The projection of the values retained in the factorial plan shows that non-solvent households are mainly those with a monthly rent of less than BIF 50,000, living in 1 to 3 pieces dwellings. The heads of these households are uneducated and work in the informal sector (Figure 2).

Moreover, the same projection shows that households eligible for social housing programs are those paying a rent of BIF 200,000 or more, living in dwellings with 4 or more rooms and 6 or more members. Their heads have a post-fundamental education or higher, and work in formal employment (Figure 2).

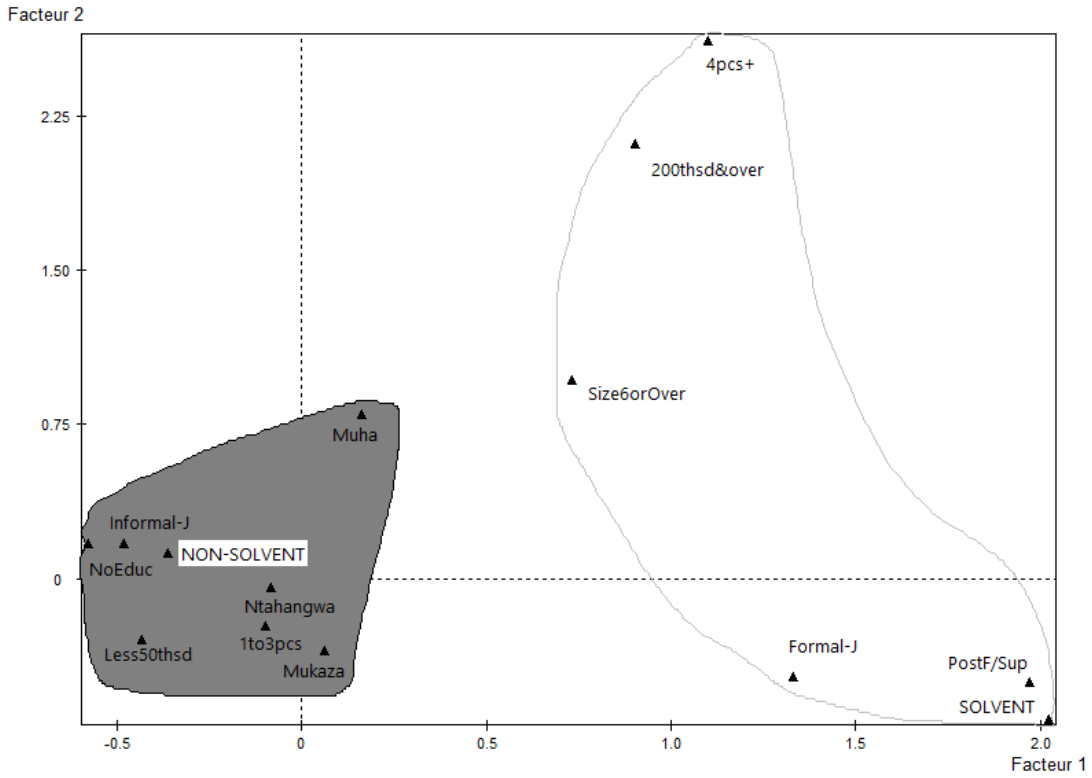

Figure 2. Profile of households by solvency status. Elaborated by Authors

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5. Discussion

Aiming to determine the proportion of solvent households to urban housing supply and the profile of non-solvent households, the discussion is made in two stages according to these objectives.

5.1. Proportion of solvent households

The results of this study show that only 15.2% of households surveyed can solvently subscribe to the social housing offer in the city of Bujumbura. These results are not surprising in the context of sub-Saharan Africa. In fact, the Centre for Affordable Housing Finance in Africa (CAHF, 2021), has shown that the housing issue in Africa remains a major concern. These findings, available in their yearbook, mention that there were 12 countries where a half of the urban population could afford even the cheapest mortgage housing. In other countries, the proportion of the population able to afford urban housing was estimated at less than 3%. This was the case in Mozambique, where the rate was 2.8%.

These data from the Centre for Affordable Housing Finance in Africa (CAHF) are similar to the findings of Kieti and K'Akumu (2018), who found that the proportion of households earning enough to take out a mortgage housing loan did not exceed 11% of urban households in Kenya. Although this is a framework outside the context of sub-Saharan Africa, we can mention the study by Zulhisyam (2022) whose results show that 60% of government workers were unable to benefit from public housing provision based on the Congress of the Malaysian Union of Civil and Public Service Employees (CUEPACS) in Penang (Malaysia). Data from developed countries, on the other hand, show that they have been able to enable the majority to benefit from social housing policies, even if the quality remains detrimental (Jacquemard, 2021).

These findings of studies on the proportion of households that can solvently subscribe to the housing give substance the reason of being to this study, which aims to assess the effectiveness of social housing policies to respond to the aspirations of urban dwellers. At this juncture, it is important to examine the profile of households for whom interventions need to be planned. Interventions to improve supply would take account of the characteristics of this profile.

5.2. Profile of non-solvent households

The results of our analysis of the profile of households not solvent to social housing supply show that this is determined by socio-economic characteristics (monthly rent, number of pieces in the rented dwelling) and socio-professional characteristics (level of education, type of employment). The commune of residence is also taken into account. The following lines discuss the influence of these characteristics.

5.3. Influence of socio-economic determinants

As already indicated, households unable to meet the housing demand are those renting the modest houses (1 to 3 pieces), with the lowest rental costs (less than BIF 50,000). These results are similar with those of Banderembako (2011) who, studying the challenges of access to housing in Burundi and possible responses, found that the factors of non-access to

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housing are low purchasing power in the context of a progressive increase in the cost of construction. In the same line of thought, Diallo et colleagues (2020) found that low-income households find it hard to access to land in the city of Bamako because they have no guarantee of solvency on the part of banking institutions. Teng et colleagues (2022), studying factors affecting housing affordability in the peninsular state of Selangor (Malaysia), found that monthly income and property prices had a significant influence. Zulhisyam (2022) adds the type of house, house design, location and neighborhood of the house to which the city dweller aspires.

All these factors show that poor households, who rent homes in outlying and less comfortable neighborhoods, have low incomes to subscribe to the social housing supply with solvency insurance. This is why the study carried out in Bamako (Diallo et al., 2020) mentions this low income as one of the factors behind the city's uncontrolled expansion to the benefit of the proliferation of precarious housing on the peripheries. For Biehler et al (2015), social housing policies have almost always benefited the wealthiest categories. Poor households are forced to squat in slums where the informal dominates the formal (Davis & Mailhos, 2006).

Thus, it would be reasonable to say that the 85% of non-solvent households in the city of Bujumbura will still be obliged to occupy spontaneous and precarious housing zones, defying the aim of the resumed social housing policy. The duality of a modern city juxtaposed with slums and pockets of poverty will persist despite the efforts made.

5.4. Influence of socio-professional determinants

The results of this study show that the profile of households not solvent for social housing is also determined by the absence of any level of education for the heads of household and their employment in the informal sector.

These results converge with the study by Jocelyn and colleagues (2023) who found that bosses were more likely to have access to housing than those employed in other activity categories in the urban areas of the Democratic Republic of Congo. The same study reveals that those employed in the tertiary sector were more likely to access housing more than those in the primary and secondary sectors in 2005 and 2012, although this relationship lost significance in 2016 (Jocelyn et al., 2023). Studies by Kieti and K'Akumu (2018), Chapman (2019) and Teng and colleagues (2022) reinforce the role of employment in access to urban housing: as the number of employees in the home increases, so does the possibility of accessing housing.

As for education, the study by Jocelyn et al. (2023) showed that the higher is the level of education of the head of household, the higher is the probability of access to urban housing. Although the study by Zulhisyam (2022) found no significant influence of education, it cannot be ruled out as a factor influencing access to urban housing, due to its influence on the type of employment.

Davis and Mailhos (2006) reported that housing problems in the tropics have been amplified by the rural exodus, which has brought to the cities a workforce that the city was not ready to accommodate. These new immigrants, unqualified for formal employment, will be forced to work in the informal sector, whose low-paid jobs are not likely to enable the urban

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poor to subscribe to a social housing supply. As observed by Assué and Gnepehi (2023) in their study of the informal sector as an alternative to youth under-employment in the Toumodi sub-prefecture (Abidjan, Ivory Cost), income from the informal sector is only used to pay rent and buy food - in other words, it's not enough to afford housing in the town.

Looking at it closely, all these findings highlight the fact that belonging to a social category with uncertain incomes makes a household less likely or not at all likely, to be solvent to a housing offer. Thus, in the context of Bujumbura, where the majority of households are struggling to become solvent, because they have neither stable employment nor a secure income, the supply of housing, no matter how much better it might be, would not enable all urban dwellers to access decent housing in line with national and international development objectives.

5.5. Influence of commune of residence

The study of the profile of households not solvent to the urban housing supply has shown that the commune of residence also participates in the definition of the said profile.

This study is not the first to show that locality of residence influences housing affordability. Jocelyn and colleagues (2023) showed that households in Kinshasa were the most likely to access housing than those in other provinces in the DRC in 2005, 2012 and 2016. Furthermore, they explain that, in addition to Kinshasa, the Katanga province benefits from its advantage as an economic capital, while Nord-Kivu, Maniema and Bas-Congo benefit from having been the origins of statesmen or colonial capitals.

These conclusions by Jocelyn and colleagues (2023) show that the eccentricity of the locality of residence may be at the origin of the hard access to housing. Fathallah (2005), for his part, found that the peripheries, in an economically unfavorable context, become the focus of speculation in housing plots, where the poor are forced to accept squatter settlements, unable to subscribe to social housing or buy a house there.

In the case of the city of Bujumbura, the Muha commune cannot be described as the most "peripheral" for being, on its own, the focus of speculation and the stronghold in which the poorest rent squatter settlements dwellings with no hope of subscribing to the social housing supply. Indeed, in all three of the city's communes, the proportion of non-solvent households is the highest (84.9% in Muha, 83.5% in Mukaza and 85.5% in Ntahangwa) (Figure 3). Moreover, even if the communes of Mukaza and Ntahangwa are not retained to characterize the factorial axes due to their low contributions, their projection in the factorial plane would place them alongside the values that participate in defining the profile of non-solvent households (Figure 2).

Without compromising the reputation of the residential and classy neighborhoods dominated by single-family dwellings in Gihosha quarter (in Ntahangwa), Kiriri and Rohero quarters (in Mukaza) for examples, this fact of predominating of non-solvent households shows that non-solvent demand for urban housing can be found everywhere in all the three communes. Even in Muha, there are upscale neighborhoods (Kinindo, Gasekebuye, etc.), but this does not prevent it from participating to define the profile of non-solvent housing households (Figure 4).

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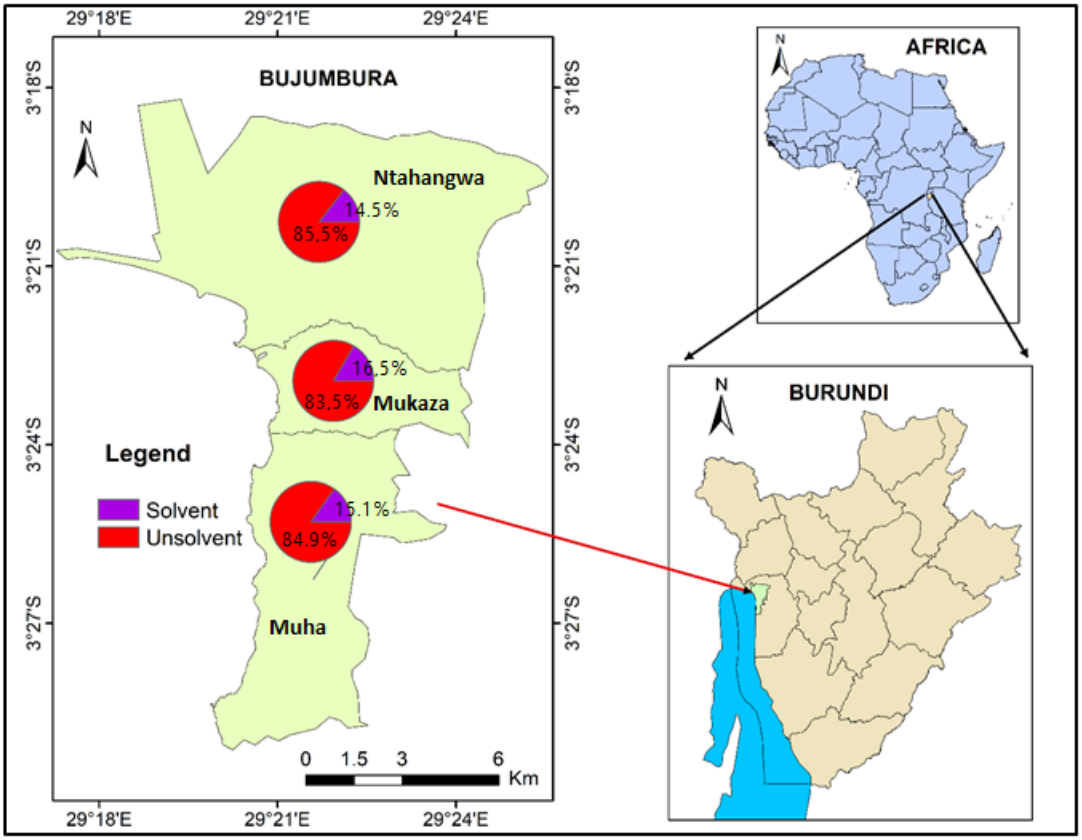

Figure 3. Proportions of households by solvency status, by commune of residence. Elaborated by Authors

To sum up, the fact that households are unable to access social housing is due to the fact that the majority of households, whose head are uneducated without stable employment, are not included in the stable income categories. What these households earn is not enough to cover their primary needs, so that they have sufficient savings to think of their own housing. This is not, therefore, inequality attributable to spatial exclusion according to locality of residence, but rather to households' lack of solvency with regard to housing supply.

Given the above, instead of seeking to produce turnkey housing that cannot respond to the entire demand of the urban population - the non-solvent being the most numerous - real estate development initiatives should involve city dwellers in the production of supply. Experience has shown that by creating associations, local authorities can facilitate access to land, self-building and basic infrastructure (Akinwande & Hui, 2024; Salgado, 2001), and improve market elasticity and affordability (Oyalowo et al., 2018). Obviously, this grouping into community associations should not exclude employment prospects, which should provide access to income.

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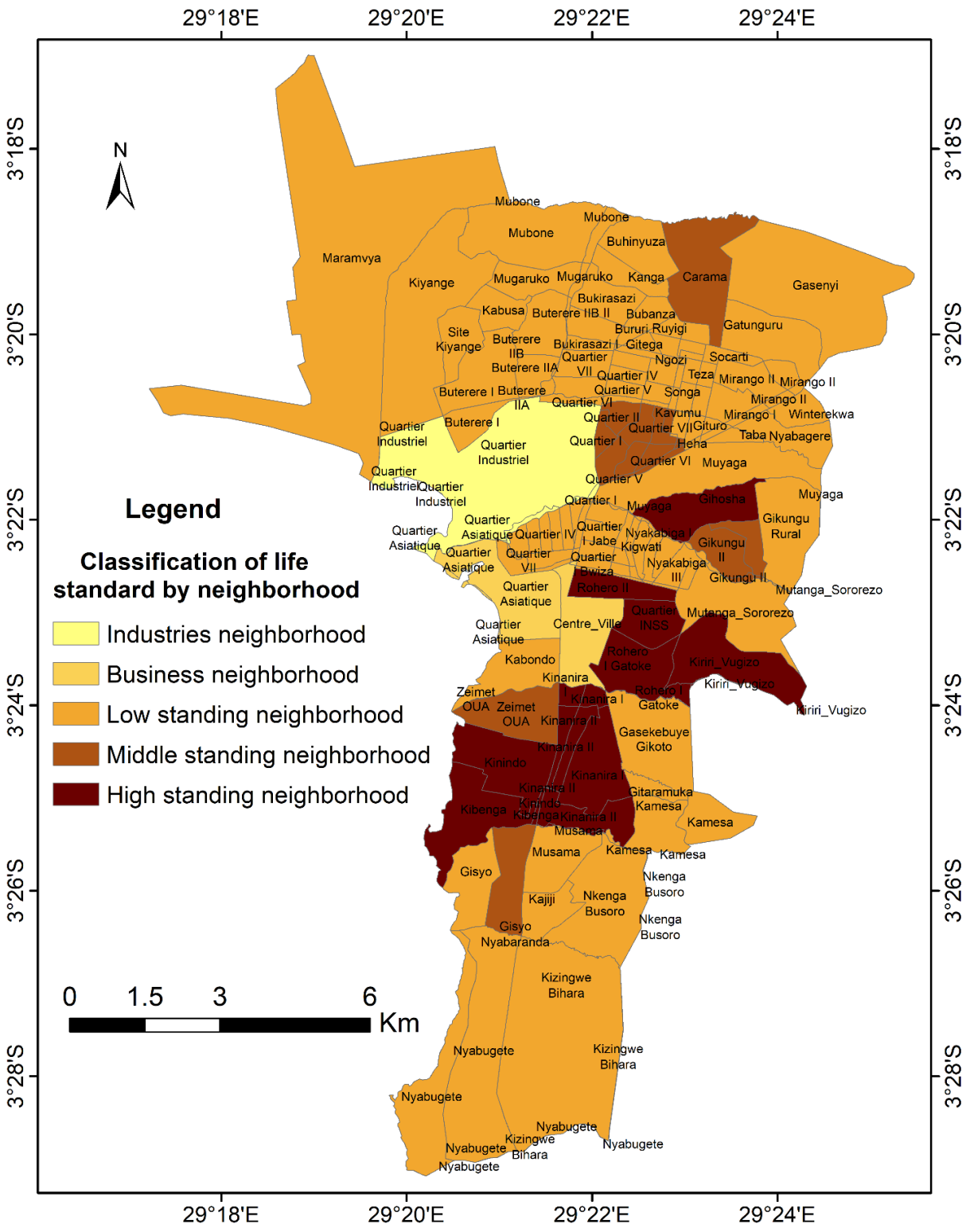

Figure 4. *Classification of neighborhoods by standards of life in Bujumbura town. Elaborated by Authors*

5.6. Strengths and weaknesses

This study has the merit of attempting to shed light on housing policy interventions using a quantitative approach, as previous studies have been exclusively theoretical in the Burundian

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context. It also represents a contribution to the construction of a conceptual framework for socio-demographic and empirical studies of the housing issue, most of the previous studies having been carried out with an economist orientation, mobilizing mainly economic variables.

The study's limitations include the absence of demographic variables such as the age and sex of the head of household, whose influence on vulnerability to housing problems has been demonstrated. This shortcoming could be remedied by organizing a specific study.

6. Conclusion

In a context of announced resumption of social housing programs, this study endeavored to determine the proportion of households that could subscribe to the social housing offer given their solvency. In addition, this work examines the profile of non-solvent households to inform decision-making on interventions to serve the greatest proportion of households. Data from the Integrated Survey on the Household Living Conditions in Burundi (EICVMB) were analyzed by frequency tabulation and MCFA. The results show that the social housing programs as announced could only satisfy 15% of the needy. These non-solvent households have incomes that only allow them to rent narrow dwellings (1 to 3 pieces). Their uneducated heads only work in the informal sector, with no stable income, and therefore earn what would not allow them to solvently subscribe to the social housing supply. These results show that public housing programs are a necessary, but not sufficient solution to the problem of access to decent housing in Bujumbura. To increase the solvency and self-financing inherent in access to decent housing, future interventions would promote employment and professionalization, and thus increase purchasing power. Action in community groups/associations would enable access to housing at the same time as basic social infrastructures.

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Use of generative AI

The authors declare that they have not used any form of artificial intelligence tools to produce the results of this research.

Source of funding

None funding to declare.

Conflicts of interest

The authors declare no interest conflict.

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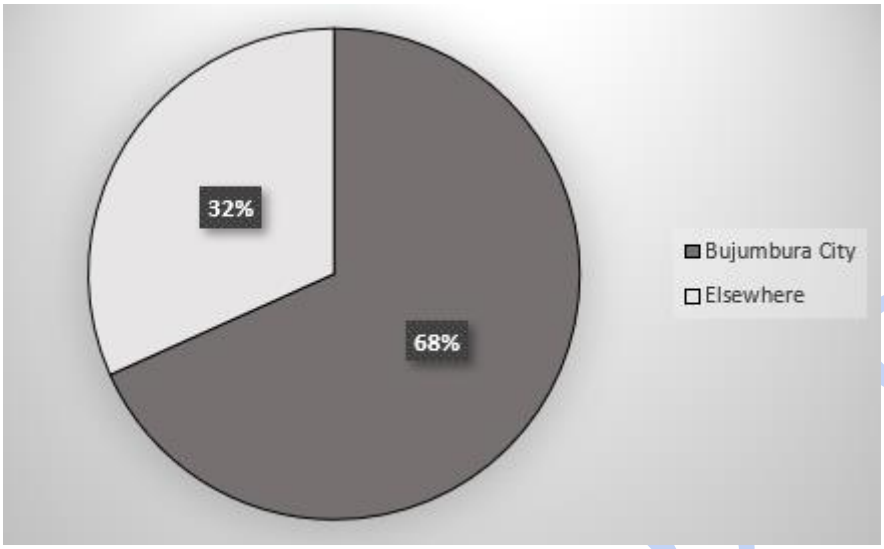
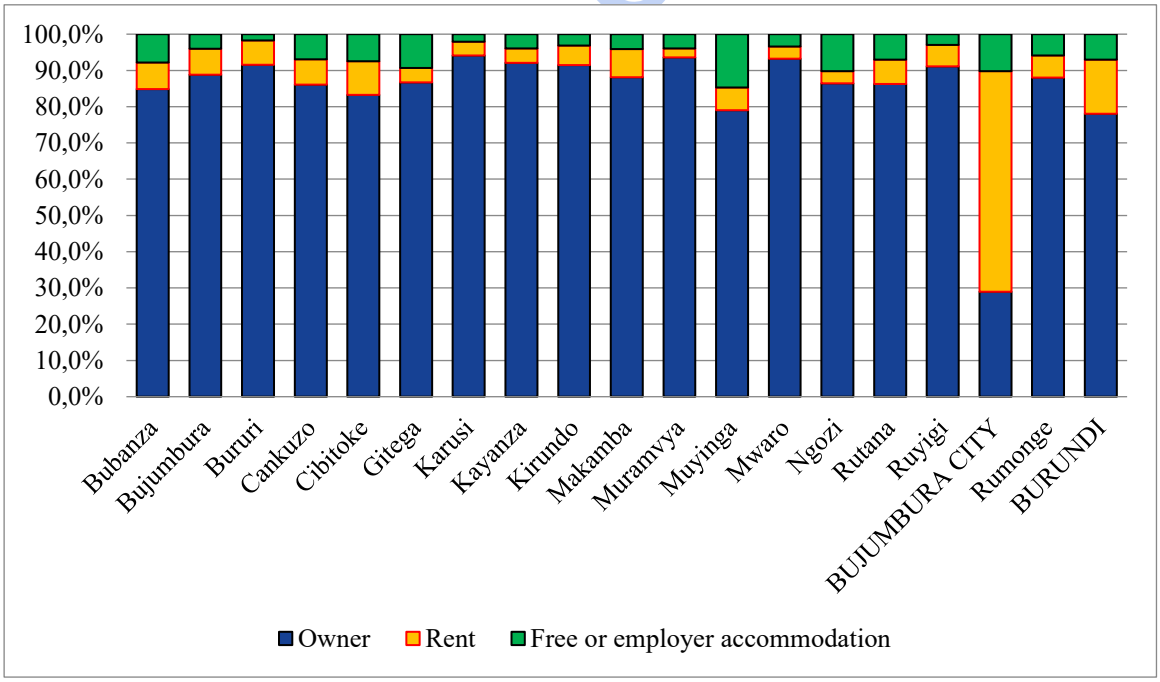
Appendixes

Appendix 1. Proportion of households in rent by residence



Source: Authors, analysis of the EICVMB Data

Appendix 2. Proportion of households by dwelling occupation status: 61% in Bujumbura City are in rent



Source: Authors, analysis of the EICVMB Data

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Appendix 3. Results of logistic regression

Random section		
Likelihood (LR Chi2)	214,49	; p<0,05
Area under ROC curve	0,8548	

Fixed section				
Monthly rent	**N**	**aOR**	**p-value**	**95% CI**
Less than 50,000	222	0,773	p>0,05	0,342-1,746
Between 50 et 99,000	179	1		
Between 100 et 149,000	59	1,132	p>0,05	0,361-3,549
Between 150 et 199,000	59	0,694	p>0,05	0,229-2,109
200,000 and over	61	0,634	p>0,05	0,186-2,164
Total	580			
Number of pieces in the rent accommodation				
1 to 3 pieces	533	1		
4 pieces or more	47	2,287	p>0,05	0,607-8,618
Total	580			
Level of education of the head of household				
No education	246	1		
Fundamental cycle	239	0,102	p<0,05	0,033-0,345
Post-fundamental cycle and university	77	0,003	p<0,05	0,001-0,012
Total	562			
Household size				
≤ to 5 members	496	1		
≥ to 6 members	84	0,496	p>0,05	0,213-1,157
Total	580			
Commune of residence				
Muha	93	1,296	p>0,05	0,509-3,303
Mukaza	170	1,535	p>0,05	0,731-3,223
Ntahangwa	317	1		
Total	580			

The “Type of employment of the head of household” was excluded from the analysis because it predicts perfectly the non-solvency of the household (dependent variable)

Source: Authors, analysis of the EICVMB Data

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