

Alcohol and Rural Underdevelopment in the Mountainous Region of Kivu

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Abstract

This study investigates the extent and consequences of strong alcoholic beverage consumption in the Bushi region of the Democratic Republic of Congo (DRC). The research employed quantitative methods to link factors and qualitative methods to understand the perceptions and experiences related to alcohol use. Findings reveal that strong alcoholic beverages are the most prevalent type consumed, with a high percentage of young adults (18 - 35 years) engaging in heavy drinking, often starting at a young age (84% between 15 - 20 years). This excessive consumption is linked to numerous negative consequences, including family breakdown, economic hardship (unemployment, poverty), health problems (alcoholism, premature mortality), and social issues (violence, conflict). The study highlights the significant impact of alcohol abuse on various aspects of community life, including household stability, economic productivity, and overall well-being. Furthermore, the research explores the influence of factors such as land tenure, income levels, religion, gender, marital status, and education on alcohol consumption patterns. The study concludes by examining the perspectives of decision-makers and community members on the issue, along with proposed interventions to mitigate the harmful effects of alcohol abuse and promote sustainable socio-economic development in the region. The results underscore the urgent need for comprehensive strategies to address alcohol-related problems in the Bushi community.

Keywords

Alcoholism, Factors, Consequences, Rural, DRC

1. Introduction

Alcohol consumption is a pervasive global issue with far-reaching consequences

that extend beyond individual health to significantly impact family and community prosperity and development. While moderate alcohol use may be culturally accepted in some settings, excessive or harmful alcohol use poses a substantial threat to social well-being, economic stability, and overall societal progress.

The Individual Level is a foundation for Broader Impacts. The detrimental effects of alcohol abuse on individuals are well-documented. Excessive alcohol consumption is linked to a range of health problems, including liver disease, cardiovascular issues, and various cancers (Manson, 2020). Furthermore, alcohol abuse is strongly associated with mental health issues such as depression and anxiety (Gawn et al., 2024), increasing the risk of suicide attempts, particularly among women (Gupta et al., 2015). These health consequences not only impact the individual's quality of life but also place a significant burden on healthcare systems and families. The economic productivity of individuals is also negatively affected by alcohol abuse, leading to job loss, reduced income, and increased healthcare costs (Gyawali et al., 2024).

The family level impacts illustrate the erosion of social fabric. The negative consequences of alcohol abuse extend beyond the individual to significantly impact family dynamics and well-being. Alcohol problem discrepancies between partners are associated with lower dyadic adjustment, negatively affecting relationship functioning and increasing the likelihood of intimate partner violence (Flanagan et al., 2023). In families where one or both parents struggle with alcohol abuse, children are at increased risk of experiencing neglect, abuse, and emotional distress (Arias & Ferriani, 2010; Rafiee et al., 2019). This can lead to long-term developmental problems, educational setbacks, and increased risk of substance abuse in subsequent generations (Motlani et al., 2024; Power et al., 2005). The financial strain caused by alcohol abuse can further destabilize families, leading to poverty, food insecurity, and housing instability (Maina et al., 2024).

At the community level, alcohol is a societal burden. The cumulative effects of alcohol abuse at the individual and family levels translate into significant challenges for communities. High rates of alcohol-induced deaths, particularly among specific demographic groups like American Indian and Alaska Native populations, represent a major public health crisis (Manson, 2020). Alcohol consumption is also a significant contributing factor to various social problems, including crime, accidents, and domestic violence (Kibicho & Campbell, 2019). The economic burden on communities is substantial, encompassing healthcare costs, lost productivity, and the need for social services to address the consequences of alcohol abuse (Roberts et al., 2014). Furthermore, alcohol abuse can hinder community development by undermining social cohesion, reducing civic engagement, and creating an environment of fear and instability (Dhital et al., 2023).

Rural communities like those in Walungu and Kabare, DRC, often face unique challenges that exacerbate the negative consequences of alcohol abuse. These include limited access to healthcare. Rural areas frequently experience shortages of healthcare professionals and resources, making it difficult for individuals strug-

gling with alcohol dependence to access treatment and support services (Ross et al., 2015). This lack of access can lead to delayed diagnosis, untreated health complications, and increased mortality rates. Many rural economies are characterized by limited job opportunities and lower incomes, making residents more vulnerable to the financial strain caused by alcohol abuse (Jolex & Kaluwa, 2022). Alcohol-related job loss, healthcare costs, and reduced productivity can further destabilize already fragile economic situations. Rural communities often experience higher levels of social isolation, which can contribute to alcohol abuse and hinder recovery efforts (Allan et al., 2012). The lack of social support networks and access to alternative recreational activities can make it more difficult for individuals to cope with stress and avoid harmful alcohol use. Furthermore, in some rural communities, alcohol consumption is deeply ingrained in social customs and traditions, potentially normalizing excessive drinking and making it more difficult to challenge harmful behaviors (Allan et al., 2012; Alves et al., 2022). These cultural factors can create a permissive environment that fosters alcohol abuse and limits the effectiveness of prevention and intervention programs. The availability of alcohol, particularly through unlicensed or unregulated sources, can be a significant factor in rural areas (Takahashi et al., 2017). Easy access to inexpensive and potent alcohol can increase the risk of excessive consumption and related harms. At the family level, alcohol abuse can lead to relationship problems, domestic violence, child neglect, and financial instability (Takahashi et al., 2017). Children growing up in households affected by alcohol abuse are at increased risk of experiencing developmental problems, educational setbacks, and future substance abuse. At the community level, the cumulative effects of alcohol abuse contribute to a range of social problems, including crime, accidents, and reduced economic productivity (Jolex & Kaluwa, 2022; Shortt et al., 2018; Takahashi et al., 2017). High rates of alcohol-related deaths and hospitalizations place a significant burden on public health resources and hinder community development.

Several examples of communities where prosperity was hampered by alcohol abuse can be inferred. Authors consistently point to the disproportionate impact of alcohol abuse on rural communities (Blazer et al., 1987; Wekori & Miroro, 2021). The unique challenges faced by these areas, such as limited access to healthcare, economic hardship, and social isolation, exacerbate the negative consequences of alcohol abuse. The studies suggest that alcohol abuse in rural settings leads to decreased economic productivity, strained family relationships, and increased social problems, hindering overall community development. A specific example is mentioned in research focusing on Baringo Central Sub-County, Kenya, where alcohol abuse among youth negatively affected their involvement in productive economic activities such as farming and entrepreneurship (Wekori & Miroro, 2021). Similarly, research on Kiambu County, Kenya, highlights the negative impact of PTSD-associated alcohol abuse on the socioeconomic status of youth. Indigenous communities in North America were frequently mentioned in this regard. The devastating effects of alcohol abuse within Indigenous popula-

tions have been highlighted, particularly in the context of historical trauma and limited resources (Black et al., 2019; Libby et al., 2004; McKinley et al., 2023; Nadew, 2012; Valsala & Devanathan, 2021). Studies focusing on American Indian and Alaska Native populations show high rates of alcohol-related deaths and health problems, placing a significant burden on families and communities (Mohatt et al., 2014). Alcohol abuse in these communities is often intertwined with other social issues, such as violence, poverty, and mental health problems, creating a cycle of hardship that hinders prosperity and development. A study on a tribal community in South India illustrates the complex interplay between alcohol use, resilience, and social determinants of health within an Indigenous context (Valsala & Devanathan, 2021).

Several studies suggest that marginalized communities within urban areas are also significantly affected by alcohol abuse (Lacey et al., 2015; Olfson et al., 2003; Sinha et al., 2003). Studies focusing on the intersection of alcohol abuse, mental health, and social determinants of health indicate that these factors contribute to economic instability, family breakdown, and increased crime rates, hindering the prosperity of these communities. A study on US Black women highlights the association between severe intimate partner violence, discrimination, and alcohol abuse, impacting their mental health and overall well-being (Lacey et al., 2015). Research on young adult probationers referred to substance abuse treatment also points to the challenges faced by this vulnerable population (Sinha et al., 2003). Adolescents living in border communities, such as the US-Mexico border, experience high rates of alcohol risk behaviors (McKinnon et al., 2004).

Consistent findings across diverse geographic locations and populations strongly suggest that alcohol abuse is a significant barrier to prosperity and development in many communities worldwide. This paper will explore the multifaceted ways in which alcohol consumption undermines family and community well-being, examining its effects across various dimensions. While existing research highlights the detrimental effects of alcohol consumption on various levels, further investigation is needed to fully understand the complex interplay of factors contributing to alcohol abuse and its impact on family and community prosperity. This paper aims to address these gaps by analyzing the differential impacts of alcohol consumption across various demographic groups in an African context. This study will contribute to a more comprehensive understanding of the complex relationship between alcohol consumption and societal well-being, informing the development of effective strategies to mitigate its negative impacts and promote healthier, more prosperous families and communities. More specifically, this study will contribute to a more nuanced understanding of the complex relationship between alcohol consumption and rural community well-being in Africa, informing the development of effective strategies to mitigate its negative impacts and foster healthier, more prosperous rural communities.

We postulate that the aggravating factors of alcohol consumption and alcoholism are linked to poverty parameters, e.g., income, housing quality, land area, and

other welfare indicators. The specific objectives are: 1) to analyze the aggravating factors of alcohol consumption and alcoholism, and 2) to assess the social, economic, and cultural impact of strong drink consumption and alcoholism.

2. Methodology

2.1. Study Environment

The surveys took place in the Ngweshe and Kabare chiefdoms (**Figure 1**), two chiefdoms belonging to the same Bashi cultural group. They share common features, notably a high population density and a largely agricultural economy. Lake Kivu gives Kabare a more diversified economy, thanks to fishing and the cultivation of coffee and tea, which are important cash resources. Ngweshe, on the other hand, remains largely focused on subsistence farming. The Kabare chiefdom has a population of over 500,000, with a density varying between 430 and 570 inhabitants per km². The Ngweshe chiefdom is home to a dense population estimated at 600,000.

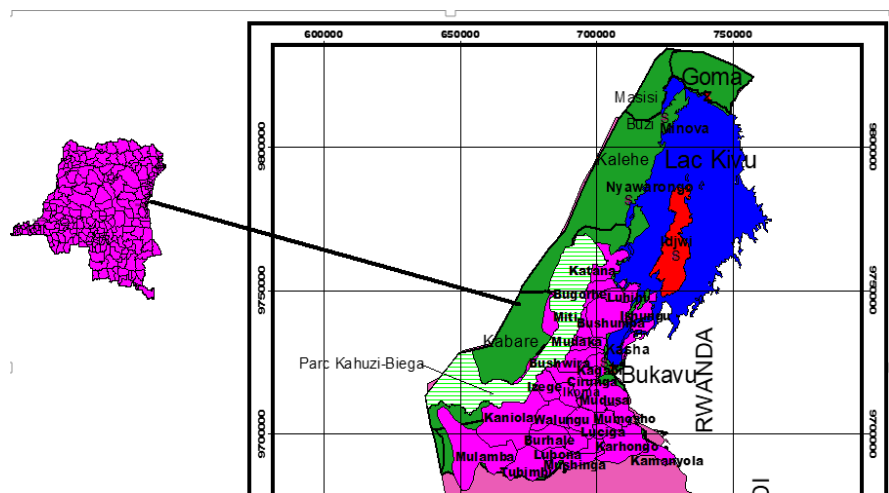


Figure 1. Location map of the study area (Source: Author's GIS work).

Both chiefdoms face common challenges. In some rural areas, access to basic services—such as education, healthcare, and drinking water—remains difficult. Population density in both chiefdoms forces communities to compete for available land, generating tensions and sometimes open conflict. In addition, the over-exploitation of agricultural land and pressure on natural resources, particularly in the Lake Kivu region, raise questions of long-term sustainability. In these regions, daily life, punctuated by work in the fields, local markets, and craft activities, demonstrates the resilience of a population that adapts to a constantly changing environment.

2.2. Data Collection Tools

The detailed questionnaire contains the following groups of study variables: Inde-

pendent variables represented by Socio-economic Characteristics and Dependent Variables: a) Extent of alcohol consumption; b) Community perception of alcoholism; c) Characteristics of consumers of strong alcoholic beverages; d) Social, economic, and cultural impact of alcohol; e) Drivers of alcoholism; and f) Remedial efforts undertaken by decision-makers and various social actors.

2.3. Data Collection Procedures

Simple sampling was used, taking care of the geographic representation of the administrative Divisions in the west, the center, and the east of the study area, choosing non-interconnected Divisions and villages. The detailed questionnaire was sent out in both chiefdoms, with a sample of 290 households: 30 people in each of the 5 selected Divisions in the Kabare chiefdom (Mudusa, Kagabi, Lugendo, Bugorhe, and Irhambi-Katana), and 28 people in each of the 5 selected Divisions in the Ngweshe chiefdom (Kamanyola, Karhongo, Walungu Centre, Kaniola, and Mulamba). Kabare and Ngweshe have 16 and 14 Divisions, respectively. A total of 120 people took part in focus groups in 10 clusters. We used Kobo collect software for data collection.

Scores were created to facilitate quantitative analysis of some very important qualitative variables: age, gender, marital status, level of education, religion, income, and household size, all matched against consumer status.

2.4. Sample Characteristics

The sample included 196 men (67.6%) and 94 women (32.4%). Married people dominated the sample: 201 (69.3%), 60 single (20.7%), 27 widowed (14%), and 2 divorced (1%). The age group 18 - 25 represented 23% of the sample; 26 - 35, 35%, followed by 36 - 45 (18%); 36 - 45 (18%), 46 - 55 (14%), 56 - 60 (7%), and 61 - 70 (2%). Those with incomplete or complete secondary education (54%), primairians (26%), university graduates (10%), and illiterates (10%).

2.5. Data Archiving and Analysis

The following software packages were used for data analysis: SPSS, Past, N'Vivo, and Jamovi. SPSS enabled us to generate descriptive statistics, such as means, medians, modes, variances, and standard deviations, to summarize the data. Comparison of means (Kruskal-Wallis) and chi-square tests. N'vivo was used for qualitative data analysis, producing clouds of the most frequent words in the data and syntax.

Multivariate analysis was performed using Past software for the discriminant analysis, Jasp for principal component analysis, and Jamovi for logistic regression. Principal Component Analysis allowed the computation of the relationship between socio-economic parameters and the consumption of strong alcoholic beverages. Discriminant analysis allowed the identification of the socio-economic characteristics of social groups (alcohol consumers and non-consumers). The logistic regression allowed the computation of links between the variables age, sex,

and religion vs alcohol consumption.

3. Results

3.1. Prevailing Opinions from Group Interviews

Group interviews conducted between April 26 and May 2, 2024, across several Divisions (localities) in Walungu and Kabare territories of South Kivu, DRC, were focused on the consumption of highly alcoholic beverages, its causes, consequences, and local responses. The key causes of alcohol abuse were mentioned. Poverty and unemployment, meaning lack of income and job opportunities, were the most cited factors. Alcohol becomes a coping mechanism for economic hardship. Cultural norms, too, in some regions, involve drinking being considered a symbol of masculinity or social acceptance. Also, state failure and poor regulation, allowing easy importation, lack of border control, and local authorities involved in alcohol production, contribute to proliferation. Social influence and boredom involving peer pressure, lack of meaningful activities, and stress encourage excessive consumption.

The participants indicated several socio-economic and health consequences; such as the destruction of households due to domestic violence, neglect of family duties, and marital breakdowns, which are widespread. Youth delinquency and school dropouts were mentioned as well. Young boys and girls increasingly consume alcohol, even in school settings. Economic decline is another consequence. Alcohol addiction leads to loss of productivity, and disposable income is spent on drinks. Health impacts include liver diseases, tuberculosis, malnutrition, and premature death. Cases even include deaths during alcohol “competitions.” Sexual dysfunction and gender imbalance are among the consequences. Men suffer impotence; women either leave homes or turn to transactional sex out of survival. The most affected social groups include the youth as the largest demographic consuming high-alcohol drinks, often unemployed and uneducated. Also, women who were once passive victims, but some now join production, consumption, or resort to survival strategies such as sex work. Local authorities and security forces are frequently cited too, as both enablers and beneficiaries of the alcohol trade.

Notable observations and testimonials involve children as young as 10 found drunk in public. Local drinks like “Kanyanga,” “Vinsoro,” “SIMBA,” and “Tambawichae” dominate consumption. High alcohol content beverages are preferred due to their low cost and potent effect.

Some local responses and proposed solutions include sensitization campaigns. Some communities attempted education and awareness sessions. There were attempts at sales restrictions; i.e., initiatives to limit sales before 3 PM or ban certain brands entirely. Grassroots enforcement has been observed in some villages, using local leaders, youth groups (“Rastas”), or churches to combat alcohol abuse. Unfortunately, institutional challenges such as corruption, economic dependence on the alcohol trade, and lack of enforcement undermine most efforts.

So, the group interviews portray a deeply entrenched cycle of poverty, addic-

tion, and institutional fragility. While communities recognize the issue and propose remedies, systemic barriers—especially economic desperation and governance lapses—make meaningful intervention difficult without broader structural reform.

3.2. The Extent of Strong Drink Consumption and the Effect of Age

Figure 2 shows that strong beverages are the most widely consumed, followed by local Kasiksi beverages, which are more or less sweet (5% ethanol), and industrial beers with an alcohol content varying between 5% - 7%. The majority of strong drinkers drink one bottle, followed by those who drink three bottles and then two bottles. Consumers of 4 - 6 bottles are less numerous. Clouds of dominant words, such as “*drinks*”, “*alcoholic*”, “*strong*”, underline the centrality of this theme in the corpus analyzed. Other words, such as “*consequences*”, “*family*”, “*addicts*” or “*destruction*”, illustrate the negative aspects associated with this excessive consumption, particularly in economic and social terms.

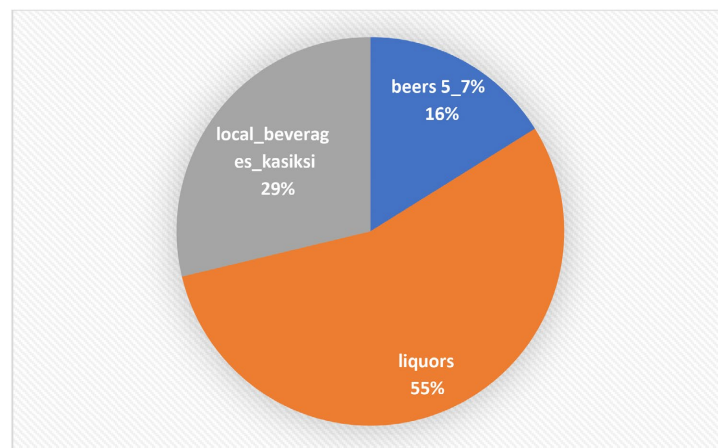


Figure 2. Types of beverages consumed.

The words “*destruction*”, “*bad*”, “*diseases*” convey the deleterious consequences of this excessive consumption on health, household stability, and the local economy. From these clouds, it emerges that strong alcoholic beverages have a negative influence on community life: addicts suffer from them, illnesses are recurrent, they are consumed on a group-wide scale, they engender bad habits, there is the hemp and drugs that accompany the consumption of strong alcoholic beverages, sexual violence, underdevelopment, unemployment, low production, the suffering of parents and households, a large quantity consumed, it even affects children,... All of the old people aged 61 - 70 ($n = 10$) drink. Middle-aged adults (36 - 45) drink heavily (92.5%), followed by young adults aged 18 - 25 (90.9%). This contrasts with those aged 26 - 35 (86.1%) and 46 - 55 (78.4%). Many of these young people started drinking strong alcoholic beverages at a very early age: 84% between the ages of 15 and 20, 14% between the ages of 21 and 30, and 2% between the ages of 31 and 40 (**Figure 3**). The number of alcohol-related deaths reported

by respondents (**Figure 4**) also illustrates the extent of alcoholism. Several witnesses acknowledged 1 - 5 cases of early death due to alcoholism and drug addiction in the last two years (55.2%). Others acknowledged at least 6 - 10 cases (7.2%) and 11 - 15 cases (0.7%).

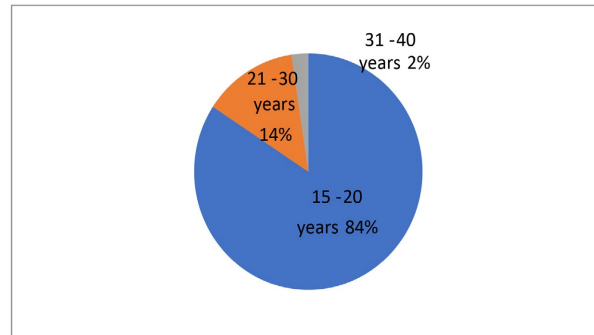


Figure 3. Age of strong drink consumption initiation.

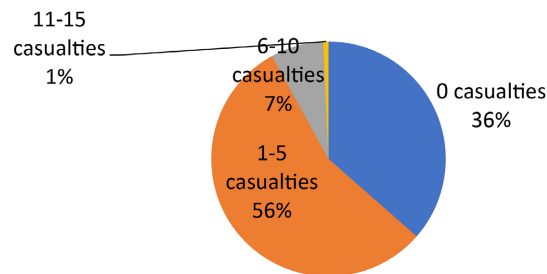


Figure 4. Mortality cases observed by respondents in their entourage.

3.3. Factors in the Consumption of Alcoholic Beverages

Several factors are at the root of the consumption of alcoholic beverages. These include government failure, increased unemployment, low levels of education in the community, lack of awareness of the harmful effects of strong alcoholic beverages, affordable cost, the disappearance of the banana tree in the Bushi, making worries disappear, satisfying the need to drink and/or quench thirst, poverty, camaraderie, household problems, alcohol dependency, banditry among young people, the multiplication of sales outlets in the villages, disappointments linked to life, famine in the area, having the strength to work, low level of education in the area, the influence of the area inhabited by many soldiers who do not live in the barracks but rather among the population, the high cost of industrial drinks, the availability of these drinks in the area, the easy production of these drinks, etc.

Unemployment is a major factor in the excessive consumption of alcoholic beverages. The unemployed spend long days in the village, wandering from house to house selling drinks in search of benefactors who will come to the rescue. This is called “Kudumba” in the language of the research community. This occurs from

morning until night. When they return home, fights ensue, especially when they find there is no food to eat. Absenteeism from work can be observed among consumers who are employed in certain village businesses and who, for reasons of drunkenness, are unable to go to work because they lack the strength for any kind of work.

Cultural heritage and custom dictate that men must drink alcohol, and enough of it, as it is a source of pride for their ancestors, as some of the people we met on the premises selling highly alcoholic beverages declared.

Early onset of alcohol consumption provides information on the age of onset of consumption of strong alcoholic beverages. Eighty-four percent of those surveyed began consuming alcoholic beverages between the ages of 15 and 20. The fact that they began consuming alcoholic beverages at a very early age has led them to become accustomed to them, and the drink has created a kind of pharmacoadddiction in them. They cannot get through a night without having consumed some alcohol and sometimes without having eaten, with many consequences for the body, the family, and society.

Among young people aged 18 - 36, the proportion of strong drinkers reached a record 85%, compared with 47% among older people (1.8 times higher). Thirty-two percent of these older people also consume considerably more industrial beers with 5% - 7% alcohol (32% vs. 9% among young people) and local "Kasiksi" soft drinks (21% vs. 6% among young people). This represents a shift by young people towards strong drinks. Young people with poorer land tenure status (tenants, bwasa, and Kalinzi) consume these strong drinks more frequently than those who have bought their land (93% vs. 74%), i.e., a 30% increase in the propensity to consume strong drinks, directly linked to the land tenure status of younger households (18 - 35 years).

3.4. Consequences of Drinking Strong Beverages

Alcoholism and Economic Situation

Among the consequences of alcoholism and drug addiction are family abandonment, malnutrition, fights, social conflicts, premature mortality, loss of employment, injuries, dislocation of households, sexual harassment, rape, sexual impotence in men, infidelity of users' wives, and recurrent illnesses among users. **Figure 5** shows a very strong negative impact of highly alcoholic beverages on well-being variables: income above all, access to food, and quality of housing. There is also a negative relationship between the consumption of alcoholic beverages and access to education, land capital, and household size.

It is well known that the children of alcoholic drinkers lead a poor life in poverty (85.9%). The poverty of strong drinkers is characterized by dilapidated houses with no furniture, bed and bedding, no paving, huts, and thatched roofs... Some are also land tenants. The results of the logistic regression show a highly significant influence of strong beverage consumption on the type of house where the family lives ($p = 0.008$).

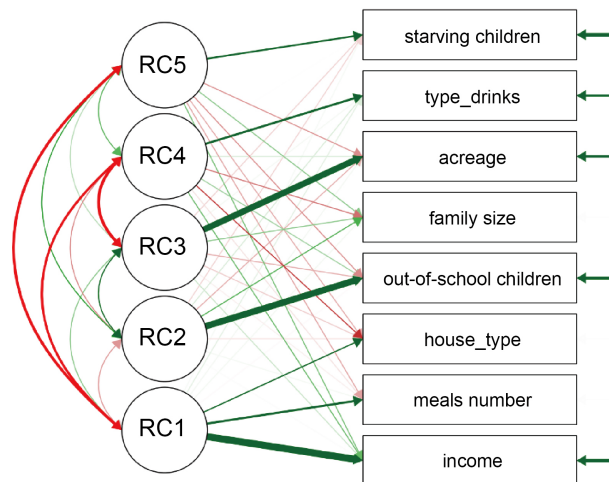


Figure 5. Principal component analysis in relation to the consumption of strong alcoholic beverages.

Alcoholics have poor hygiene facilities (78% of respondents). They have poor relations with neighbors (69%). Their economic life is poor (93%). Consumers of strong alcoholic beverages lead a difficult life, and unfortunately, they find it hard to pull themselves together. On the other side of the coin, the vast majority believe that alcoholic beverage sellers have a good standard of living (66.6%).

The discriminant analysis (**Figure 6**) shows two main social groups with regard to strong drink consumption: a) distinct strong drink consumers, and b) consumers comparable to non-drinkers in terms of the prosperity indicators measured here. In the second category, that of moderate or non-drinkers, we observe a higher monthly income, an improved type of house (semi-durable or permanent), a higher number of meals, a professional or university education, a larger area of land (0.75 - 1 ha), and a lower consumption of strong drinks (Kasiksi or 5% - 7% beers). This group also includes women in terms of alcohol consumption.

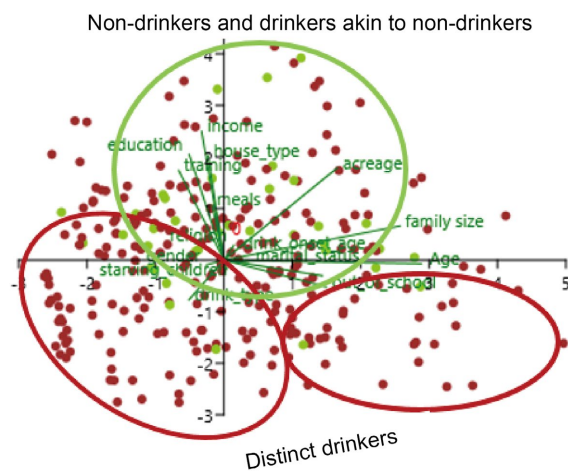


Figure 6. Discriminant analysis of social groups with regard to drinking consumption levels.

On the other hand, in the category of heavy drinkers, all indicators dropped in level, to the benefit of an increase in the number of school-age children not attending school and an increased household size.

Links between Acreage and Strong Drink Consumption

Alcohol consumption is highest among landless farmers (≤ 0.5 ha, 92.2%), as opposed to other categories (79% - 85%). Land tenants drink more (92.9%). The income-poor drink more ($< \$50$, 96.7%) as opposed to those with an income of $\$200$ (78.6%) (Figure 7).

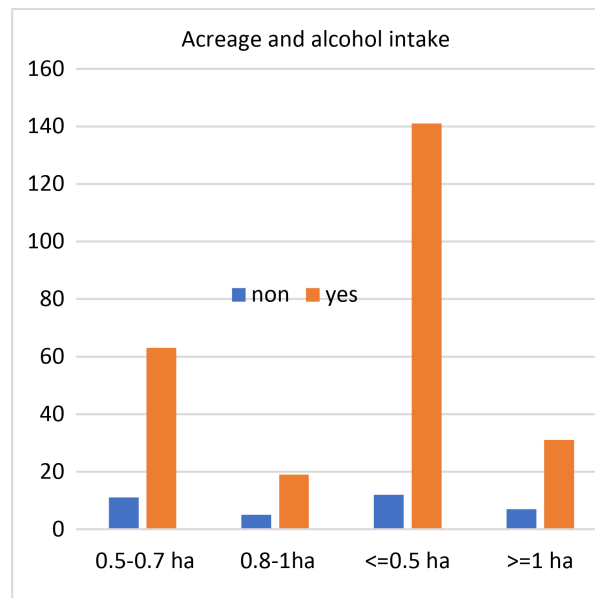


Figure 7. Relation between acreage and alcohol intake.

Within these income levels of $\$50 - 200$, local Kasiksi beverages predominate (61%) in households housed in semi-durable homes. Industrial beers with 5% - 7% ethanol are consumed more by those living in huts and mud houses (69%), compared with 19% by heads of households living in permanent homes.

3.5. Alcoholism and Religion

It is interesting to examine the influence of religion on standard of living and propensity to consume strong drinks. If we consider only high school and university graduates, we find 54% of Catholics consuming strong drinks and industrial beverages with 5% - 7% alcohol, versus 85% who consume the milder local drinks. Among Protestants, 43% drink strong beverages, compared with just 11% who drink milder local beverages. Overall, 94% of Catholics said they drink alcoholic beverages, compared with 74% of Protestants. Almost all non-religious people are strong drinkers (100%).

The relationship between alcoholism and religion (Figure 8) in the Bushi region is complex and multifaceted. There is the cultural and religious influence. Religion plays a central role in daily life. Traditional beliefs and religious practices can

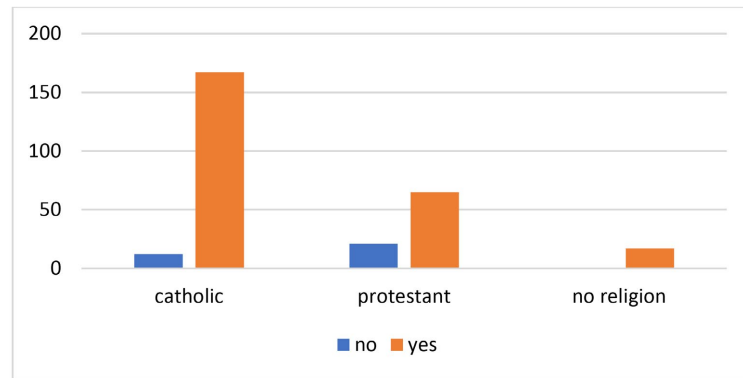


Figure 8. The relationship between alcoholism and religion.

influence attitudes towards alcohol. Some religions, such as Islam, prohibit the consumption of alcohol, while others may have more permissive interpretations. Alcohol is often present at certain religious ceremonies and celebrations. This can contribute to a normalization of alcohol consumption in some cultures, although it can also lead to alcohol-related problems. Religious communities can play a role in stigmatizing people with alcoholism, sometimes perceiving the condition as a lack of faith or moral discipline. However, many churches and religious organizations also offer support and rehabilitation programs to help those struggling with alcoholism. Some religious organizations run education campaigns on the dangers of alcoholism and promote healthy lifestyles. This can have a positive impact on reducing alcohol consumption in some communities. Poverty and lack of opportunity can also play a role in alcohol consumption. In this context, religions can offer social support, but they cannot always solve the underlying socio-economic problems that contribute to alcoholism.

In summary, the relationship between alcoholism and religion in the Bushi DRC is influenced by cultural, social, economic, and religious factors. Perceptions of alcohol vary considerably from one community to another, and religion's approach to alcohol can have both positive and negative effects.

Alcoholism and Household Size

Young people and small households have many more strong drinkers (1 - 3 people, 95.7%) than large households (9 - 12 people, 95.5%) or households with more than 12 people (100%); vs. 84% in households of 4 - 6 people and 7 - 8 people (81.2%). Thus, the intensity of alcohol consumption is in the shape of an inverted bell, being high in small (young) households, falling in medium-sized households (4 - 8, 81% - 84%), and rising again in very large households (**Figure 9**).

3.6. Alcohol, Obsolescence of Judgment, and Persistence in Error

Those who rated strong drinks highly consumed more of them (100%), in contrast to those who rated them poorly (87.4%). Non-drinkers consider that the children of drinkers live poorly compared to other children (13.7% vs. 2.5%; $\chi^2 = 4.03$ $p = 0.04$). Among strong drinkers, there was a greater perception of the circulation

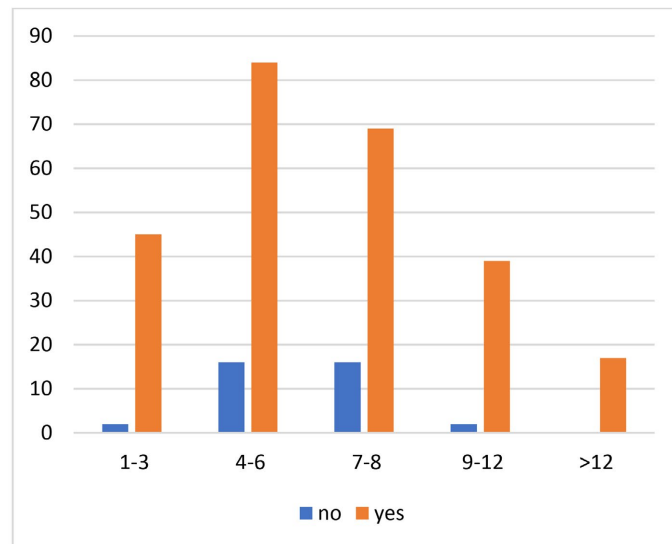


Figure 9. Alcohol consumption and household size.

of other drugs in their environment (22% vs. 10%, i.e., 2.2 times more; $\chi^2 = 5.56$; $p = 0.01$). Non-drinkers considered the economic situation of strong drinkers to be poor, as opposed to drinkers who considered their lives to be good (13% vs. 0%).

Alcohol Consumption and Gender

Figure 10 shows that men are much more likely to consume alcoholic beverages than women. This may indicate gender differences in drinking behaviour. In addition, a majority of respondents consume alcohol, although the proportion of female non-consumers is higher than that of men; 73.4% of women drink alcohol, significantly fewer than men (94.4%; $\chi^2 = 25$, $p = 0.001$).

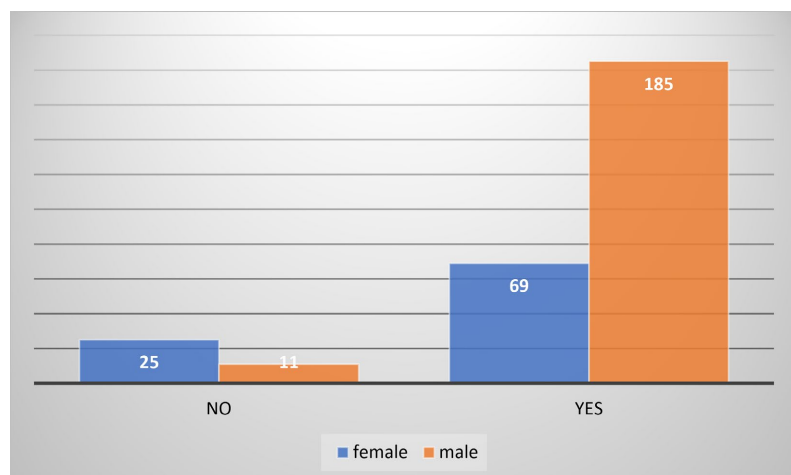


Figure 10. Alcoholism and gender

Alcoholism and gender in Bushi societies in the Democratic Republic of Congo (DRC) can be analyzed through several cultural, social, and economic dimensions:

a) Traditional gender roles: In many societies, including those of the Bushi, gender roles are often well-defined. Men may be socially encouraged to consume alcohol in contexts of celebration, socialization, or demonstration of virility. Women, on the other hand, may be socially stigmatized for excessive drinking, which can influence their relationship with alcohol and their drinking behavior.

b) Accessibility and control: Men may have easier access to alcohol because of their dominant economic and social position. This can lead to problem drinking among men, while women, often limited by economic or social constraints, may be less visible in discussions about alcohol.

c) Impact on health and family: Alcoholism in men can have serious repercussions on family dynamics. Domestic violence, often associated with alcohol-related behavior, can disproportionately affect women and children. Women can also be responsible for dealing with the consequences of alcoholism within the family.

d) Social perception: The perception of alcoholism can vary according to gender. Men may be more often valued for their drinking, while women may be judged harshly. This can create a double standard when it comes to drinking and alcoholism.

e) Prevention and education programs: Alcohol awareness and education initiatives can also take gender into account to better target the specific needs of men and women. Tailored programs can help reduce problem drinking behaviors and support individuals and families affected by alcoholism.

In short, the relationship between alcoholism and gender in the Bushi region of the DRC is complex and requires an integrated approach that takes into account cultural, economic, and social dynamics.

3.7. Alcoholism, Marital Status, Education, and Age

High proportions of single adults are alcohol drinkers (91.7%), as opposed to married (87.6%) or widowed (77.8%). A high proportion of alcohol drinkers (Figure 11) are illiterate (99.6%), as opposed to primairians (89.5%), university graduates (85.7%), and high school graduates (83.1%).

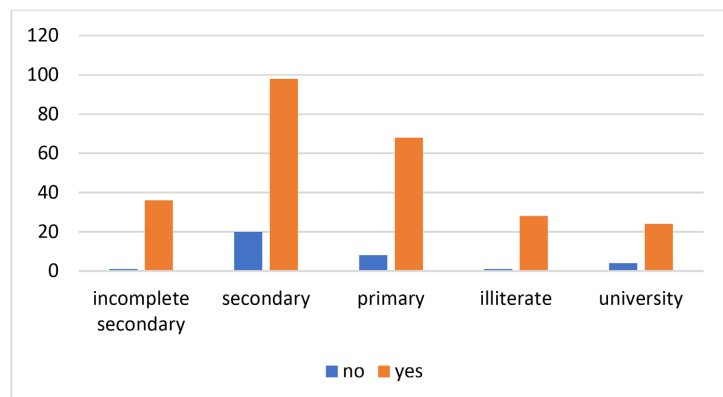


Figure 11. Alcohol consumption and education.

Table 1 shows the results of the logistic regression for the variables age, sex, and religion, which clearly show a significant relationship with alcohol consumption. Regression analysis shows that age, gender, and religion significantly influence the consumption of strong drinks. Middle-aged adults (36 - 46 years) have a higher propensity to consume hard liquor (92.5%) than people in their early 3rd years (56 - 60 years) (81.8%). Also, women have a lower propensity to consume hard liquor (73.4%) than men (94.4%). On the other hand, Catholics (93.3%) are more likely to drink hard liquor than Protestants (75.6%).

Table 1. Logistic regression for the variables age, sex, and religion vs. alcohol consumption.

Predictor	Estimate	SE	Z	p
Intercept	-3.507	0.918	-3.82005	<0.001
Age class (years):				
18 - 25 - 36 - 45	-0.163	0.882	-0.18518	0.853
26 - 35 - 36 - 45	0.237	0.753	0.31501	0.753
61 - 70 - 36 - 45	-15.345	3066.146	-0.005	0.996
46 - 55 - 36 - 45	0.919	0.872	1.05428	0.292
56 - 60 - 36 - 45	1.925	0.997	1.92954	0.054
Sex:				
Female—Male	2.464	0.558	4.41749	<0.001
Religion:				
Catholic—Protestant	-2.4	0.579	-4.14804	<0.001
Muslim—Protestant	1.68	1.678	1.0007	0.317
Witness of Jehovah—Protestant	19.337	6410.188	0.00302	0.998
None—Protestant	-17.017	2340.449	-0.00727	0.994
Branahmist—Protestant	-15.577	7004.237	-0.00222	0.998
Animist—Protestant	1.466	2.113	0.69381	0.488

Remarkably, among older adults aged 61 - 70, only strong drinkers were found, although their numbers were small in the sample (n = 10). Young adults aged 18 - 25 (90.9%) and those aged 26 - 35 (92.5%) are the biggest consumers of strong drinks. All respondents who declared no religion were strong drinkers (100%; n = 17). Many Protestant respondents also drink strong beverages (75.6%) (**Figure 12**).

3.8. Remedial Efforts by Decision-Makers and Various Social Players

3.8.1. Decision-Makers' Views on the Consumption of Strong Alcoholic Beverages

Decision-makers are unanimous in their view that the consumption of strong alcoholic beverages by their constituents is a bad habit (99.3%).

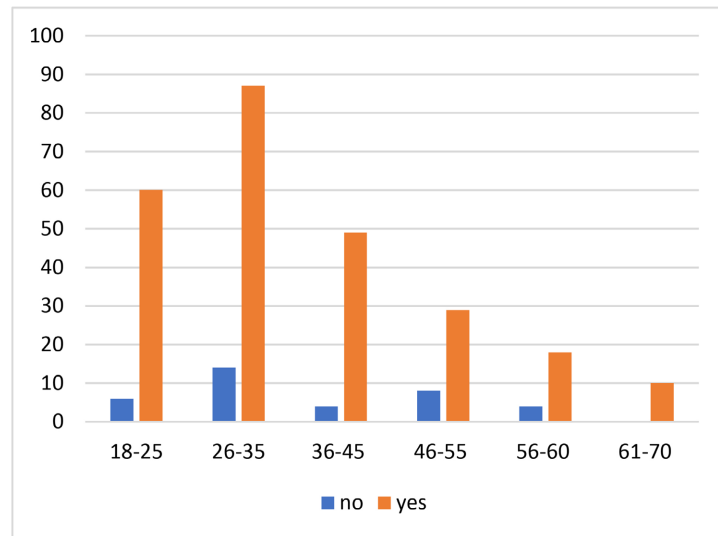


Figure 12. Alcohol consumption and age.

3.8.2. Measures Taken by Decision-Makers to Stop the Consumption of Strong Alcoholic Beverages and Their Level of Implementation

Decision-makers need to take action to put an end to alcoholism (99%). Remarkably, 62% believe that measures have been taken to counter the consumption of strong alcoholic beverages, while 38% do not recognize the measures that have been taken. However, few people mentioned the measures that have been taken:

- Confiscation and destruction of harmful beverages;
- Raising awareness among producers, retailers, and consumers;
- Sealing producers' homes;
- The arrest of those who produce it, in particular the military;
- Instructions to military personnel to stop drinking these harmful beverages, and to their wives to stop selling them.
- Regulation of consumption hours;
- Respondents felt that these measures were taken at the local level (chiefdom, group).

The place where these measurements are taken.

In general, they consider these measures to be ineffective (81%), effective (17%), or a hobby (2%). As for the proposals made by the community to decision-makers to limit the consumption of highly alcoholic beverages for sustainable socio-economic development, these clearly include a ban on the consumption of these beverages by ETDs, so that they do not become the chefs' milk cows, as well as a ban on importing and manufacturing them on territory.

3.8.3. The Community's Proposals to Decision-Makers to Limit the Consumption of Alcoholic Beverages for Sustainable Socio-Economic Development

The proposals put forward by the respondents can be summarized as follows:

- Enforcement of the law prohibiting the consumption of strong alcoholic beverages;

- A ban on taxes on these beverages in ETDs, as is currently the case;
- A ban on the manufacture and sale of these beverages in national territory;
- Put an end to the import of strong alcoholic beverages;
- Regulation of drinking hours for alcoholic beverages;
- Arrest of sellers and consumers of strong alcoholic beverages;
- Advise young people not to consume strong alcoholic beverages in order to preserve their health and their lives;
- Creating jobs and improving military salaries;
- Destruction of highly alcoholic beverages;
- The closure of the Rutshuru plant producing highly alcoholic beverages in NORD-KIVU;
- Strengthen the education of law enforcement officers and increase their numbers in the villages to ensure that the authorities' measures are properly followed up;
- Encourage the production of local soft drinks in compliance with standards, for example, Kasiksi;
- Avoiding corruption in the application of measures;
- Close down all establishments selling alcoholic beverages;
- Integrate young people into farming activities to avoid idleness;
- Prohibit police, military, and ANR agents from selling alcoholic beverages;
- Raise awareness, especially among young people, because these drinks destroy the body and kill.

4. Discussion

4.1. Age of First Drink and Age Class

Our results show that many of the consumers started drinking strong alcoholic beverages at a very early age: 84% between the ages of 15 - 20. Elsewhere, a study in Poland reported that 36.1% of adolescents had consumed alcohol, with the average age of initiation being around 13 - 14 years (Nowak et al., 2018). The age of first alcohol use varies considerably depending on numerous factors, including cultural norms, peer influence, family environment, and accessibility of alcohol.

Middle-aged adults (36 - 46 years) have a higher propensity to consume hard liquor than people in their early 3rd age class (56 - 60 years). Remarkably, among older adults aged 61 - 70, only strong drinkers were found, although their numbers were small in the sample. Young adults aged 18 - 25 and those aged 26 - 35 are the biggest consumers of strong drinks. Our results are in line with a study carried out in France among teenagers, which confirms that excessive alcohol consumption is evident among young people (Weill & Le Bourhis, 1994).

4.2. Alcohol Consumption and Education

Our results show a high proportion of alcohol drinkers among illiterates, as compared to primairians, high school graduates, and university graduates. Lower Education and Increased Risk of Alcohol-Related Harm: Several studies highlight a

stronger association between alcohol consumption and alcohol-related harm among individuals with lower educational attainment (Christensen et al., 2017; Norström & Landberg, 2020; Puka et al., 2022; Stock et al., 2011). This suggests that those with less education may be more vulnerable to the negative consequences of alcohol use. This may be due to differences in vulnerability and drinking patterns across educational groups (Christensen et al., 2017).

*Lower Education and Risky Drinking Patterns: Research indicates that individuals with lower educational levels may exhibit riskier drinking patterns, such as heavy episodic drinking or risky single-occasion drinking (Cardoso et al., 2015; Diress & Wondim, 2021; Grittner et al., 2013; Obradors-Rial et al., 2018; Zatońska et al., 2021).

4.3. Alcohol Consumption and Poverty

In our study, most consumers are landless farmers owning at least 0.5 ha. On average, 99.7% of households surveyed had 1 or 2 school-age children who did not attend school. The majority of the population has less than two meals a day, and there may be differences between quality and quantity. The majority of households earn their living from agriculture and wages, and the poorest are day laborers. Secondary sources of income are the sale of alcoholic beverages, sugar or water, handicrafts, and livestock. 80% of the population has a monthly income of less than 100 dollars. This situation proves that the population lives in a precarious situation, characterized by very low well-being indicators. This analysis is supported by similar studies, which stipulate that the health risks associated with addictions are higher among people living in precarious conditions or in poverty, whose health is often degraded and who have difficulty gaining access to care and prevention". (Vanjani et al. 2020) found a positive relationship between neighborhood poverty and alcohol abuse, suggesting that long-term or acute exposure to poverty influences alcohol use trajectories. This association was explained by the potential use of alcohol as a coping mechanism for stress related to poverty and a lack of collective efficacy in impoverished neighborhoods (McKinney et al., 2012). (Patel et al., 2020) highlighted how the financial burden of alcohol abuse perpetuates poverty, especially in low- and middle-income countries (LMICs), by leaving little money for basic household needs. A study in Tanzania found that alcohol availability, cost, and age of first drink were associated with at-risk alcohol use (Staton et al., 2020). A study in Uganda found that stress due to harsh economic conditions was a factor contributing to alcohol abuse among respondents (Ahabwe, 2023). Chaiyasong et al. (2018) found that drinking patterns vary significantly by gender, age, and country-level income. An analysis of data from the National Epidemiological Survey on Alcohol and Related Diseases, which assesses drinking behavior in relation to changes in occupational status at the individual level, suggests that periods of unemployment are associated with increased rates of binge drinking days. This relationship persists even after controlling for various demographic and socioeconomic factors, including age, race, marital sta-

tus, and income levels (Popovici & French, 2013).

4.4. Alcohol Consumption, Family Size, and Gender

The results indicate that the intensity of alcohol consumption is in the shape of an inverted bell, being high in small (young) households, falling in medium-sized households, and rising again in very large households. Higher proportions of single adults are alcohol drinkers, as compared to married or widowed individuals. This study found that in rural Vietnamese ethnic minority communes, an increase in household size increased the risk of poverty. Specifically, each additional family member increased the likelihood of poverty by 1.7%, holding other factors constant (Nguyen & Tran, 2021).

Our results show that women have a lower propensity to consume hard liquor (73.4%) than men (94.4%). In their cross-country study, Chaiyasong et al. (2018) found that men drank more frequently, consumed larger amounts typically, and were more likely to be higher-risk drinkers compared to women. These gender differences were more pronounced in middle-income countries (with the exception of South Africa). The largest gender ratios for heavier typical quantity and higher-risk drinking were observed in Vietnam, where most drinkers were male and much of the alcohol consumed was non-commercial.

Ahabwe (2023) indicated that alcohol abuse disproportionately affects women as victims of domestic violence. Schulte et al. (2009) noted that while adolescent girls and boys are equally likely to have tried alcohol, girls are less likely to be diagnosed with alcohol use disorder (AUD) or engage in problematic or binge drinking. The study highlights that different risk profiles are associated with gender differences in drinking behavior; e.g., because girls are more likely to experience abuse, depression, and anxiety, which are linked to higher drinking rates, while boys are more prone to externalizing disorders and impulsivity. McKinney et al. (2012) focused on binge drinking in committed relationships and suggested that men in impoverished neighborhoods may binge drink more often as a coping mechanism for stress, while women in such neighborhoods may have different caretaking responsibilities and cultural norms that lead to lower binge drinking rates (McKinney et al., 2012). (Staton et al., 2020) found that male patients were significantly more likely to report alcohol use and related consequences than female patients in Moshi, Tanzania.

Carvajal & Lerma-Cabrera (2025) indicated that underage males report more alcohol use than underage females across different WHO regions. It also notes that while women drink less than men, they may experience more alcohol-related problems. A study examining African Americans found that higher religious behaviors were associated with less alcohol use in women. For men, lower religious beliefs combined with a high passive spiritual health locus of control were associated with more alcohol consumption and heavier drinking. No moderation effects were found for smoking (Holt et al., 2015). A review of studies on alcohol use among college students noted that in the Arab region, where Islam (which pro-

hibits alcohol) is prevalent, alcohol use is still a problem, particularly among males. This highlights that religious beliefs do not always translate into complete abstinence (Karam et al., 2008). Quinn et al. (2023) suggested a weakening of the protective effect of religion against substance use.

Authors mention a complex interplay between alcohol consumption and gender, influenced by biological, social, and cultural factors. Women generally have a lower proportion of body water and a higher body fat percentage than men, leading to higher blood alcohol concentrations (BAC) for the same amount of alcohol consumed. This difference is due to differences in body composition and enzyme activity (Baraona et al., 2001; Komáreková et al., 2013; Mumenthaler et al., 1999). Women typically have lower activity of the enzyme alcohol dehydrogenase (ADH) in the stomach, resulting in less first-pass metabolism of alcohol. They also tend to have lower levels of aldehyde dehydrogenase (ALDH), further impacting alcohol processing (Baraona et al., 2001; Chrostek et al., 2003; Mumenthaler et al., 1999). Hormonal fluctuations in women, particularly estrogen levels, can influence alcohol metabolism and its effects. Pregnancy significantly increases the risks associated with alcohol consumption (Mumenthaler et al., 1999). Societal norms and expectations often differ for men and women regarding alcohol consumption, influencing drinking patterns and reporting behaviors. Heavier drinking may be more socially acceptable for men (Bo & Jaccard, 2020; Geigl et al., 2023). Access to alcohol and risk-taking behaviors related to alcohol consumption can also be influenced by social and cultural factors, which may vary by gender (Geigl et al., 2023).

Women are more susceptible to certain alcohol-related health problems, such as liver disease (cirrhosis) and breast cancer, even at lower levels of consumption compared to men (Anouti & Mellinger, 2022; Fernandez-Solà & Nicolas-Arfelis, 2002). The impact of alcohol on mental health can also differ between genders, with women potentially more vulnerable to certain conditions exacerbated by alcohol use (Green et al., 2004; Yue et al., 2023). Alcohol-associated liver disease (ALD) rates are rising, with women experiencing a greater increase in alcohol use disorder (AUD) and a higher risk of ALD due to biological differences (Anouti & Mellinger, 2022).

4.5. Alcohol Consumption and Religion

Higher proportions of Catholics (93.3%) are more likely to drink hard liquor than Protestants (75.6%), whose religion forbids alcohol consumption. All of the respondents who declared no religion were strong drinkers. Lahu et al. (2024), who conducted a study on adolescents in Kosovo, found that religious beliefs were a reason for not drinking alcohol among some respondents. In Burkina Faso, Nassè et al. (2022) showed that strong religious practices were associated with higher purchases of non-alcoholic beverages. In Jamaica, Weaver et al. (2018) found a positive association between Christian religious affiliation and alcohol consumption. In a systematic review, Chagas et al. (2022) found that religious individuals

tended to have lower alcohol consumption compared to non-religious individuals when religions were analyzed together. [Usman et al. \(2022\)](#) found that religion was a significant correlate of alcohol consumption in India, highlighting the influence of religious beliefs and practices on drinking behaviors within a specific cultural context. [Amit et al. \(2013\)](#) showed that Muslim men were less likely to drink than Christian men, illustrating the influence of religious beliefs on alcohol consumption in rural Malaysia, within a specific cultural setting.

4.6. Regulations and Perspectives

In our study, we found that the measures were largely sabotaged by the producers and sellers of these highly alcoholic beverages, who had been able to obtain operating and sales authorizations at both the provincial and national levels. Corruption and the fact that some of the people who are supposed to be enforcing the law are themselves sellers or consumers are the reasons behind the inactivity of the competent authorities. Alcohol is often consumed in a more harmful way in developing countries and is likely to interact with malnutrition, poor housing, and other aspects of lower living standards, increasing the risk of mortality and morbidity ([Poznyak et al., 2005](#)). A study comparing alcohol regulation policy and alcohol consumption in 30 countries found that alcohol regulation policy has a positive impact on alcohol consumption. However, another study carried out in 2014 shows that the informal system of alcohol production does not allow for the effective implementation of these regulation policies ([Brand et al., 2007](#)). Corruption and inactivity of government institutions in Africa lead some authorities to pursue personal interests to the detriment of the well-being of all ([William, 2023](#)).

The recommendation made by the interviewees was that local authorities should get more involved in prohibiting and punishing those who produce and import these drinks, but others felt that the measures taken were also unsuccessful. In addition, the fact that some beverages are sold in the sellers' homes can sometimes lead to confusion and prevent certain authorities from taking concrete action.

4.7. The Interaction of Factors

Figure 13 illustrates the factors influencing alcohol consumption and the associated socio-economic consequences, taking into account contextual variables. This is a complex system, where multidimensional interactions create feedback loops. Among the determining factors we note "Occupation and family load" and "Context and life history." These dimensions influence income and alcohol consumption, directly or indirectly. In terms of intermediate consequences, we include alcohol consumption and income, which interact in a loop, with repercussions on several aspects of social and economic life. Among the final impacts, that affect key dimensions such as poverty, prosperity, and access to opportunities, encompassing aspects such as education, housing, and food security. Our results led to

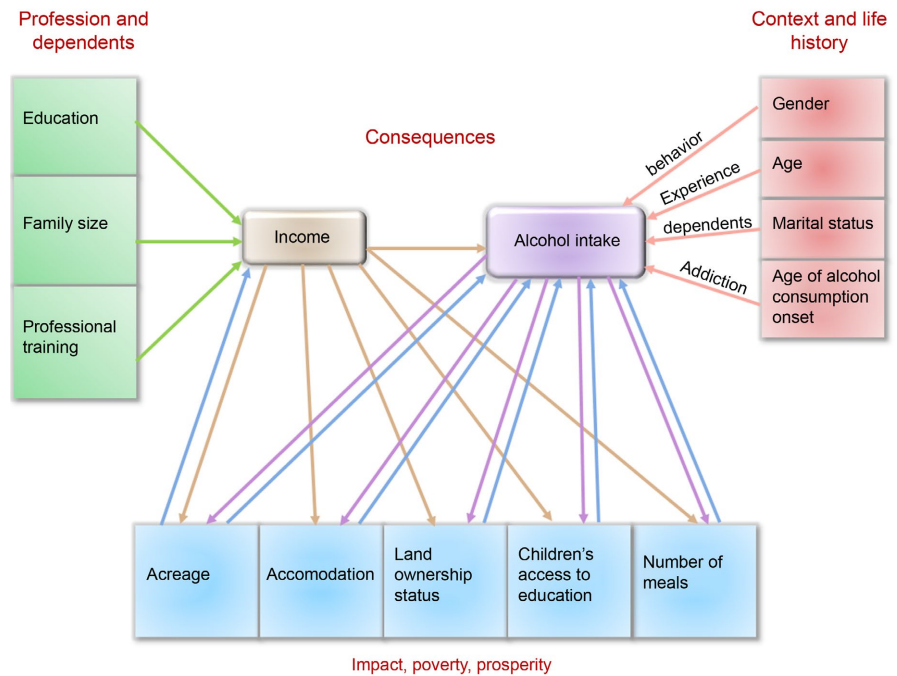


Figure 13. Conceptual model of the relationship between strong drink consumption and standard of living.

the identification of several components linked to the consumption of strong drinks. In the occupation and burden component, we find the level of education, which conditions access to well-paid jobs, influencing family income; a low level of education may also be linked to a lack of awareness of the risks of excessive alcohol consumption. Household size can be an additional financial burden, reducing the ability to save or invest in family well-being. This can generate increased stress, potentially linked to compensatory behaviors such as drinking. In turn, vocational training determines professional opportunities and economic stability, two critical factors in limiting the risks associated with alcoholism. A lack of vocational training can increase job insecurity and stress, which are potential triggers for risky behavior.

In the Context and Life History component, we note gender. Men and women may behave differently towards alcohol, depending on social norms and cultural pressures. For example, in some societies, alcohol consumption is more tolerated among men. The risk of problem drinking can vary with age. Young adults are often more vulnerable to social influences, while older people may drink to cope with loneliness or health problems. Marital status also has an effect. Married people may benefit from social or family support that limits excessive drinking, while single or divorced people may be more at risk. The age of alcohol initiation has an influence on the future. An early start is often associated with an increased risk of addiction and problem behaviors in adulthood. Our results show that many consumers started drinking around the age of 15. Income plays a central role in the pattern, both as a cause and a consequence. A high income helps to improve living conditions (housing, education, food), thus reducing the stress factors that can

lead to alcohol consumption. Alcohol consumption can reduce income through absenteeism, lower productivity, alcohol-related expenses and, in some cases, medical or legal costs. Alcohol consumption is the central element in the pattern, influenced by a number of factors and having a variety of consequences. Alcohol modifies individual behavior, which can lead to family conflicts, increased violence or altered social relationships. Regular drinking may be linked to traumatic antecedents or difficult life experiences. Excessive drinking can become a burden on loved ones and the community. The result is addiction. Alcohol dependence amplifies the negative impacts, creating a vicious circle that is difficult to break.

Related socio-economic factors: Alcohol intake and income influence concrete dimensions: Land area, Type of housing, land tenure status, children's access to education, number of meals. A large landholding is a capital asset that may reflect economic stability, while a small area may indicate greater precariousness. Housing type is a direct indicator of living conditions and is affected by income. Owning or renting a home influences financial stability and, potentially, stress levels. Excessive alcohol consumption can divert the financial resources needed to finance education. Food insecurity can result from economic insecurity and be exacerbated by alcohol-related expenses.

There are feedback loops: between income and alcohol. Increased alcohol consumption reduces economic capacity (through loss of productivity or unnecessary expenditure), worsening living conditions, which can encourage further alcohol consumption. There are also multiplier effects of context. Factors such as education, marital status, or age of onset directly influence drinking behavior, creating a cumulative effect that spreads across other dimensions. There are also global impacts such as poverty, prosperity, and human development. Excessive alcohol consumption can exacerbate poverty through its negative impact on income, health, and family structure. Conversely, targeted interventions (such as education or prevention) can limit consumption and promote prosperity by breaking the cycle of precariousness. Aspects such as education, housing, and food security are directly linked to the interaction between income and alcohol consumption.

5. Study Limitations

The limitations of this study include the reliance on self-reported consumption data, which may be subject to social desirability bias, and the non-inclusion of some factors, such as heredity.

6. Conclusion

This study reveals a critical public health issue in the Bushi region of the DRC: the widespread and detrimental consumption of strong alcoholic beverages, particularly among young adults. The high prevalence of alcohol abuse, often starting at a young age, is strongly linked to significant negative consequences across multiple sectors. These consequences include widespread alcoholism, high rates of alcohol-related mortality, family breakdown, economic hardship (manifested in un-

employment, poverty, and reduced productivity), and pervasive social problems such as violence and conflict.

The research highlights the complex interplay of factors contributing to this problem. Socioeconomic factors such as land tenure, income levels, and unemployment play a significant role, with landless and impoverished individuals exhibiting higher rates of alcohol consumption. During the interviews, poverty and unemployment, meaning lack of income and job opportunities, are the most cited factors of alcohol consumption. Actually, this opinion was confirmed by the quantitative links between wealth indicators, like land holding, income, and house type, highlighting the importance of job creation among the community-proposed solutions. Alcohol becomes a coping mechanism for economic hardship. Cultural norms and traditions, including the perceived social acceptance of alcohol consumption among men and the influence of religious practices, also contribute to the problem. Furthermore, the study underscores the limited effectiveness of current interventions implemented by decision-makers, highlighting the need for more comprehensive and robust strategies.

The community's proposals for addressing this issue include stricter enforcement of existing laws, bans on the production and import of strong alcoholic beverages, job creation initiatives, and increased awareness campaigns targeting youth. The study emphasizes the urgent need for a multi-pronged approach that addresses both the immediate health consequences of alcohol abuse and the underlying socioeconomic factors that contribute to its prevalence. Future research should focus on evaluating the effectiveness of different intervention strategies tailored to the specific context of the Bushi region, considering the cultural, social, and economic factors identified in this study. Ultimately, addressing this public health crisis is crucial for promoting sustainable socio-economic development and improving the overall well-being of the Bushi community.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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