Scientific Research Publishing

Open Journal of Social Sciences, 2025, 13(9), 383-418
https://www.scirp.org/journal/jss
ISSN Online: 2327-5960
ISSN Print: 2327-5952

Rural and Suburban Living Conditions in the Kivu Highlands

Jean-Berckmans Bahananga Muhigwa[1*], Romain Ntabiruba Lwaboshi[2], Valerien Bishikwabo Kasereka[3], Godefroid Baguma Kabobya[2]

[1]Faculty of Sciences, Université Officielle de Bukavu (UOB), Bukavu, Democratic Republic of the Congo
[2]Institut Supérieur de Développement Rural de Bukavu (ISDR-Bukavu), Bukavu, Democratic Republic of the Congo
[3]International Institute of Tropical Agriculture (IITA), Bukavu, Democratic Republic of the Congo
Email: *jeanbahananga61@gmail.com, lwabo2003@yahoo.fr, sikashasbl@gmail.com, valerykas@gmail.com

How to cite this paper: Muhigwa, J.-B. B., Lwaboshi, R. N., Kasereka, V. B., & Kaboby, G. B. (2025). Rural and Suburban Living Conditions in the Kivu Highlands. *Open Journal of Social Sciences, 13,* 383-418.
https://doi.org/10.4236/jss.2025.139024

Received: July 30, 2025
Accepted: September 21, 2025
Published: September 24, 2025

Abstract

This study assessed living conditions and development levels in 16 administrative Divisions in South Kivu. The aim was to estimate the level of indicators of welfare and access to basic social services, the situation of agro-pastoral activities, and the impact of local development associations, with a view to providing basic statistics for local development plans across the various ecoregions and highlighting links with life standards in similar conditions. We used interviews, focus groups, and statistical analysis. The survey questionnaire was submitted to a total of 1,120 people, including 960 individual interviews and 160 participants in 16 focus groups. The results show that households' level of access to basic social services is limited; a considerable proportion of the population has no access to healthcare; among households with 5 - 8 children, many are out of school due to lack of financial means; and households seldom have access to electric power. In addition, few have tapped water at home. They must travel considerable distances to reach a drinking water source. The majority of people live on agro-pastoral activities. Family landholdings are generally small. The monthly income declared is low. Farmer supervision is weak, as is support from development associations and the State. Access to microcredit is poor. In many places, children walk more than 2 km to reach primary and secondary schools. Housing is typically indecent, and infrastructure is in poor condition. This information is instrumental for archiving livelihood situations before the current war, which resurged in 2022 in this focus region.

Keywords

Welfare, Rural, Suburban, Tropical

1. Introduction

Several authors have demonstrated that the rules of access to land are complex nowadays. Land has always been recognized as a primary source of wealth, social status, and power. Access to land is significantly linked to decision-making power at the family, community, and national levels (Gniza, 2021). Chauveau et al. (2006) argued that the rules governing access to land and the management of renewable resources are at the heart of agricultural development and sustainable ecosystem management. In rural West Africa, the land issue is characterized by increasing commodification and heightened competition between players (both rural and urban land investors), with little or poor regulation due to social and economic changes, contradictions in public policies, and failures in conflict arbitration systems. IIED (2017) points out that the right to land, once allocated by chiefs within the community, is now changing hands in a multitude of ways. Wealthy and well-connected individuals inside and outside the community are frequently able to override local statutory or customary land rights, dispossess occupants, or force them to parcel out already modest plots of land.

Given that women are key players in rural production, Gniza (2021) econometrically evaluated the causes of the gender productivity gap; this is to facilitate the design of policies geared towards women's empowerment. The results show that female farm managers are 26% less productive than their male counterparts. This implies that policymakers must reform customary laws that do not allow women to own land. In addition, unequal land rights, which stem from differences in status, religion, and customary and local norms, disadvantage women, perpetuate poverty, and accentuate gender inequalities. Women account for only 15% of landowners in Africa (FAO, 2011).

Jodha (2002) showed that in many developing countries, environmental degradation in the countryside has little to do with modern cropping systems or intensive agriculture. The poor, in fact, often practice low-intensity agriculture in marginal areas. The increasing rate of soil degradation and groundwater depletion poses an increasingly serious threat to the future. Reducing poverty means empowering the rural poor, both men and women, to transform their own lives and livelihoods, and helping public authorities and civil society to create the conditions in which they can do so. Rural life can be made more pleasant by promoting youth, women, and the environment. Specifically regarding the youth, the issue of jobs is a major concern for young people.

Arsalan (2019) predicts that extreme poverty and hunger will be increasingly concentrated in fragile countries. Moderate poverty will remain high in Asia and sub-Saharan Africa, mainly in rural areas. Inequalities between women and men in education, employment, remuneration, physical security, and available time remain deeply entrenched in rural societies (Report of the Commission on the Status of Women, 2018). The rapid increase in the number of rural young people in Africa represents a considerable challenge in terms of employment.

Rural geographical disparities (i.e., inequalities between eco-regions) must be

considered for all spatial planning purposes. Gonin and Queva (2016) found that rural areas are characterized by major disparities, in terms of population, standard of living, facilities, or dynamism of activities. These territorial inequalities are visible on all scales, both between and within different countries. The major determinants of rural development are multifaceted and interconnected, encompassing economic, social, environmental, institutional, and infrastructural factors. Increased income levels and diverse employment opportunities are crucial for improving living standards and reducing poverty. Studies consistently highlight the importance of economic growth and diversification beyond agriculture (Hoang, 2020; Yesigat & Awoke, 2024; Demchenko et al., 2023). Access to credit and financial services also plays a significant role (Adejobi & Kassali, 2013; Yesigat & Awoke, 2024). While diversification is important, agricultural productivity remains a cornerstone of rural economies. Improved farming techniques, access to improved seeds and inputs, and efficient market access are key (Adejobi & Kassali, 2013).

Adequate infrastructure, including transportation, communication, and energy, is essential for connecting rural areas to markets and facilitating economic activities (Demchenko et al., 2023; Knieć & Goszczyński, 2022). Access to information and communication technologies (ICTs) is increasingly recognized as a critical driver of economic development (Aslam et al., 2024; Tham et al., 2021). Improved education levels and skills development are vital for enhancing productivity and creating opportunities (Yesigat & Awoke, 2024; Drago et al., 2020; Demchenko et al., 2023; Westgard & Alnasser, 2017; Aslam et al., 2024). This includes both formal education and access to relevant training and skills development programs. Good health and access to quality healthcare are essential for a productive workforce and improved quality of life (Singh, 2025; Uprety, 2025; Moskvicheva et al., 2025). Addressing social determinants of health, such as poverty, inequality, and access to resources, is crucial (Backonja et al., 2022; Shrestha et al., 2023; Uprety, 2025).

Strong social networks, trust, and community participation are vital for collective action and effective governance (Wang & Wang, 2023; Knieć & Goszczyński, 2022). Empowering local communities and fostering participatory development approaches are essential (Macken-Walsh & Curtin, 2013; Ibani, 2019). Empowering women and promoting gender equality are crucial for unlocking the full potential of rural communities (Yesigat & Awoke, 2024; Ijatuyi et al., 2022; Khazami et al., 2023; Zhou & Lai, 2023). Addressing gender inequalities in access to resources, education, and opportunities is essential.

Sustainable management of natural resources, including land, water, and forests, is crucial for long-term rural development. This includes addressing issues such as deforestation, soil erosion, and water scarcity. Effective governance, transparency, and accountability are essential for creating a conducive environment for investment and development (Knieć & Goszczyński, 2022; Sharma, 2021). This includes strengthening local governance structures and promoting participatory

decision-making processes. Appropriate policies and regulations are needed to support rural development initiatives, including agricultural policies, infrastructure development policies, and social protection programs (Hoang, 2020; Menyah et al., 2020; Leimbigler et al., 2022). Access to information and technology is crucial for improving decision-making, enhancing productivity, and connecting rural communities to wider markets (Aslam et al., 2024; Tham et al., 2021). Preserving and promoting local culture and heritage can contribute to rural development through tourism (Ray, 2013; Chinniah & Anuar, 2025). This requires careful planning and management to ensure that tourism benefits local communities sustainably. Successful rural development requires a holistic and integrated approach that addresses these multiple factors simultaneously.

In the DRC, poverty statistics are more than alarming (Ministère du Plan, République Démocratique du Congo, 2011). They found that 7 out of 10 are poor, with a disparity between rural households and urban areas. In rural areas, around 8 out of 10 households are poor, compared with 7 out of 10 in urban areas. Food accounts for 62% of all Congolese household expenditure. This structure of Congolese households reveals that any inflation affecting food products would reduce their real income expenditure, and, all other things being equal, increase the number of poor and vulnerable people. These data reveal that poverty reduction requires the implementation of an economic policy conducive to strong growth, i.e., economic growth at least twice as high as demographic growth (3.1%), coupled with a sound distributive policy, if we hope to halve poverty, in line with the advocacy document for the mobilization of resources to achieve the Sustainable Development Goals in the DRC. These facets of poverty can be observed in both urban and rural areas. The poverty of Congolese society is also perceptible through growing social phenomena that reflect a profound social crisis. In its 2011 annual HDI report, the UNDP estimated that over 71% of Congolese live on less than $1 per day. In other words, poverty in the DRC is mass poverty, affecting several socio-professional categories. In addition, according to the UNDP, per capita income has seen a critical trend.

South Kivu province is one of the three poorest provinces in the DRC. It has a poverty rate of 84.7%, accounting for 8.3% of the DRC's poor people. The analysis reveals that poverty is most prevalent among households headed by inactive, unemployed, or retired persons (89.1%), followed by those headed by informal agricultural workers (86.6%). The level of education is also a discriminating factor in the standard of living in South Kivu, but the disparity according to this determinant is less marked than in the DRC as a whole (Ministère du Plan, République Démocratique du Congo, 2011).

The current study was carried out in mountainous Kivu, a region that was even the subject of an atypical Malthusian experiment championed by Father Lacoste's VIPAM project. The aim was to stimulate the exodus of families from overpopulated mountain regions lacking in agricultural land to less populated, lowland areas. The experiment was unsuccessful, however, due to malaria at lower elevations

and customs that bind people to the land of their birth. In this case, strengthening alternative non-agricultural employment and optimizing access to scarce farmland was imperative.

In this context, we propose analyzing the living conditions in this region by comparing scattered villages, rural commercial centers, and suburban environments. This takes ecoregions into account, in a quest to understand the effects of geographical disparities. This information is instrumental for archiving livelihood situations before the current war, which resurged in 2022 in this region.

2. Methodology

Conceptual framework

While analyzing the living conditions in rural areas, it is essential to define what "living conditions" entail in the rural context. Previous authors indicate that human living conditions encompass the opportunities available to meet everyday needs across various spheres of life (Wojewódzka-Wiewiórska & Atkočiūnienė, 2020). These include: 1) Housing, i.e., satisfaction with accommodation conditions and housing precariousness (Anthopoulou et al., 2019; Wojewódzka-Wiewiórska & Atkočiūnienė, 2020); 2) Basic Services, e.g., Access to trade, gastronomy, living services, healthcare, education, culture, and leisure (Wojewódzka-Wiewiórska & Atkočiūnienė, 2020); and 3) Infrastructure, including the availability and quality of social infrastructure, such as roads, digital connectivity, and utilities like water, sanitation, and energy (Gontijo et al., 2024; Lupenko et al., 2024; Santos et al., 2024; Wojewódzka-Wiewiórska & Atkočiūnienė, 2020; Zakshevsky et al., 2019).

4) Material Well-being involves the economic situation, including income, wages, and the ability to make ends meet, which directly influences material deprivation (Chowdhury et al., 2023; Wojewódzka-Wiewiórska et al., 2019; Wojewódzka-Wiewiórska & Atkočiūnienė, 2020). 5) Health and Well-being: Physical and mental health, including access to medical services, environmental health, and overall well-being (Chowdhury et al., 2023; Tint et al., 2025; Vickerman et al., 2025; Wojewódzka-Wiewiórska et al., 2019; Wojewódzka-Wiewiórska & Atkočiūnienė, 2020). In essence, living conditions reflect the overall environment and resources available to rural residents that shape their daily lives.

A theoretical framework for studying living conditions in rural areas requires a comprehensive approach that acknowledges the multifaceted nature of rural life and the various factors influencing it. Such a framework can be built upon several interconnected dimensions and influencing factors, ultimately impacting the quality of life and sustainable development in these areas.

3. Methods

Figure 1 illustrates the study area around Lake Kivu, DRC. From November to May 2017, we went out into the field and submitted a detailed survey questionnaire to our respondents for data collection. Once at the office of the administra-

tive Division (Groupement), we received authorization before starting our research, and at the same time we acquired some information about the entity; notably its delimitation, population, and administrative subdivision. An administrative Division generally has a maximum population of 35,000.

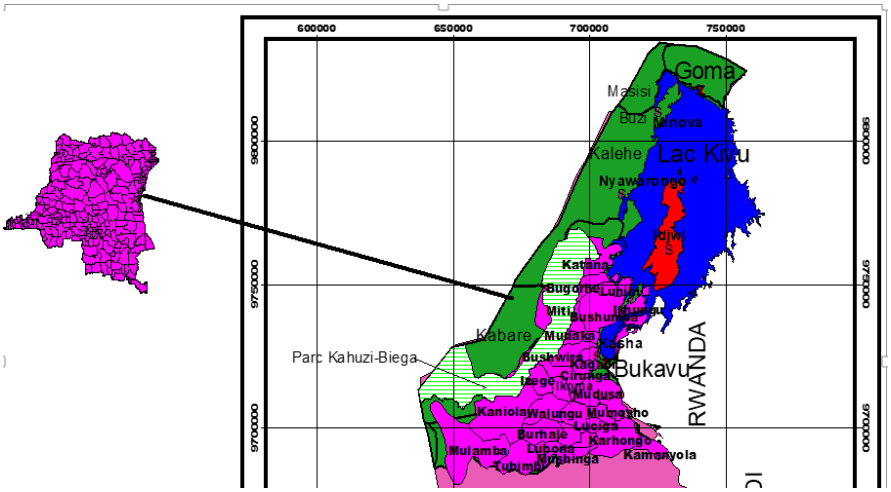

Figure 1. Location map of the study area (source: authors).

We found some respondents in their homes, in the fields, and in small shopping centers in the area where we had to carry out the focus group. In view of the complexity of the survey questionnaire, the need to save time, and the difficulty of reaching the entire population, we set ourselves a sample of 60 households per Division by convenience, spread over 5 - 6 unrelated villages. Surveys were conducted with heads of households and focus groups with 10 village leaders. The response rate was typically above 95%.

The study variables included indicators of access to health (i.e., self-medicating or not), education (number of children of school age out of school), and household comfort (type of main house); membership in a village development association; rural activities and natural resource management (agriculture, livestock); food security (number of daily meals); and local environmental problems. The survey lasted 6 - 10 days per Division.

A total of 130 variables were secondarily tabulated. Columns with missing data were dropped from the analysis, although they were eventually revisited when discussing a particular Division. The scores represented the responses received from respondents according to their perception and prioritization of their local realities. The decoded data were analyzed using Xlstat, 2014.

Frequencies were used to produce pie charts for qualitative variables. Descriptive statistics and correlations between quantitative variables were computed. The principal components, correspondences, and cluster classification were analyzed using Xlstat 2014. The main classes were then subjected to ANOVA to compare means. Thus, sub-urban Estates were compared with rural Divisions, and within the rural areas, low agricultural production entities were contrasted with those

generally recognized as major agricultural production poles, while commercial rural centers were compared with scattered villages. Some dependent variables were subjected to multiple regression and logistic regression against independent variables.

4. Results

4.1. Family Size and Income Sources

The average family size is 8. It does not vary significantly between suburban and rural areas (mean 7.7 ± 1.26). This means that 95% of households are made up of 6.4 - 9 members. The polygamy rate is 14% overall, which is higher in the less fertile highlands (16%) than in the more productive lowlands (10%), which include Kamanyola and Buzi-Bulenga. Polygamy rates are lower in the suburbs (8.5%). The widowhood rate is approximately 6%. Divorce and separation of couples are much higher in the suburban areas (8% vs. 4% in rural areas).

The main activities are farming and livestock rearing; in Divisions located near the lakeshores, fishing is a secondary activity (10%); handicrafts and salaried work occupy some households. Employment opportunities are very limited. Theft of nets and murder have caused many fishermen to abandon fisheries in Lake Kivu. Young people who remain in the village after secondary school take up teaching when they find a job. The proportion of households with paid employment was very low (9%). This reflects a very high rate of unemployment, apart from small trade, which accounts for 18% of households in the region as a whole, and 12% - 16% in rural areas, where farming and livestock breeding are practiced by 62% - 76% of households.

Monthly incomes are on the order of $60 ± $15.86. This means that approximately 95% of households have a main monthly cash income between $44 - 76. Compared with the cost of living, in a situation where almost all items are imported, including food, this income is insufficient. In fact, many wage earners receive between $31 - 50 a month, which they try to supplement with other small resources, in a context where the family size is around 8 and where only the father and, increasingly, also the mother bring in the cash income. **Figure 2** shows that most households have between 5 - 10 members.

Overall, the acreage per household varies considerably (cv 106%); 95% lie between 0 - 2.1 ha, but in the less fertile highland Bushi region, 95% of households farm on 0.7 - 1.6 ha, just 0.75 ha on average. Farmlands cover 1.6 - 1.8 ha per household in the more favored rural lowlands. Farmers rarely know the exact size of their fields or the quantities harvested. In the market and in everyday practices, the metric system (scales, capacity units, etc.) is ignored in favor of approximate units (**Figure 3**).

In the past, the banana plant was the lifeblood of the household economy, but bacterial wilt disease ruined it. In some productive areas, market gardening accounts for up to 12% of the crops grown. Sweet potatoes are a staple crop. However, in the Ruzizi valley around Kamanyola, maize takes second place, with cas-

sava and beans.

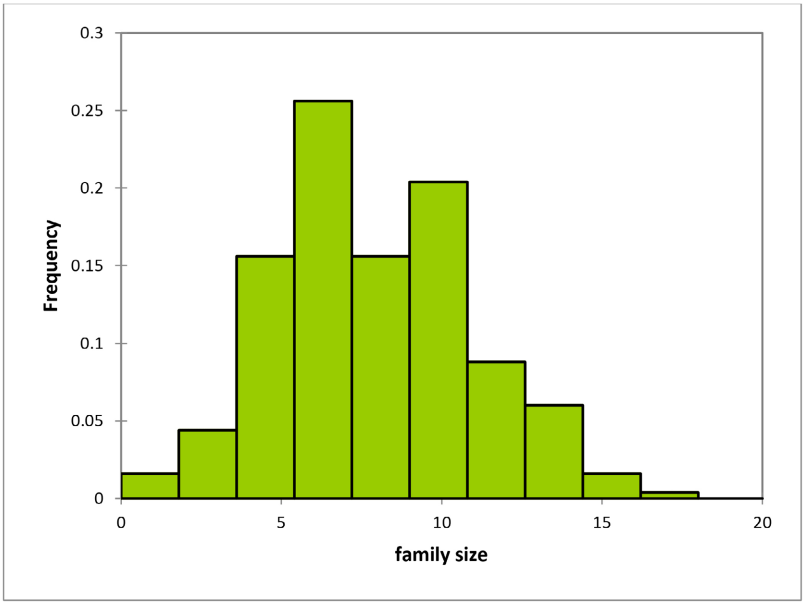

Figure 2. Family size.

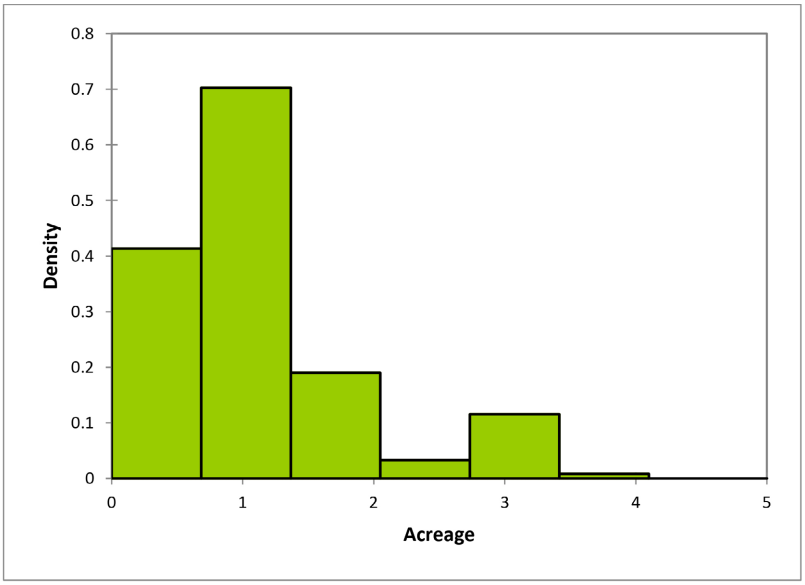

Figure 3. Average land area (ha) per household.

Traditional farming relies on hoes and machetes. The African mosaic virus has considerably affected cassava. The fields are mainly worked by family labor, and sometimes by day laborers, at all stages. Labor costs are approximately $0.62 per man-day. Some payments are made in kind from the harvest. Farming is often done by older people, while younger people take care of activities considered more income-generating, such as small business. As a result, many young heads of households have moved to the mining sites as diggers or street merchants who

travel long distances with their loads. In the region, cassava predominates among agricultural crops, despite the presence of the virus, followed by vegetables, sweet potatoes, bananas, maize, sorghum, and, lastly, yams.

Generally, in the mountainous South Kivu region, the perceived main constraints are low producer prices, inadequate feeder roads, insufficient producer cooperatives, excessive taxes, transport difficulties, competition from imports, and lack of information among producers. In the more fertile lowlands, market saturation adds to these constraints in a context in which agricultural production is relatively higher, with no processing technology. At higher altitudes, hens predominate among livestock species, followed in descending order by goats, rabbits, pigs, guinea pigs, cows, sheep, and ducks. In the lowlands, we find goats, hens, pigs, cows, rabbits, sheep, and ducks.

The main breeding themes are chickens, goats, and guinea pigs. Cows, pigs, rabbits, and ducks play a secondary role. Sheep are becoming increasingly rare. Sheep are kept loose, which encourages the spread of disease and the destruction of crops, causing intense quarrels between breeders and farmers. Veterinary care is virtually non-existent. The main constraints on livestock management are the lack of pasture, rambling animals, and the absence of appropriate breeding techniques. As for livestock marketing, households must contend with high mortality, unfair competition from importers, prices imposed by customers, and difficulties in transporting livestock to market.

Both livestock breeding and agriculture are faced with dwindling land (fields and pastures) in the face of demographic growth within traditions that divide the land to the benefit of male descendants with no alternative at each episode of inheritance. Rudimentary technologies and limited capital have prevented any intensification (selection of breeds and varieties, inputs, agro-veterinary chemicals, and access to techniques). Attempts to encourage people to move to low-density lowlands have failed because of cultural differences and the hot, malaria-prone climate. The main perceived difficulties in accessing land are, above all, land scarcity, the high number of children in households, high land prices, and the selfishness of land grabbers. Land conflicts are those linked to inheritance, with the eldest heirs monopolizing the land and forgetting the other co-heirs. There are also boundary conflicts and those linked to the leasing of fields. Land grabbers are often wealthy urban elites who buy scarce land at high prices, or land that is expropriated through land contracts negotiated far beyond the reach of communities.

Transport poses a serious problem for the agricultural sector in particular and for development in general. The transport of crops to commercial centers is arduous, usually done on the backs of women in a region where horses and donkeys are unknown. Farmers are often faced with imposed low prices. The long distances mean that unsold produce cannot be returned home, where storage conditions are not guaranteed. Land purchase would be a panacea in this context of land depletion. Those selling the land are customary chiefs who are in the process of depleting community lands, as well as decadent planters and households who

have made some fortune in distant artisanal minerals, lured by cities or commercial centers.

4.2. Home Comfort and Equipment

In rural areas, traditional dwellings (thatched mud house and hut) score 32% in the two types of rural regions studied, and 20% in suburbs. Semi-permanent houses are predominant (46%), compared to 22% for brick houses. However, in suburbs, semi-permanent houses scored 43%, followed by brick houses (28%), versus 20% for traditional houses. The suburban environment has achieved some improvements compared to traditional house types, while sacrificing comfort in the cramped conditions of tiny spaces. In landlocked villages, living conditions are more difficult. In some isolated locations, over 80% of the houses are still traditional.

Household waste is composted and used to fertilize the fields. Household toilets are of the traditional type, i.e., a pit dug and topped by floors in precarious shelters. Traditional housing is 74% linked to the acreage and the frequency of children eating at neighboring homes. Traditional accommodation represents a very important indicator of poverty in terms of the paucity of land capital and in terms of food insecurity in the household, to such an extent that children eat at the homes of neighbors who reluctantly take them in. There is also a high correlation between traditional dwellings and widowhood rates, cash assistance from relatives, and debts. The type of dwelling significantly influences electrical installations, the number of daughters attending school, the distance to school, acreage, distance to the farmland, and the number of cows per household. The number of guinea pigs was significantly lower in households with permanent houses than in those with traditional and semi-permanent houses; however, the number of cows was significantly higher in semi-permanent houses than in the other categories. On the other hand, households living in huts have significantly fewer cows than those in the other two categories. The distance to the fields was also significantly lower in households with permanent houses. Those with permanent houses have fields closer together than those living in traditional dwellings whose fields are scattered. The fear of land grabbing is also significantly higher among households living in huts (60%) than among those living in permanent houses (28%). The proportion of households who feel more land vulnerable is still considerable (43%) among those occupying semi-permanent houses. However, land conflicts are intensively perceived regardless of housing type (≈92%). The membership of local development associations does not vary significantly with house type. Polygamy rates and association membership did not vary significantly with house type.

In contrast, a permanent house is strongly correlated with business activity, ownership of amenities such as TVs and telephones, satisfaction with medical care, fewer months without food, and school-age children attending school. The semi-permanent house statistically represents an intermediate situation between the sustainable and traditional houses. The main indicators of well-being are the

acreage of the farmland, the size of the livestock, the quantity and duration of the hunger season, and the type of household house. Typically, one radio is mentioned per household; two cell phones compared with three in suburbs. Two braziers are mentioned for each household. The main source of energy in these environments is firewood. It is mainly used for cooking but also for baking bricks. Many people use torches and kerosene lamps for lighting. Very few households have access to electricity. The few households connected to the national grid only receive power 1 - 2 days a week. A few wealthier households use generators and solar panels.

4.3. The Influence of Rural Commercial Centers

Rural commercial centers have grown, albeit slowly. Very few of these centers have sufficiently developed into small towns with an urban core. Around mining centers and rare airdromes, poorly structured boom towns have sprung up, barely recognized as such by the authorities. Little investment occurred there, and almost all the capital generated was drained to the few old colonial-era towns. The wealth generated in these centers encouraged abandonment via poorly managed rural exodus, as well as promiscuity, debauchery, and the proletariat.

Commercial centers as a route to rural urbanization positively influenced distance to health post, distance to school, occurrence of electrical facilities, frequency of households with at least one starving child ($Chi^2 = 11.91$, $p < 0.001$; 26% in commercial centers vs. 61% in scattered villages), as well as the number of guinea pigs per household. However, total acreage was significantly smaller among households living in commercial centers. This is probably because they have turned to non-agricultural activities. We also note that commercial centers had no significant influence on family size, girls' school enrollment, membership of local development associations, reasons for non-attendance at health centers, and the predominant diseases; and the frequency of land conflicts was similar in both types of environments (>90%).

4.4. Food Self-Sufficiency

Agricultural production has deteriorated to such an extent that households in infertile rural Divisions buy almost as much food as those living in suburbs. Food self-sufficiency is approximately three times higher in fertile regions in terms of the length of the hunger season. The number of months of the hunger season is so high that it represents half the year in highland Divisions and even reaches 7.5 months in suburbs.

Food stocks last for an average of 3 - 4.5 months. In 95% of households, they last between 2.5 and 6.5 months (**Figure 4**). Therefore, there is a long lean period of 7 months. Ninety-eight percent of households recognized a food shortage. During the lean period, women intensified their small-scale trade of cassava, beans, and other food products from Goma, Bukavu, and Rwanda, reselling them in retail under the yoke of taxes that considerably increase consumer costs. Producer prices are also low. The duration of food stocks is directly correlated with the score

for land acquisition by purchase and with the score for reduced meal frequency and the cash donation score. The number of meals per day in households fluctuates from 1 to 3 (modal value 2), mainly depending on the availability of beans and cassava, and the coffee harvest in the few producing areas.

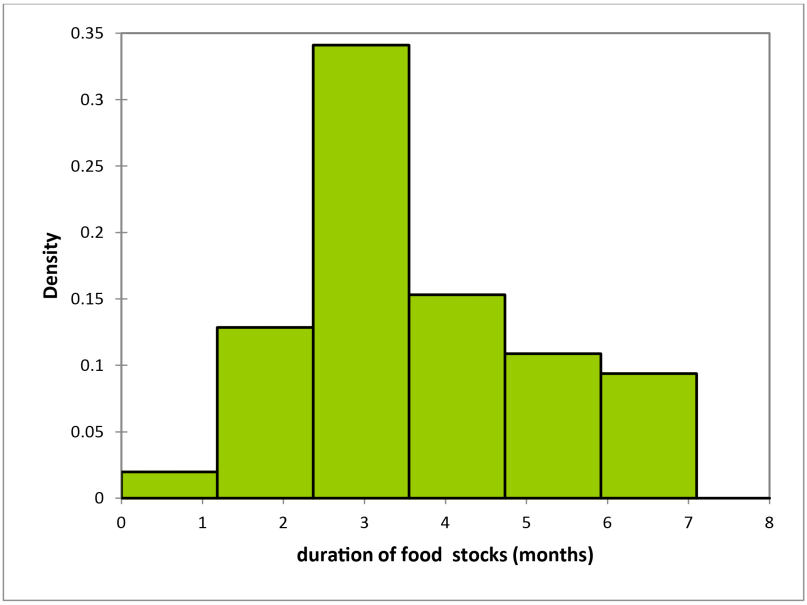

Figure 4. Duration of household food stocks.

Regarding factors contributing to household food insufficiency, land size appears to be a significant determinant ($p = 0.047$). Younger households with more children under 15—own relatively less land ($p = 0.003$). Among the factors influencing the occurrence of malnutrition in households, family size, acreage, and membership of associations as a source of support play a significant role. Household heads perceive seasonal rainfall variability, lack of means of production, rudimentary technologies, and large family size as factors contributing to food insufficiency. Soil infertility is very noticeable, as is climatic disturbance. Erosion, flooding, and other natural disasters are also mentioned.

Resilience in the face of food insufficiency is based on reducing the frequency or quantity of meals consumed, as well as resorting to credit; older people leaving food to younger ones; selling household goods; sending children to occasionally eat at neighbors' houses; and adopting unusual foods.

Survival strategies in times of food shortage include, in increasing order: purchasing food, selling agricultural produce, giving food away, reducing the frequency of meals, reducing the quantity of food, giving away money, small trade, selling livestock, casual labor, older people leaving food for younger ones, selling household goods, and children eating at neighbors' houses (Figure 5).

In the suburbs, we observe: the purchase of food, the donation of food, the reduction in the quantity of food, the reduction in the frequency of meals, small trade, debts/financial aid, casual labor, the sale of agricultural produce, the elderly

leaving food to the younger, the sale of household goods, the sale of livestock, and children occasionally going to eat at the neighbors'.

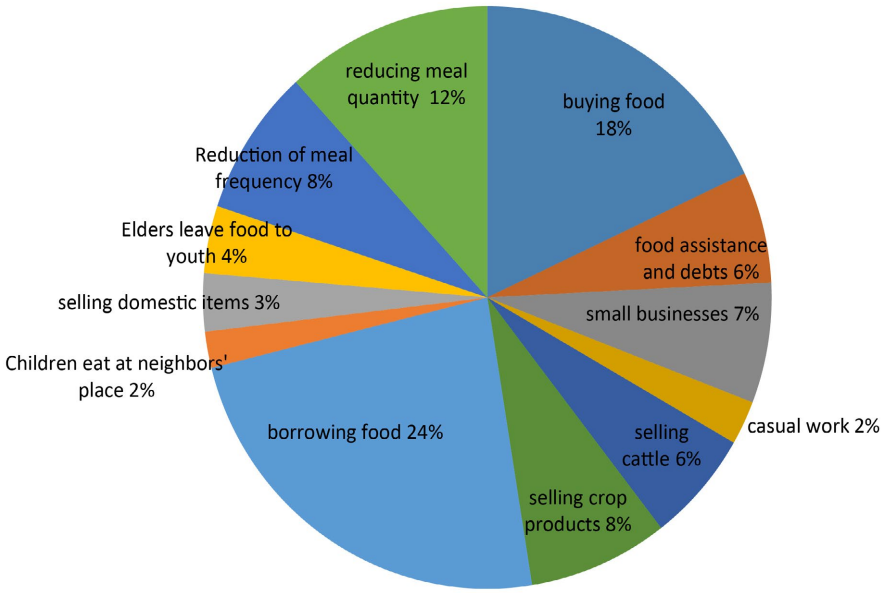

Figure 5. Coping strategies despite food insecurity.

While food loans dominate strategies in more productive environments, where food products are available in relative abundance, in deficient environments, it will be necessary to buy more, especially in high-altitude environments. However, everyone will also reduce the amount they consume.

4.5. The Environmental Status and Access to Services

Deforestation

In this study, deforestation is perceived here as the main environmental problem, followed by soil infertility. Soil infertility is significantly correlated with a wide range of parameters: area of farmland, prices imposed on producers, lack of agricultural feeder roads, burden of taxes, dependence on purchased food, and high health care costs. They also represent a powerful factor with multiple adverse effects. In addition to poor housing, soil infertility is a real burden. The erosion caused by deforestation and flooding is also obvious.

Access to health services and drinking water

The nearest distance to the health post typically varies from 900 m to 1.1 km in rural areas and is only around 500 m in suburbs. This distance is often greater in land-locked areas. In recent years, small to medium-sized health centers have proliferated as a source of income for their owners in these disease-prone areas. Patients travel long distances to reach healthcare centers or hospitals, and satisfaction with the quality of care is very limited. Healthcare staff are not highly specialized, and the quality of medicines remains unsatisfactory. Counterfeit drugs and expired medicines represent a serious threat to health. Serious cases are trans-

ferred to distant hospitals. Many health centers lack sanitary facilities (taps, toilets, showers, etc.). There are often 2 patients per bed, and some are on the floor during epidemics.

The cost of healthcare is very high in relation to the population's purchasing power, with an average of $30 per patient per consultation episode. Several cases of patients dying on their way to health centers have been reported. The high cost of care is the main factor limiting hospital attendance. Attendance at these health posts is 70% - 80%. The high cost of healthcare is more noticeable in fertile zones. In Buzi-Bulenga, the hospital is located near the boundary with Masisi District, and many users must hire motorcycles to reach it. In addition, inhabitants of the Kalehe high plateaux have to travel long distances by motorcycle on a road in poor condition to reach the Minova referral hospital.

This high cost is perceived similarly in highlands as in suburbs. Dissatisfaction with and non-attendance at health services are approximately 45% in highlands, 55% in the more fertile lowlands, and only 27% in suburbs, where access to services is more available. The most common illnesses are malaria, typhoid fever, diarrhea, respiratory diseases, stomach ache, marasmus, cholera, and diabetes. Malaria is the most common health issue in households (41% - 46% in rural areas and 38% in suburbs). Malaria is followed by typhoid fever (22%). Diarrhea is particularly prevalent among children (15% - 17%). Stomach ache is also common among adults (12% - 15%). Rheumatism affects adults (3% - 8%) in this rather cold montane climate (1500 - 2500 m).

Bilharzia is also mentioned in some lakeshore areas. In landlocked areas, NGOs have carried out several water adduction and spring development projects over the past two decades, but much remains to be done. Drinking water sources are often far away, beyond 2 km.

Access to education

The population is dominated by school-age children (54%), whether in highland sectors (57.9%), in more fertile lowlands (55.3%), or in suburbs (40.5%). Of these school-age children, approximately 68% are enrolled in the poorest highland sectors, compared with 80% in the most fertile lowlands and 68.9% in suburbs. The greatest constraint on access to education is the difficulty of paying school fees. The number of good-quality and poor-quality schools has increased significantly in recent years. However, since the 90s, school fees paid by parents have been a constraint. These fees are higher near towns ($5 per month per pupil in rural areas) for a household that has to pay for 6 children per household.

Many schools have wooden walls, except for some Catholic schools that are built with permanent materials. Some teachers are low-skilled, and many others are unpaid. Those who are paid receive a monthly wage of $40. Their frequent lack of skills in remote areas is linked to incomplete studies, shortages of libraries and educational materials, and the absence of school canteens. Children drop out mainly because of the long distances between school and home. The advanced age of some pupils and the arduous nature of parental responsibilities for education

are noted. Satisfaction with education remains low. With limited resources, some households send more boys than girls to school in remote areas. As a result, school enrollment rates are as low as 42% for girls and 52% for boys of school age. Access to school is more difficult for girls than for boys from secondary school upwards. In addition to family choice, pregnancy and early marriage are the main reasons why many girls drop out of school.

4.6. Membership of Local Development Associations

The membership of development associations is 40% in the lowlands, compared with only 29% in suburbs. In the landlocked highlands, the need to join local development initiatives is greater to cope with the lack of agricultural supervision and protection against various rights violations. In the highlands, 42% of households belong to mutual associations, compared with 39% in suburbs. The membership of mutual associations is relatively minimal in the more fertile lowland sectors (30%).

The membership of health mutual associations is significantly lower than that of other types of association (20% in highlands, 31% in more fertile lowlands, and 15% in suburbs). Health mutual associations are relatively recent, and low incomes enhance the impression that membership fees are high in relation to services rendered. Cheating can even be seen when mutual health insurance members bring in cards without photos to serve a non-subscribing extended family member. This complicates the effectiveness of the health mutual associations, which are nonetheless making good progress. Development associations are seen as holding up well overall, with only 17% - 21% judging them to have deteriorated.

There is a lower level of membership for village organizations in shopping centers than in isolated villages. The relatively modernized inhabitants of commercial centers believe that development cannot come from the community, but rather from the private sector. In the nomenclature of associations, we found breeders' associations, solidarity mutual associations, village development committees, village development associations, and, less frequently, health mutual associations, women's promotion groups (2%), and producers' cooperatives.

4.7. Land Access Modes

Figure 6 illustrates the land access modes. Inheritance was the main mode of access to land in the three environments (56%), followed by land purchase (24%) and rental (20%).

Land-related conflicts are frequent as land becomes scarcer. They are perceived by 53% of households in the less fertile uplands and by 57% in suburbs where land is even more expensive and scarce; these conflicts are exacerbated in regions deemed fertile (68%). Inheritance conflicts account for 31% - 34% of cases, whereas rental conflicts between tenants and landlords or among tenants account for 16% - 20% of cases. The materialization of boundaries causes many conflicts in lowlands (42%) and 29% - 32% in uplands and suburbs. These conflicts have

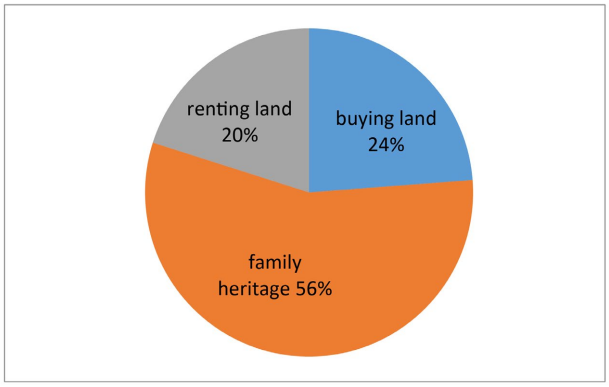

Figure 6. Dominant modes of land access.

been resolved to some extent by local authorities and development associations. As local authority is limited by weak decentralization, non-executed court rulings are commonplace, to the benefit of the strongest. The cost of land has become very speculative, due to high demand and liberalism to the benefit of the wealthiest.

4.8. Geographic Disparities between the Different Administrative Divisions

Figure 7, **Figure 8** indicate the geographic disparities. The study environments are clustered into 4 groups, distinguishing Buzi-Bulenga, Kamanyola, and Kavimvira suburb in Uvira. All of the remnants constitute a 4th cluster that includes MosalaKasha suburbs around Bukavu and the other rural Divisions (Nyakalengwa on Idjwi Island and 9 highland Divisions in the Bushi cultural region, namely Bugorhe, Bushumba, Cirunga, Mumosho, Kamisimbi, Nyangezi, Ikoma, Kagabi, and Mudaka). Although Mudaka and Bugorhe have volcanic soils, the area cultivated per household has become too small to ensure good production.

4.9. Some Illustrative Cases

Kavimvira, a medium-sized suburban estate in the city of Uvira, has an estimated 23% of all electricity and drinking water subscribers. Polygamists account for 26% of heads of households, whereas 4% are divorced. Among sources of income, commerce had a score of 35%, salaried work (15%), agriculture (19%), fishing (8%), and self-employment or unemployment (2%). The distance to the nearest health center is no more than a 30-minute walk for 89% of households, with an attendance rate of 93%. Malaria, typhoid fever, and diarrhea are endemic. The distance to school is approximately a 30-minute walk for 54% of the population. Television is available in at least 31% of households, bicycles in 30%, and motorcycles, a very popular taxi, are found in a considerable number of households. Cars are found in some households, and refrigerators are found in 9%, while 37% of households own the house they live in. In 16% of cases, there are semi-permanent houses and 81% permanent dwellings, but a few traditional huts are found in a minority (3%) of households. People mostly eat rice, beans, and cassava flour, with 1 - 2 meals a day. Lack of money and family size are two constraints.

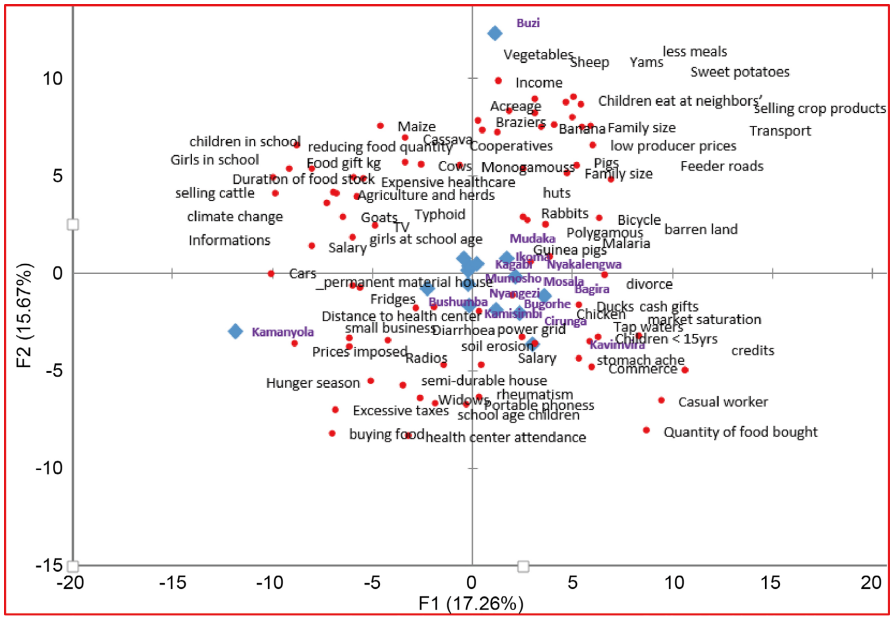

Figure 7. Geographic disparities between administrative Divisions: Cluster a = highland Divisions with infertile soils; Cluster b = lowland Divisions with fertile soils (Kamanyola and Buzi-Bulenga); and Cluster c = suburbs. 1 = afforestation and attendance to health services; 2 = rates of divorce and number of cell phones; 3 = use of maize and intensity of casual labor.

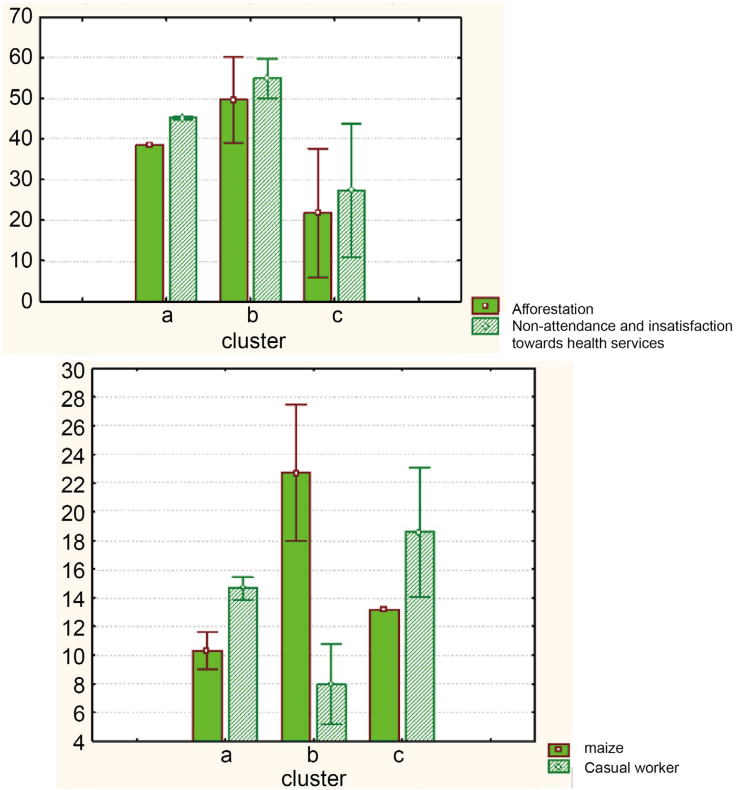

Figure 8. Geographic disparities between administrative divisions: Cluster a = highland divisions with barren soils; Cluster b = lowland divisions with fertile soils (Kamanyola and Buzi-Bulenga); Cluster c = sub-urbs.

In Buzi-Bulenga, a division on the border with Masisi District in North Kivu, the average family size is 9, with 95% of households comprising between 6 and 12 people. Among sources of income, agriculture accounts for at least 50%, livestock rearing 17%, trade 10%, wages 7%, handicrafts 3%, and day labor by landless peasants (13%). The distance to the health center is approximately 0.5 km (0.5 ± 0.44 km); but in the most landlocked localities, this distance exceeds 12 km. In these isolated villages, the market is more than 10 km away. Typhoid (48%), diarrhea (27%), rheumatism in this somewhat cold climate (17%), and respiratory diseases (8%) are the major health issues. The school dropout rate for girls was approximately 95%.

Among the main constraints to development, soil infertility is perceived by 35% of households, as opposed to 50% for climatic disturbances; erosion and landslides (15%). Among the causes of food insecurity, unstable rainfall is perceived by 7% of households, as opposed to 10% who blame the family being too large, as is the case in the urban district of Kavimvira. However, from this point of view, the weakness of the means of production (55%) predominates among these causes. Livestock farming suffers from a lack of pastures (73%), veterinary products, and stables (27%). Access to land is mainly granted through inheritance (59%), purchase (21%), and rental (16%). In rare cases, households benefit from land allocated by village chiefs (4%). The distance to the field varied widely (47 ± 37.5 minutes' walk).

Regarding land access, the main constraints are land scarcity (50%), high cost (22%), and occupation by large landowners (20%). Land conflicts are recurrent (92%). In terms of housing, 17% are permanent, 36% are semi-permanent in Buzi-Bulenga, and 47% are traditional (thatched huts). The average monthly income is US$64 ± 47, with 95% of households earning between US$27 and 111 per month (min $18; max $180). The family landholding average is around 2 ha ± 1.53. Tenants pay US$100/ha/year or share the harvest with the tenant. The lean season lasts 3 - 7 months (average 5 months), with food stocks lasting 3 months ± 1.02. The main sources of income in Buzi are the sale of agricultural produce (50%), the sale of livestock (17%), small trade (13%), salaries (7%), and casual labor (13%) performed by the poorest landless people. Buzi's rural associations are active in agriculture (39%), savings and mutual associations (46%), and education/training/literacy (15%).

Among Bushi highland Divisions, i.e., Ikoma, Izege, and Walungu, pooled together, the polygamy rate is 18%. The average distance to the health center was 0.5 km (0.5 ± 0.44 km). Agriculture (50%) is the main source of income, followed by livestock breeding (27%) and small trade (13%). Wages rate is minimal (7%), with a small amount of handicraft (3%). Casual labor accounts for 10%. Attendance at healthcare centers is very low (39%) due to the high cost of care and distance. The school enrollment rate for girls (60%) is lower than the overall rate of 65%. The average distance to the nearest school is 1.5 ± 0.54 km.

Constraints for access to land include high cost and scarcity. Many households

explain their food insecurity primarily by the lack of means of production (55%; land or cash) and family size (10%). Rainfall is a problem in 7% of the cases despite annual rainfall records of ca. 1200 mm, which are sometimes unbalanced. The distance to the farming field is around 22 minutes ± 15.8. Land disputes are recurrent (92%) followed by boundary disputes (60%), inheritance disputes (27%), and land rental disputes (11%). Access to land is by inheritance (55%) or purchase (38%), with a minor role played by chiefs (7%). Farming fields are often tiny and scattered (1 - 8; mean 2 ± 1.53).

The Buzi-Bulenga Division is strongly marked by the production of sweet potatoes, cassava, maize, bananas, vegetables (market garden crops), yams, and maize. Livestock production is dominated by cows and some sheep. The disparity between incomes is very high, as is the relative ease of transport due to the national road to Goma. Several intermediaries buy their supplies at the Minova trading center. The incidence of land conflicts is high, particularly in the form of field boundary disputes. Low producer prices are perceived by local residents as a problem. There is also a lack of information about technology and the market. This disparity in income means that some households are so vulnerable that they reduce the number of meals they eat as a survival strategy. It is also a host area for displaced people fleeing conflict in the surrounding Masisi region.

The Kamanyola Division is characterized by small trade and livestock sales as sources of significant income. There is a strong perception of deforestation and prices imposed by middlemen, as well as high healthcare costs. A few years ago, families were displaced by famine due to drought in this arid environment, where even on average, rainfall is low; climatic disruption is strongly perceived. Membership in mutual health insurance schemes is fairly high. Producer taxes are considered exorbitant. The sale of household goods and food dependency could characterize the drought period, during which adults sometimes left food to their children. Typhoid fever is a major issue in this area. The variables discriminating the 4 clusters, i.e., the infertile highlands, the 2 more fertile lowlands of Kamanyola and Buzi-Bulenga, and the suburbs, are respectively: divorce rates, the degree of maize adoption vs cassava, the number of cell phones per household, the frequency of casual labor, the perception of deforestation, and rates of health service attendance/satisfaction. Divorce is clearly more of a suburban/urban phenomenon than a rural one. Suburban families also have more cell phones per household (2 - 4) than the other two rural classes. Perception of deforestation is significantly higher in the Buzi-Bulenga area and Kamanyola, where non-attendance/dissatisfaction with health services is also much higher. These above lands' two scores are higher in the highlands Bushi areas as opposed to suburban areas, where perceptions of deforestation and satisfaction with health services are inconsistent. Maize production is higher in Kamanyola and Buzi-Bulenga. In contrast to Buzi-Bulenga, local day laborers are noticeable in Kamanyola, where casual labor is imported from bordering Rwandan villages. Maize is grown less frequently in the highland villages of Bushi, where it is a minority crop in marshland fields and

contributes very little to the food supply. The use of casual labor in the Bushi highlands is minimal on smaller farmland of low commercial value.

An illustration of the case of the spontaneous settlements of the suburban lumpenproletariat, the landing points of rural exodus flows during the recurrent wars in Eastern DRC, is given by the spontaneous settlements of Kasha, around the city of Bukavu, around Lake Kivu. Average family size is 7.0 ± 3.17 (min 3; max 15). The head of household is typically 40 ± 10.20 years old. Households mainly live from small trade (49%) or from burden-bearers or domestic work (13%) or salaried work in town (28%); handicrafts account for 10%. Households have access to 2 meals (45%) a day or a single meal (33%), although 22% of households live on an unpredictable or irregular meal regime (which takes place or not at all). In any case, only 10% of households recognized meals as sufficient and balanced.

They bought land on this recently occupied estate (92%), where they experience many boundary disputes (63%), erosion (53%), and landslides (47%). The school enrollment rate is approximately 77%. Electricity is available to 10% of households. They live in semi-permanent houses (75%), thatched huts (25%), and by no means in permanent houses, which would weigh too heavily on their slippery slopes. They often own houses (65%) rather than rent.

5. Discussion

5.1. Rurality vs Commercial Centers and Suburbs

Although our results on suburban areas do not show much difference as opposed to rural ones, large-scale migration from rural areas to urban centers depletes the rural workforce and hinders local economic development (Yar & Noori, 2024; Yar & Zazia, 2024). However, a study in Pakistan shows that migration to urban areas often leads to increased income and improved employment opportunities, particularly for those with higher education levels (Ali et al., 2015).

Commercial centers provide access to goods and services not readily available in rural areas, improving living standards (Ebrahimzadeh et al., 2012; Gyawali, 2022; Withanage, 2018). The study on planned small townships in Sri Lanka emphasizes their role as service centers for surrounding regions (Withanage, 2018). Studies on China's rural revitalization and the impact of the digital economy highlight the importance of agglomeration economies and spatial spillover effects in promoting rural development, but also acknowledge the challenges of regional disparities (Wei et al., 2025). Successful commercial centers can attract further investment in rural areas (Kulshreshtha, 2020). However, over-reliance on a commercial center can make rural areas vulnerable to economic shocks (Kulshreshtha, 2020). Several papers highlight the potential for commercial centers to create jobs in rural areas, either directly through employment in the centers or indirectly through supporting industries. The development of commercial vegetable farming supported by social media in Bharatpur, Nepal, is a prime example of this

(Gyawali, 2022). Similarly, the development of small towns in Iran, such as Zahedshahr, demonstrates their role in providing services and markets for surrounding rural areas (Ebrahimzadeh et al., 2012). The success of these initiatives, however, is dependent on factors like access to information (social media in the Nepal case) and existing infrastructure. The functional analysis of Zahedshahr, Iran, highlights the significant economic role small towns play in serving their rural peripheries, acting as centers for agricultural product sales and service provision (Ebrahimzadeh et al., 2012). Successful commercial centers can attract further investment in rural areas (Kulshreshtha, 2020).

Good health and access to quality healthcare are essential for a productive workforce and improved quality of life (Singh, 2025; Uprety, 2025; Moskvicheva et al., 2025). Addressing social determinants of health, such as poverty, inequality, and access to resources, is crucial (Backonja et al., 2022; Shrestha et al., 2023; Uprety, 2025). Unequal access to healthcare services, including maternal and child health, significantly impacts human capital and development (Helmeczi, 2024; Saeed et al., 2025; Sehgal et al., 2024; Suparmi et al., 2018). In our study, the most landlocked cluster is the Bushi highland. Alkire et al. (2014) illustrated that 85% of the world's poor live in rural areas. They noted that of the 1.3 billion people living on less than $1.25, 71.6% live in rural areas. This proportion rises to 75% in sub-Saharan Africa and 80.7% in South Asia, compared with 26.5% in Latin America and the Caribbean. In the same vein, ANSD Sénégal (2015) analyzed household poverty and living conditions in Senegal. They found high subjective poverty such that more than half of households (56.5%) consider themselves poor, among which 45.7% declare themselves very poor. They found that poverty is very marked in rural areas, where more than 2/3 of households declared themselves poor (69% vs. 38.2% in urban Dakar), of which 53.2% vs. 24.7% in urban areas saw themselves as very poor. Rural areas remain the concentration of poverty and extreme poverty.

However, Braun & McComb (1993) argued that for a majority of countries, not only have the absolute numbers of urban poor and malnourished increased over the last 15 - 20 years, but they have done so at a rate that exceeds the corresponding change in rural areas. In this vein, they suggested that gaps between rural and urban living standards are decreasing as urban inequalities increase. In 5 of the 24 countries studied by these authors, infant mortality rates are higher in urban areas: Benin, Burundi, Chad, Rwanda, and Zambia. As for enrolments in general, the proportion of girls/boys enrolled is higher in urban areas.

5.2. Geographical Disparities

The Buzi-Bulenga and Kamanyola Divisions are very distinct from the others, but stand apart from the rest. The main variables differentiating the 3 types of environment, i.e., the infertile Bushi highlands, the more fertile lowlands of Kamanyola and Buzi-Bulenga, and the suburban areas, are respectively: divorce rates, the degree of maize adoption, the number of cell phones per household, the frequency

of casual labor, the perception of deforestation, and the rates of attendance/satisfaction with health services (Figure 9).

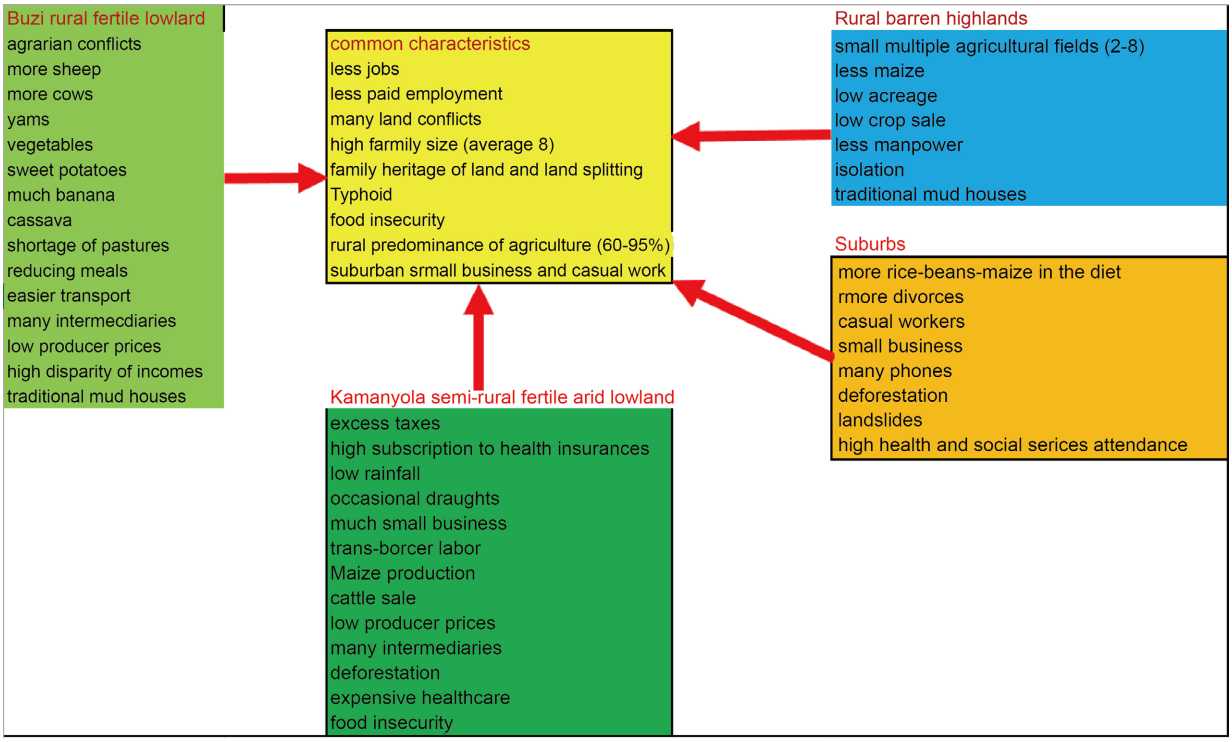

Figure 9. The geographic disparities.

Environmental degradation, including land degradation and water scarcity, threatens agricultural productivity and livelihoods in rural areas (Maksimovic et al., 2018; Muzekenyi et al., 2023; Nguyen et al., 2025; Yar & Zazia, 2024) Low agricultural productivity limits income generation and food security in rural areas. This can be due to a variety of factors, including lack of access to technology, inputs, and markets (Muzekenyi et al., 2023). Implementing sustainable practices for managing land, water, and forests can ensure the long-term viability of rural economies and ecosystems (Cattaneo et al., 2021; Muhardi et al., 2020; Mihai et al., 2021). Significant income disparities between households and communities lead to unequal access to resources and opportunities (Jawairia et al., 2024; Muhtar et al., 2024; Putra et al., 2020; Qutieshat & Al-Assaf, 2024; Salvati et al., 2017; Sarkar, 2013).

Disparities in education levels significantly impact economic opportunities and social mobility. Lower literacy rates and reduced access to higher education, particularly for women in rural areas, hinder development (Ansary, 2017; Chang et al., 2024; Mahali & Bhattacharyya, 2025; Phayayam et al., 2024; Saeed et al., 2025; Li et al., 2013). The study on China specifically points out a larger gender gap in educational attainment in non-rural areas compared to rural areas (Chang et al., 2024).

Geographical factors, such as remoteness, landlockedness, and topography, can

significantly impact access to markets and services (Saeed et al., 2025; Voronov, 2022; Li et al., 2013; Zhang et al., 2020). Unequal access to healthcare services, including maternal and child health, significantly impacts human capital and development (Helmeczi, 2024; Saeed et al., 2025; Sehgal et al., 2024; Suparmi et al., 2018). The increased distance and reliance on transit routes lead to higher transportation costs for both imports and exports. This makes rural products less competitive in international and even domestic markets, reducing the profitability of agricultural activities and hindering rural development. The impact of transportation costs on economic growth in Nigeria is explicitly discussed in one paper (Afaha & Agbaje, 2020).

Divorce is more of a suburban phenomenon than a rural one. Suburban families also have more cell phones per household. Divorce rates diminish in rural areas where customs discourage court cases about divorces and even really separated couples cling together on their farm and take care of their numerous children. Despite the nutritional value of maize, the rural communities maintain nutritionally poor cassava as a staple food, mainly by habit despite its low yield in highlands and low nutrient value. People usually forget that it is not the ancestral food and that it was imposed by colonial power just before the First World War to feed the Congolese troops and mine workers. In addition, no casual labor is expected on tiny farmlands < 0.5 ha. Anyway, high unemployment rates, high family size, family heritage of land and its subsequent land-splitting prevail, and life standards are low everywhere within all of the clusters. Despite sufficient rainfall (about 1200 mm), poor crop choices and infertile soils keep the Bushi highland in substandard conditions. In the endeavor of reducing the above disparities, investing in roads, communication networks (internet access), and other infrastructure is essential for connecting rural areas to markets and services (Cattaneo et al., 2021; Edirin, 2018; Ahmed & Eklund; 2019, Rönkkö et al., 2017; Rashid et al., 2023). This facilitates access to education, healthcare, and other essential services. There are significant challenges in accessing quality education in rural areas, particularly for girls and women (Ali et al., 2021; Bao et al., 2022; Habib et al., 2024; Kumar & Khunger, 2025; Kumari, 2024; Miao et al., 2023; Shoukat et al., 2025; Wang, 2021; Wood et al., 2021; Wu, 2024; Xu et al., 2022; Zhang et al., 2020). These challenges include geographical barriers, financial constraints, cultural norms, and gender biases.

Expanding access to markets and financial services is crucial for enabling rural communities to participate in the economy. This includes providing access to credit, insurance, and other financial products (Yar & Zazia, 2024; Yar & Zazia, 2024; Aleke, 2024). Lack of adequate infrastructure, including roads, transportation networks, communication systems, and access to clean water and sanitation, hinders economic activity and access to essential services. (Aleksandrov & Fedorova, 2020; Gowdhaman et al., 2024; Hidayat et al., 2019; Muzekenyi et al., 2023; Okosun et al., 2023; Okpa, 2022; Stanovcic et al., 2018: pp. 107-117; Yar & Zazia, 2024).

5.3. Gender and the Struggle for Life

Women's struggle against poverty is clearly visible in our results, whether in agriculture or small-scale trading. In particular, during the lean season, women intensify small trade in cassava, beans, and other foodstuffs from Goma, Bukavu, and Rwanda, reselling them at retail. The main findings of Gniza (2021) suggest that, in Burkina Faso, women farm managers are clearly disadvantaged with regard to most of the factors that contribute to agricultural productivity, such as the quality of the land farmed and the use or intensity of inputs. The analysis reveals that farmland managed by women is, on average, 26% less productive than that of their male counterparts. In the same vein, FAO (2011) goes into great detail when it states that, in many developing countries, the agricultural sector is underperforming, partly because women do not have access to the same resources and opportunities as men to increase production. There is a wide gap between men and women in terms of access to productive resources. Women control less land than men, and their land is often of poorer quality and subject to more unstable tenure. In addition, women own fewer draught animals, which are necessary for cultivating the fields. According to well-established empirical data, women could achieve the same yields as men if they could use the same resources on the land they cultivate. In fact, our results show that the school enrolment rate for girls is lower than that of their male counterparts. This gap in education will lead to inequalities in access to skilled wage labor. Promoting gender equality is essential for empowering women and ensuring their full participation in rural development. This includes providing women with access to education, resources, and opportunities (Dube et al., 2025; Kour & Yadav, 2024). Research in Ghana highlights the importance of education and training for rural women's income-generating activities (Asantewa, 2024). The paper on women's empowerment in India (Dube et al., 2025) highlights the role of Self-Help Groups (SHGs) in fostering social cohesion and enabling women to engage in income-generating activities. In our study area, the plough and the donkey, the horse are unknown; only hoes are used. Introducing new technologies in agriculture can improve productivity and efficiency (Yu et al., 2024). Obviously, ecotourism is ignored in our study area. Combining agriculture with tourism can generate income and employment opportunities, particularly in areas with attractive natural landscapes or cultural heritage (Togaymurodov et al., 2023; Demková et al., 2022). Sustainable biofuel production can create new income streams for rural communities and contribute to energy security (Sheelanere & Kulshreshtha, 2013). Investing in renewable energy sources (solar, wind, biogas) can improve energy access and reduce reliance on fossil fuels (Cheng et al., 2017; Udoka et al., 2024). Developing strategies for adapting to the impacts of climate change is crucial for building resilience in rural communities (Banzhaf et al., 2022; Mensah & FitzGibbon, 2012). Although traditional practices and beliefs can sometimes conflict with modern development initiatives, leading to resistance to change and hindering the adoption of new technologies or approaches (Kapsalis, 2023; Mosweunyane, 2024). Harmful traditional practices,

such as child marriage and gender-based violence, can hinder development (Barini et al., 2024).

5.4. Sources of Income

Our results show that in the infertile rural Bushi highlands, agriculture is the main source of income, followed by livestock rearing and small trade. Wage labour is minimal, with a small amount of handicraft. Casual labor accounts for 10%. Attendance at health centers is very low due to the high cost of care and distance. The average distance to the nearest school is 1.5 ± 0.54 km. In rural Mali, 94% of households are involved in agricultural activity. However, only 19% of urban households are self-employed in agricultural activities, and these are mainly livestock breeders. Only in Bamako do the majority of these households (46%) derive their income from non-agricultural wages. This difference is due to the urban nature of Bamako households, who practice agriculture as a secondary activity (Gebreegziabher & Kooten, 2019). Twenty or thirty years ago, it was thought that most poor rural families earned their living from farming. Then studies showed that off-farm income, such as wage labor, handicrafts, micro-trading, or money sent home by expatriate relatives, was far more important than income from farm activities. This generated a new vision of rural poverty. High levels of poverty and unemployment are major obstacles to rural development, limiting access to resources, education, and healthcare (Muzekenyi et al., 2023; Nadim & Nurlukman, 2018; Yar & Zazia, 2024).

5.5. Living Conditions, Accommodation, Transport, and Comfort

Our results show that housing is typically indecent and infrastructure is in poor condition. Housing types significantly influence electrical installations and the number of girls attending school; distance to school, land area per household, distance to the field, and the number of cows per household. In fact, the cow is a great sign of rural prosperity here. Fear of land grabbing is significantly higher among households living in huts than among those living in permanent housing.

The number of meals per day in households fluctuates from 1 to 3 (modal value 2), depending mainly on the availability of beans and cassava and the coffee harvest in the few producing areas. As for the factors contributing to household food insufficiency, the extent of land is a significant determinant. The biggest constraint on access to education is the difficulty in paying school fees. It is true that the government recently introduced free primary education.

Limited access to transportation networks significantly impacts economic opportunities. Villages with poor road connections struggle to transport goods to markets, hindering economic growth and development (Kostaschuk, 2022). This is further supported by studies highlighting the importance of infrastructure for rural commercialization in Ethiopia (Chang et al., 2024) and the impact of transportation costs on economic growth in Nigeria (Putra et al., 2020). The case study of Chad illustrates the significant logistical challenges faced by landlocked coun-

tries in Sub-Saharan Africa (Indonesia et al., 2025), further emphasizing the constraints on market access. The study on supply chain management challenges in Malawi, a landlocked country, also underscores these difficulties (Indonesia et al., 2025).

ANSD Sénégal (2015) described the indicators of poverty regarding meals. Households are haunted by the lack of food (65.8% in rural areas). Faced with this lack of resources, 32% of households had to skip 1 of 3 conventional meals, and 21% went without food during the day. 44% of these rural Senegalese households were unable to feed their children under the age of 15 healthily due to lack of resources. Discussing access to education, Droy (2005) asserts that the availability of schools is a determining factor: in rural areas, where children go to school on foot, or even by pirogue, a distance of several kilometers is a major handicap. The quality of schooling poses serious problems (pupil numbers, etc.) when it comes to mastering basic skills.

5.6. The Contribution of Associations and Governance, and Education

Our results show that membership of associations has a positive influence on family nutrition and the resolution of conflicts, which are very inhibiting to well-being in impoverished environments. Kahina Moussaoui and Khelloudja Arabi Megherbi propose that rural associations can support the promotion of local development by creating new relationships. These associations would: raise awareness among the population and public authorities; involve civil society; create associative networks for joint, concrete action; broaden consultation with the national and international associative movement, enabling the transfer of skills; and enhance the scientific and intangible cultural heritage. Fostering collaboration among different stakeholders (government, private sector, civil society, communities) is crucial for effective rural development (Addai et al., 2022; Oedl-Wieser et al., 2020; Ros-Tonen et al., 2015: pp. 85-105). Actively involving rural communities in the planning and implementation of development projects is crucial for ensuring that projects are relevant, sustainable, and owned by the community (Yu et al., 2024; Yar & Zazia, 2024). The importance of shifting from centralized planning to more decentralized approaches that empower local communities should be emphasized in the DRC. Strengthening local governance structures and promoting transparency and accountability can create a more conducive environment for investment and development (Cattaneo et al., 2021; Adam et al., 2024). This includes giving local governments more autonomy and involving communities in decision-making processes. This is highlighted in the context of Afghanistan (Yar & Zazia, 202) and is a recurring theme across many papers advocating for community participation. Developing policies that support rural development initiatives, including agricultural policies, infrastructure development policies, and social protection programs, is essential (Wittman & Blesh, 2017). Investing in education and training programs tailored to the needs of rural communities can

enhance human capital and create opportunities (Edirin, 2018). This includes vocational training and entrepreneurship education, besides general education, which is commonplace in our study area.

6. Limitations of the Study

The results highlighted low incomes, small landholdings, long lean seasons, and weak infrastructure, with measurable differences between infertile highlands, fertile lowlands, and peri-urban estates. The results serve as a 2017 baseline for areas now affected by renewed conflict since 2022. In such conditions, many changes quickly occur regarding exchange rates and the security situation in areas that harbor many displaced families. Potential recall bias is expected in a region where wars have been repetitive, and also where the metric system is not well used, villagers mentioning their own market units, e.g., instead of data from weighing machines and area units.

7. Conclusions and Future Prospects

The living conditions and development levels are modest and basic, as indicated by weak access to basic social services, land and human capital, local development associations, food security, access to healthcare and education, drinking water, income, housing comfort, and infrastructures. We recommend the protection of the mountainous environment; it is imperative to promote intense afforestation on mountains and hills to improve hydrology and rainfall to some extent. It is imperative to invest more in the means of production, make the most of the growing number of unemployed agricultural technicians, secure the environment, improve seed and breeding stock, promote commercial centers as a development hub and a model for conurbation and access to the market, and also to control family size and the number of dependents to some degree. Schools will play an important role, with greater emphasis on practical life from the primary school level onwards. It is true that real decentralization, properly accompanied, can bring about a great deal of progress at the grassroots level in these administrative entities, and also the improvement of food security. Households mainly propose improving farm feeder roads, promoting producers' cooperatives, and reducing taxes. Secondly, they advocate improving storage conditions, creating warehouses for unsold produce, and organizing marketing. But before this can be done, the dismemberment/degradation of family land with each inheritance needs to be drastically reduced, and the emergence of alternative employment opportunities encouraged through the development of small-scale processing units, increased local production, and the promotion of services.

Furthermore, the inheritance should be regulated for the benefit of investment prosperity, rather than abandoned to the mercy of a few clan sages who disregard national and community prosperity. Co-inheritors should find alternative employment and means. Farm boundaries should be clarified thanks to the rural land registry that has already made great legal progress. Tenants should be administra-

tively protected from landlords and vice versa.

Regarding land-grabbing, Justice and the administration as a whole should examine and find ways of promoting industrial agriculture without annihilating the means of subsistence of small rural agricultural producers. In fact, the land purchased does not offer enough jobs and remains virtually hoarded and unexploited, due to a lack of substantial investment.

To avoid floating around on pious wishes and daydreams, target-specific, research-based, achievement-oriented, and pro-poor rural development policy and implementation will be instrumental for the mitigation of rural poverty.

Conflicts of Interest

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

References

Adam, L., Sambodo, M. T., Purwanto, P., Purnagunawan, R. M., Sarana, J., Ermawati, T. et al. (2024). Village Fund and Indonesia Rural Development: Rethinking Institutional Capacity and Governance. *Journal of Infrastructure, Policy and Development, 8,* Article ID: 9875. https://doi.org/10.24294/jipd9875

Addai, G., Suh, J., & Bardsley, D. (2022). Contributions of Urban Periodic Markets to Sustainable Rural Development in Ghana: A Rural Web Analysis. *SSRN Electronic Journal.* https://doi.org/10.2139/ssrn.4234546

Adejobi, A., & Kassali, R. (2013). Markets and Rural Services as Determinants of Improved Seeds Usage by Crop Farmers in Osun State, Nigeria. *African Crop Science Journal, 21,* 143-152.

Afaha, J., & Agbaje, J. (2020). Effects of Cost of Transportation, External Capital Funding and Prices of Some Selected Staple Food Production on Economic Growth in Nigeria. *Caleb International Journal of Development Studies, 3,* 19-41. https://doi.org/10.26772/cijds-2020-03-02-02

Ahmed, S., & Eklund, E. (2019). Rural Accessibility, Rural Development, and Natural Disasters in Bangladesh. *Journal of Developing Societies, 35,* 391-411. https://doi.org/10.1177/0169796x19868318

Aleke, J. U. (2024). Understanding Financial Constraints: Causes, Effects, and Strategies for Overcoming Economic Limitations. *Newport International Journal of Current Issues in Arts and Management, 5,* 1-6. https://doi.org/10.59298/nijciam/2024/5.1.16000

Aleksandrov, I., & Fedorova, M. (2020). Development of E-Commerce, Transport and Logistics in Rural Russia: Attitudes and Obstacles. *E3S Web of Conferences, 164,* Article ID: 07008. https://doi.org/10.1051/e3sconf/202016407008

Ali, H., Shafi, M. M., Mu, R., & Ma, J. (2015). Causes and Effects of Rural-Urban Migration in Rural Areas of Khyber Pakhtunkhwa-Pakistan. *Arts and Social Sciences Journal, 6,* 1-6.

Ali, I., Khan, M., & Alam, A. (2021). What Restraints Are There on Female Education in High Mountainous Rural Areas of Gilgit-Baltistan, Pakistan. *Development in Practice, 31,* 1040-1050. https://doi.org/10.1080/09614524.2021.1907539

Alkire S., Chatterje, M., Conconi, A., Seth, S., & Vaz, A. (2014). *Poverty in Rural and Urban Areas: Direct Comparisons Using the Global MPI 2014.* OPHI Working Papers.

Ansary, M. R. (2017). Socio-Economic Factors of Dropout Situation in Rural Primary Ed-

ucation: A Study of Two Villages in Rajshahi District. *Sociology and Criminology-Open Access, 5,* Article ID: 1000176. https://doi.org/10.4172/2375-4435.1000176

ANSD Sénégal (2015). *Agence Nationale de la Statistique et de la Démographie. Enquête Démographique et de Santé Continue (EDS-Continue) 2012-2013.*

Anthopoulou, T., Partalidou, M., & Kourachanis, N. (2019). Hidden Homelessness and Poverty Trajectories in Rural Areas: Stories of Crisis Counterurbanization in Greece. *Επιθεώρηση Κοινωνικών Ερευνών, 152,* 229-256. https://doi.org/10.12681/grsr.21723

Arsalan, A. (2019). IFAD Impact Assessment—Coastal Climate Resilient Infrastructure Project (CCRIP): Bangladesh. SRPN: Social Economics (Topic).

Asantewa, J. (2024). Income-generating Activities and Economic Empowerment of Rural Women in the Mion District, Ghana: A Phenomenological Study. *International Journal of Research and Innovation in Social Science, VIII,* 2238-2250. https://doi.org/10.47772/ijriss.2024.8080168

Aslam, M., Zhiwen, L., Alwahibi, M. S., Elshikh, M. S., & Wajahat Mashkoor, S. (2024). Dynamics of Information and Communication Technologies Adoption in Pakistan's Agriculture: Implications for Rural Development. *Cuadernos de Desarrollo Rural, 21,* page. https://doi.org/10.11144/javeriana.cdr21.dict

Backonja, U., Park, S., Kurre, A., Yudelman, H., Heindel, S., Schultz, M. et al. (2022). Supporting Rural Public Health Practice to Address Local-Level Social Determinants of Health across Northwest States: Development of an Interactive Visualization Dashboard. *Journal of Biomedical Informatics, 129,* Article ID: 104051. https://doi.org/10.1016/j.jbi.2022.104051

Banzhaf, E., Anderson, S., Grandin, G., Hardiman, R., Jensen, A., Jones, L. et al. (2022). Urban-rural Dependencies and Opportunities to Design Nature-Based Solutions for Resilience in Europe and China. *Land, 11,* Article 480. https://doi.org/10.3390/land11040480

Bao, Z., Gu, X., & Zhou, Y. (2022). On Women's Basic Education in Remote Areas of China from the Perspective of the Development of Woman's Educational View. In *Proceedings of the 2022 8th International Conference on Humanities and Social Science Research (ICHSSR 2022)* (pp. 1316-1321). Atlantis Press. https://doi.org/10.2991/assehr.k.220504.237

Barini, G. O., Amima, S., Mulwa, D., & Mogeni, P. (2024). *Spatial Heterogeneity of Menstrual Discriminatory Practices against Nepalese Women: A Population-Based Study using the 2022 Demographic and Health Survey* (p. 4). medRxiv.

Braun, J. von, & McComb, J. (1993). *Urban Food Insecurity and Nutrition in Developing Countries: Trends, Policies, and Research Implications. International Food Policy Research Institute (IFPRI).* Report Number: 32.

Cattaneo, A., Adukia, A., Brown, D. L., Christiaensen, L., Evans, D. K., Haakenstad, A., McMenomy, T., Partridge, M., Vaz, S., & Weiss, D. (2021). *Economic and Social Development along the Urban-Rural Continuum: New Opportunities to Inform Policy.* Policy Research Working Papers.

Chang, Y., Zhou, J., & Ji, M. (2024). Spatial-Temporal Differentiation and Influencing Factors of Rural Education Development in China: A Systems Perspective. *Systems, 12,* Article 517. https://doi.org/10.3390/systems12120517

Chauveau, J. P., Colin, J. P., Jacob, J. P., Lavigne Delville, P., & Le Meur, P. Y. (2006). *Modes d'accès à la terre, marchés fonciers, gouvernance et politiques foncières en Afrique de L'Ouest: Résultats du projet de recherche Claims.* IIED Collection Foncier Et Ressources Renouvelables.

Cheng, S., Zhao, M., Mang, H., Zhou, X., & Li, Z. (2017). Development and Application of

Biogas Project for Domestic Sewage Treatment in Rural China: Opportunities and Challenges. *Journal of Water, Sanitation and Hygiene for Development, 7,* 576-588. https://doi.org/10.2166/washdev.2017.011

Chinniah, S. R., & Tengku Anuar, T. F. (2025). Analysis on the Influence of Place Branding Strategies on Rural Tourism: A Unified Theory of Acceptance and Use of Technology (UTAUT) Approach—A Case Study of Kampung Agong. *International Journal of Creative Future and Heritage (TENIAT), 13,* 28-38. https://doi.org/10.47252/teniat.v13i1.1314

Chowdhury, M. R., Sourav, M. S. U., & Sulaiman, R. B. (2023). The Role of Digital Agriculture in Transforming Rural Areas into Smart Villages. In S. S. Dadwal, H. Jahankhani, G. Bowen, & I. Y. Nawaz (Eds.), *Technology and Talent Strategies for Sustainable Smart Cities* (pp. 57-78). Emerald Publishing Limited. https://doi.org/10.1108/978-1-83753-022-920231003

Demchenko, O., Basiurkina, N., Popadynets, N., Minenko, S., & Sokoliuk, K. (2023). Factors and Determinants of the Development of Human Capital in Rural Areas in the Conditions of Global Challenges. *ECONOMICS, 11,* 93-108. https://doi.org/10.2478/eoik-2023-0026

Demkova, M., Sharma, S., Mishra, P. K., Dahal, D. R., Pachura, A., Herman, G. V. et al. (2022). Potential for Sustainable Development of Rural Communities by Community-Based Ecotourism a Case Study of Rural Village Pastanga, Sikkim Himalaya, India. *GeoJournal of Tourism and Geosites, 43,* 964-975. https://doi.org/10.30892/gtg.43316-910

Drago, F., Scharf, R. J., Maphula, A., Nyathi, E., Mahopo, T. C., Svensen, E. et al. (2020). Psychosocial and Environmental Determinants of Child Cognitive Development in Rural South Africa and Tanzania: Findings from the Mal-Ed Cohort. *BMC Public Health, 20,* Article No. 505. https://doi.org/10.1186/s12889-020-08598-5

Droy, I. (2005). Pauvreté, enclavement et accès à l'école primaire en milieu rural guinéen. *Mondes en développement, 132,* 111-127. https://doi.org/10.3917/med.132.0111

Dube, A., Wason, M., Satyapriya, Sitaram, Padaliya, N., & Ojha, P. (2025). Navigating the Watershed: Challenges and Opportunities for Women's Empowerment in Rural Development. *Journal of Experimental Agriculture International, 47,* 429-450. https://doi.org/10.9734/jeai/2025/v47i13243

Ebrahimzadeh, I., Tayyebi, N., & Shafei, Y. (2012). Functional Analysis of Small Towns Economic Role in Rural Development, Case Study: Zahedshahr, Iran. *Journal of Service Science and Management, 5,* 269-279. https://doi.org/10.4236/jssm.2012.53032

Edirin, E. A. (2018). Opportunities and Challenges of Economic Development in Malaysia's Rural Areas. *Trends in Undergraduate Research, 1,* 1-5.

FAO (2011). *The Role of Women in Agriculture. Bridging the Gender Gap to Support Development. The State of Food and Agriculture. Report 2010-2011.*

Gebreegziabher, Z., & van Kooten, G. C. (2019). Commodity Storage, Post-Harvest Losses, and Food Security: Panel Data Evidence from Ethiopia. *Journal of Agricultural & Food Industrial Organization, 18.* https://doi.org/10.1515/jafio-2019-0058

Gniza, I. D. (2021). *Policy Paper. Modes d'Accès à la Terre et Écart de Productivité Lié au Genre au Burkina Faso.* Gniza Innocent Daniel.

Gonin, A., & Queva, M. (2016). La France des marges: Inégalités territoriales et sociales. *Pour, 4,* 63-71. https://doi.org/10.3917/pour.232.0063

Gontijo, H. M., Ribeiro, S. D. S., & Lima, S. C. R. B. D. (2024). Water and Sanitation Sewage Management in Divinópolis/mg: The Current Discourse on Urban/Rural Fragmenta-

tion. *Revista de Economia e Sociologia Rural, 62,* e265399. https://doi.org/10.1590/1806-9479.2023.265399en

Gowdhaman, P., Devi, M. N., C, K., N, S., & Selvi, R. G. (2024). Analyzing Agrotourism Challenges in Coimbatore: A Rank Based Quotient (RBQ) Approach. *Journal of Scientific Research and Reports, 30,* 735-743. https://doi.org/10.9734/jsrr/2024/v30i82294

Gyawali, K. P. (2022). Role of Social Media in Commercial Vegetable Farming for Rural Development. *Saptagandaki Journal, 13,* 101-115. https://doi.org/10.3126/sj.v13i1.54949

Habib, M., Ejaz, L., & Alvi, G. (2024). Empowering Women's Educational Journeys: Navigating Challenges in Pursuit of Higher Education in Dera Ghazi Khan. *Journal of Development and Social Sciences.*

Helmeczi, G. (2024). The Impact of Socio-Economic Factors and Inequalities on Labour Market Opportunities. *The Annals of the University of Oradea. Economic Sciences, 33,* 67-74. https://doi.org/10.47535/1991auoes33(1)008

Hidayat, M. S., Nugroho, A. P., Sutiarso, L., & Okayasu, T. (2019). Development of Environmental Monitoring Systems Based on Lora with Cloud Integration for Rural Area. *IOP Conference Series: Earth and Environmental Science, 355,* Article ID: 012010. https://doi.org/10.1088/1755-1315/355/1/012010

Hoang, Q. V. (2020). Determinants of the Result of New Rural Development Program in Vietnam. *Journal of Economics and Development, 22,* 81-90. https://doi.org/10.1108/jed-12-2019-0076

Ibani, B. G. (2019). Promoting Rural Development in Nigeria: A Study of the Communityself-Help Strategy in Bayelsa State. *Wilberforce Journal of the Social Sciences, 4,* 126-150. https://doi.org/10.36108/wjss/9102.40.010280

IIED (2017). *Land Acquisitions and Rights, Food and Agriculture. Access to Agricultural Land in a Hurry in Sub-Saharan Africa.* http://pubs.iied.org/17399FIIED

Ijatuyi, E. J., Oladele, O. I., Abiolu, O. A., & Omotayo, A. O. (2022). Socioeconomic Determinants of Female Development in the Rural North West Province of South Africa. *Sustainability, 14,* Article 547. https://doi.org/10.3390/su14010547

Indonesia, A. B. P. E. N., Falarima, D. P., Khaidir, S., Surida, A., MS, N. M., & S, T. C. O. (2025). Governing the Boundary: Between Socio-Environmental Vulnerability and State Capacity in Temajuk Village, Indonesia. *Otoritas: Jurnal Ilmu Pemerintahan, 14,* 712-729. https://doi.org/10.26618/ojip.v14i3.15657

Jawairia, Bari, A., & Khan, A. (2024). Socio-Economic and Gender Disparities in Psychological Distress and Marital Adjustment among Spouses of Hepatitis C Patients: A Quantitative Assessment. *Journal of Asian Development Studies, 13,* 101-109. https://doi.org/10.62345/jads.2024.13.4.8

Jodha, N. (2002). *Poverty Alleviation in Mountain Areas of China.* Institute of Mountain Hazards and Environment (Chengdu) & InWEnt Capacity Building International, Germany. IFAD & ICIMOD.

Kapsalis, T. A. (2023). Sustainable Rural Community Development Experiences and Lessons. *Journal of Biomedical Research & Environmental Sciences, 4,* 891-895. https://doi.org/10.37871/jbres1750

Khazami, N., Nefzi, A., & Yahyaoui, A. (2023). Role of Rural Women on the Agritourism Entrepreneurial Behavior in Tunisia. *Cogent Business & Management, 11,* Article ID: 2292313. https://doi.org/10.1080/23311975.2023.2292313

Knieć, W., & Goszczyński, W. (2022). Local Horizons of Governance. Social Conditions for Good Governance in Rural Development in Poland. *European Countryside, 14,* 27-

50. https://doi.org/10.2478/euco-2022-0002

Kostaschuk, V. (2022). Transport and Geographic Location of Recreational and Tourist Centers as a Factor in the Development of Tourism (on the Example of Chernivtsi Oblast). *Scientific Herald of Chernivtsi University. Geography, No. 839,* 58-68. https://doi.org/10.31861/geo.2022.839.58-68

Kour, G., & Yadav, U. (2024). Role and Impact of Women Entrepreneurs for the Rural Development in Jammu, J&K, India and Its Major Socio-Economic Factors. *ShodhKosh: Journal of Visual and Performing Arts, 5,* 952-958. https://doi.org/10.29121/shodhkosh.v5.i5.2024.4771

Kulshreshtha, S. (2020). Comparative Analysis of Adopted Rural Development Measures in Saskatchewan: Five Case Studies. *Universal Journal of Agricultural Research, 8,* 59-69. https://doi.org/10.13189/ujar.2020.080301

Kumar, V., & Khunger, S. (2025). Rural Development in Haryana: Gender Dynamics, Infrastructure, and Agricultural Progress. *Dynamics of Rural Society Journal, 3,* 61-76. https://doi.org/10.37905/drsj.v3i1.43

Kumari, R. (2024). Status of Women Education in Rural Bihar. *Interantional Journal of Scientific Research in Engineering and Management, 8,* 1-7. https://doi.org/10.55041/ijsrem39127

Leimbigler, B., Li, E. P. H., Rush, K. L., & Seaton, C. L. (2022). Social, Political, Commercial, and Corporate Determinants of Rural Health Equity in Canada: An Integrated Framework. *Canadian Journal of Public Health, 113,* 749-754. https://doi.org/10.17269/s41997-022-00630-y

Li, Y., Liu, Y., Long, H., & Wang, J. (2013). Local Responses to Macro Development Policies and Their Effects on Rural System in China's Mountainous Regions: The Case of Shuanghe Village in Sichuan Province. *Journal of Mountain Science, 10,* 588-608. https://doi.org/10.1007/s11629-013-2544-5

Lupenko, Y., Iegorov, B., Nemchenko, V., & Lagodiienko, N. (2024). Theoretical Foundations of Human Capital Development in Rural Areas. *Actual problems of innovative economy and law, 2024,* 55-60. https://doi.org/10.36887/2524-0455-2024-6-11

Macken-Walsh, Á., & Curtin, C. (2013). Governance and Rural Development: The Case of the Rural Partnership Programme (RPP) in Post-socialist lithuania. *Sociologia Ruralis, 53,* 246-264. https://doi.org/10.1111/j.1467-9523.2012.00578.x

Mahali, D., & Bhattacharyya, D. (2025). Pseudo Development & Philosophical Crisis of Scheduled Tribe Students in West Bengal. *International Journal for Multidisciplinary Research, 7,* 1-14.

Maksimović, M., Janovac, T., Karabašević, D., & Brzaković, M. (2018). Solution of General and Prevention of Ecological Problems of Stara Planina Mountain as Potential Obstacles to the Development of Rural Tourism. *Ekonomika Poljoprivrede, 65,* 531-544. https://doi.org/10.5937/ekopolj1802531m

Mensah, K., & FitzGibbon, J. (2012). Tasty Water of the Good Samaritan: Collaborative Governance and Rural Capacity Enhancement for Adapting Water Sources to Climate Change. *African Geographical Review, 31,* 163-182. https://doi.org/10.1080/19376812.2012.728481

Menyah, M. V., Zhaung, J., Osei, C. D., Akrashie, R., & Darkwah, E. (2020). Determinants of Entrepreneurial Orientation: A Study of Rural Entrepreneurs in Jiangsu Province, China. *EPRA International Journal of Multidisciplinary Research, 6,* 173-185.

Miao, X., Han, J., Wang, S., & Han, B. (2023). Impacts of Family Care for Children and the Elderly on Women's Employment: Evidence from Rural China. *Frontiers in Psychology,*

14, Article 1208749. https://doi.org/10.3389/fpsyg.2023.1208749

Mihai, F., Gündoğdu, S., Markley, L. A., Olivelli, A., Khan, F. R., Gwinnett, C. et al. (2021). Plastic Pollution, Waste Management Issues, and Circular Economy Opportunities in Rural Communities. *Sustainability, 14,* Article 20. https://doi.org/10.3390/su14010020

Ministère du Plan, République Démocratique du Congo (2011). *Document de Stratégie de Croissance et de Réduction de la Pauvreté—Deuxième génération (DSCRP II), Volume 1.* Ministère du Plan, République Démocratique du Congo.

Moskvicheva, A. S., Davidov, D. R., & Shikina, I. B. (2025). Features of Providing Primary Health Care to Foreign Workers in Rural Areas: Barriers and Ways to Overcome Them. In Editors, *Scientific Research of the SCO Countries: Synergy and Integration* (pp. 137-142). Crossref. https://doi.org/10.34660/inf.2025.45.31.088

Mosweunyane, D. (2024). Wretched Lives in a Westernised African Country: The Obstacles Towards Development of Communities in Botswana. *International Journal for Multidisciplinary Research, 6,* 1-10.

Muhardi, M., Mafruhat, A. Y., Cintyawati, C., Ramli, T. A., Sabar, R., Ahmad, H. et al. (2020). New Holistic Strategy of Sustainable Rural Development Management-Experience from Indonesia: A PESTEL-SOAR Analysis. *International Journal of Sustainable Development and Planning, 15,* 1025-1033. https://doi.org/10.18280/ijsdp.150707

Muhtar, M., Tuhumury, J. J., Khairunnisa, A., & Fretes, J. D. (2024). Analysis of Social and Economic Inequality in Access to Health Services: A Case Study in an Urban Area. *Socious Journal, 1,* 1-11. https://doi.org/10.62872/ywsnhj13

Muzekenyi, M., Zuwarimwe J, J., & Kilonzo, B. (2023). Economic Challenges Limiting Small-Scale Commercial Farming Development in Rural Areas of South Africa. *African Journal of Food, Agriculture, Nutrition and Development, 23,* 23026-23038. https://doi.org/10.18697/ajfand.119.22900

Nadim, S. J., & Nurlukman, A. D. (2018). The Impact of Women Empowerment on Poverty Reduction in Rural Area of Bangladesh: Focusing on Village Development Program. *Journal of Government and Civil Society, 1,* 135-157. https://doi.org/10.31000/jgcs.v1i2.444

Nguyen, N. M. T., Cai, Z., & Zhang, T. (2025). Market-Oriented Land Transfers in Rural Vietnam: Navigating Challenges for Sustainable and Equitable Development. *Frontiers in Environmental Science, 13,* Article 1534624.

Oedl-Wieser, T., Hausegger-Nestelberger, K., Dax, T., & Bauchinger, L. (2020). Formal and Informal Governance Arrangements to Boost Sustainable and Inclusive Rural-Urban Synergies: An Analysis of the Metropolitan Area of Styria. *Sustainability, 12,* Article 10637. https://doi.org/10.3390/su122410637

Okosun, A. E., Okeke, F. O., Igwe, A. E., Ezema, E. C., & Okpalike, C. O. (2023). Rural Area Infrastructural Challenges and the Role of Architecture in Urban-Rural Development in Nigeria. *European Journal of Sustainable Development, 12,* 305-318. https://doi.org/10.14207/ejsd.2023.v12n4p305

Okpa, J. T. (2022). Exploring the Relationship between Infrastructural Development and Socioeconomic Well-Being in Rural Areas: Evidence from Bakassi, Cross River State, Nigeria. *Journal of Socioeconomics and Development, 5,* 153. https://doi.org/10.31328/jsed.v5i2.3618

Phayayam, T., Thekkuveettil, M. A., & Wani, N. H. (2024). Cultural Traditions and Women's Empowerment: A Closer Look at Southern Thailand. *International Journal for Multidisciplinary Research, 6,* 1-7.

Putra, A., Tong, G., & Pribadi, D. (2020). Spatial Analysis of Socio-Economic Driving Fac-

tors of Food Expenditure Variation between Provinces in Indonesia. *Sustainability, 12,* Article 1638. https://doi.org/10.3390/su12041638

Qutieshat, R., & Al-Assaf, T. (2024). Assessing the Regional Socio-Economic Disparities, Evidence from Jordan. *Dirasat: Human and Social Sciences, 51,* 325-341. https://doi.org/10.35516/hum.v51i4.4340

Rashid, M. F. A., Lim, S. B., Kamar, M. A. A., Azman, M. A. A., & Rejab, H. S. M. (2023). Malaysia Assessment Measure for Modern Rural Development (MAMRD): Appraisal Index and Intervention. *Planning Malaysia, 21,* 349-363.

Ray, N. (2013). Factors Influencing Tourists' Motivational Determinants for Promotion of Tourism Destination. In R. Khurana, & R. Aggarwal (Eds.), *Interdisciplinary Perspectives on Business Convergence, Computing, and Legality* (pp. 26-35). IGI Global. https://doi.org/10.4018/978-1-4666-4209-6.ch003

Report of the Commission on the Status of Women 2018.

Rönkkö, E., Luusua, A., Aarrevaara, E., Herneoja, A., & Muilu, T. (2017). New Resource-Wise Planning Strategies for Smart Urban-Rural Development in Finland. *Systems, 5,* Article 10. https://doi.org/10.3390/systems5010010

Ros-Tonen, M., Pouw, N., & Bavinck, M. (2015). Governing Beyond Cities: The Urban-Rural Interface. In J. Gupta, K. Pfeffer, H. Verrest, & M. Ros-Tonen (Eds.), *Geographies of Urban Governance* (pp. 85-105). Springer International Publishing. https://doi.org/10.1007/978-3-319-21272-2_5

Saeed, S., Butt, H., & Saif, A. (2025). Uncovering the Lived Experiences and Prenatal Care Disparities among Women in Rural Communities in Muzaffarabad (Azad Jammu and Kashmir). *Journal of Asian Development Studies, 14,* 124-134. https://doi.org/10.62345/jads.2025.14.2.10

Salvati, L., Tombolini, I., Gemmiti, R., Carlucci, M., Bajocco, S., Perini, L. et al. (2017). Complexity in Action: Untangling Latent Relationships between Land Quality, Economic Structures and Socio-Spatial Patterns in Italy. *PLOS ONE, 12,* e0177853. https://doi.org/10.1371/journal.pone.0177853

Santos, J. D. S. D., Faccioli, G. G., Sousa, I. F. D., & Lima, R. G. (2024). Rural Sanitation and the Challenges for Universalization: Evaluation of the Municipalities of Brejo Grande and Ilha Das Flores in Baixo São Francisco Sergipano. *Revista de Gestão Social e Ambiental, 18,* e07542. https://doi.org/10.24857/rgsa.v18n7-138

Sarkar, B. C. (2013). Role of Socio-Economic Factors on Imbalanced Regional Development in West Bengal, India. *Journal of Geography and Regional Planning, 6,* 10-18. https://doi.org/10.5897/jgrp12.003

Sehgal, M., Jatrana, S., Johnson, L., & Ghosh, S. K. (2024). Assessing Child Health in India: Development and Validation of a Comprehensive Child Health Index. *Child Indicators Research, 17,* 657-682. https://doi.org/10.1007/s12187-024-10112-x

Sharma, R. R. (2021). Sustainable Political Leadership Based on System Thinking in Rural Development Practices of Nepal. *Research Nepal Journal of Development Studies, 4,* 93-105. https://doi.org/10.3126/rnjds.v4i2.42689

Sheelanere, P., & Kulshreshtha, S. (2013). Sustainable Biofuel Production: Opportunities for Rural Development. *International Journal of Environment, 2,* 1-13.

Shoukat, G., Awan, S. M., & Jokhiyo, F. (2025). Female Participation in Education and Representation in Politics in Sindh, Pakistan: Challenges and Opportunities. *ProScholar Insights, 4,* 52-60. https://doi.org/10.62997/psi.2025a-41044

Shrestha, A., Stamatakis, K., Ballard, J., Burgess, A., & Baker, E. (2023). Engaging Rural Communities to Incorporate Social Determinants in Developing Strategies to Improve

Access to Health Care in the Missouri Bootheel Counties. *Rural and Remote Health, 23,* 7678. https://doi.org/10.22605/rrh7678

Singh, L. (2025). Determinants of Utilization of Health Care Services during Pregnancy/delivery Complications in Rural Allahabad District of Uttar Pradesh, India. *Stallion Journal for Multidisciplinary Associated Research Studies, 4,* 15-21. https://doi.org/10.55544/sjmars.4.2.3

Stanovcic, T., Peković, S., Vukčević, J., & Perović, D. (2018). Going Entrepreneurial: Agro-Tourism and Rural Development in Northern Montenegro. *Business Systems Research Journal, 9,* 107-117. https://doi.org/10.2478/bsrj-2018-0009

Suparmi, Kusumawardani, N., Nambiar, D., Trihono, & Hosseinpoor, A. R. (2018). Sub-national Regional Inequality in the Public Health Development Index in Indonesia. *Global Health Action, 11,* 41-53. https://doi.org/10.1080/16549716.2018.1500133

Tham, J., Azam, S. M. F., & Albattat, A. R. (2021). Critical Online Learning Implementation and Determinants in Rural Areas in Malaysia. In C. Kahl (Ed.), *Higher Education Challenges in South-East Asia* (pp. 222-237). IGI Global. https://doi.org/10.4018/978-1-7998-4489-1.ch012

Tint, P., Urbane, V., Vilcane, I., & Tint, M. (2025). Risk Management of Health Hazards in Rural Areas in Adapting Process to Rapidly Changing World. In *Engineering for Rural Development* (pp. 312-318). Latvia University of Life Sciences and Technologies, Faculty of Engineering and Information Technologies. https://doi.org/10.22616/erdev.2025.24.tf068

Togaymurodov, E., Roman, M., & Prus, P. (2023). Opportunities and Directions of Development of Agritourism: Evidence from Samarkand Region. *Sustainability, 15,* Article 981. https://doi.org/10.3390/su15020981

Udoka, E. V. H., Eniru, E. I., Itafe, V. A., Kelechi, J. U., Ugwu, C. N., Ogenyi, F. C., & Mbonu, C. I. (2024). Challenges and Opportunities in Optimizing Hybrid Renewable Energy Systems for Grid Stability and Socio-Economic Development in Rural Sub-Saharan Africa: A Narrative Review. *KIU Journal of Science Engineering and Technology, 3,* 132-146.

Uprety, K. (2025). Social Determinants of Health: A Deep Dive into Nepalese and American Societies. *Rural Development Journal, 5,* 62-67. https://doi.org/10.3126/rdj.v5i1.75149

Vickerman, S. A., Benjamin, F., Chinyakata, R., Mpilo, M., & Roman, N. (2025). "We Are a Family That Doesn't Have Much Every Day, So We Eat What We Get": The Bodily Health of a Group of Rural Women Living in South Africa. *Journal of Rural and Community Development, 20,* 21-41. https://doi.org/10.63315/jrcd.v20i1.2361

Voronov, V. V. (2022). Small Towns of Latvia: Disparities in Regional and Urban Development. *Baltic Region, 14,* 39-56. https://doi.org/10.5922/2079-8555-2022-4-3

Wang, J., & Wang, Y. (2023). Economic Performance of Rural Collective-Owned Cooperatives: Determinants and Influence Mechanism. *Annals of Public and Cooperative Economics, 95,* 629-653. https://doi.org/10.1111/apce.12454

Wang, S. (2021). The Influence of Family Background and Parents' Education Level on the Income of Their Children. *Academic Journal of Humanities & Social Sciences, 4,* 34-37.

Wei, L., Di, J., & Zhou, Q. (2025). Exploring the Pathways through Which the Digital Economy Drives Common Prosperity in the Context of Sustainable Development. *Sustainability, 17,* Article 3709. https://doi.org/10.3390/su17083709

Westgard, C., & Alnasser, Y. (2017). Developmental Delay in the Amazon: The Social Determinants and Prevalence among Rural Communities in Peru. *PLOS ONE, 12,* e0186263.

https://doi.org/10.1371/journal.pone.0186263

Withanage, W. K. N. C. (2018). Urban-rural Interactions and Role of Planned Small Townships in North Central Province, Sri Lanka: An Empirical Investigation of Urban Functions for Rural Development Approach. *Journal of Social Sciences and Humanities Review, 3,* 133-155. https://doi.org/10.4038/jsshr.v3i3.12

Wittman, H., & Blesh, J. (2017). Food Sovereignty and *Fome Zero*: Connecting Public Food Procurement Programmes to Sustainable Rural Development in Brazil. *Journal of Agrarian Change, 17,* 81-105. https://doi.org/10.1111/joac.12131

Wojewódzka-Wiewiórska, A., & Vilma Atkočiūnienė, G. (2020). New View to the Living Conditions in Rural Areas. *Rural Development 2019, 2019,* 515-520. https://doi.org/10.15544/rd.2019.079

Wojewódzka-Wiewiórska, A., Kłoczko-Gajewska, A., & Sulewski, P. (2019). Between the Social and Economic Dimensions of Sustainability in Rural Areas—In Search of Farmers' Quality of Life. *Sustainability, 12,* Article 148. https://doi.org/10.3390/su12010148

Wood, E. A., Wilson, K. E., & Jacobs, K. D. (2021). Exploring the Differences between Men's and Women's Perceptions of Gender-Based Violence in Rural Tajikistan: A Qualitative Study. *BMC Women's Health, 21,* Article No. 91. https://doi.org/10.1186/s12905-021-01227-2

Wu, Y. (2024). A Study on the Path of Rural Sustainable Development in Henan Area-Xincai County. *Environment, Social and Governance, 1,* 34-43. https://doi.org/10.70267/89fjn518

Xu, R., Yue, W., Wei, F., Yang, G., Chen, Y., & Pan, K. (2022). Inequality of Public Facilities between Urban and Rural Areas and Its Driving Factors in Ten Cities of China. *Scientific Reports, 12,* Article No. 13244. https://doi.org/10.1038/s41598-022-17569-2

Yar, F. G. M., & Noori, A. S. (2024). Challenges and Constraints in the Economic Development of Rural Areas in Afghanistan and Solutions for Development. *Jurnal Syntax Transformation, 5,* 1255-1262. https://doi.org/10.46799/jst.v5i11.1020

Yar, F. G. M., & Zazia, J. G. (2024). Obstacles and Challenges of Rural Development in Afghanistan: Examining Problems and Solutions: A Review. *Formosa Journal of Multidisciplinary Research, 3,* 3639-3656. https://doi.org/10.55927/fjmr.v3i9.11564

Yesigat, A., & Awoke, W. (2024). Determinants of Rural Women Economic Empowerment: The Case of Bahir Dar Zuria Woreda in Amhara Region, Ethiopia. *African Journal of Science, Technology, Innovation and Development, 16,* 929-939. https://doi.org/10.1080/20421338.2024.2398295

Yu, Y., Appiah, D., Zulu, B., & Adu-Poku, K. A. (2024). Integrating Rural Development, Education, and Management: Challenges and Strategies. *Sustainability, 16,* Article 6474. https://doi.org/10.3390/su16156474

Zakshevsky, V. G., Charykova, O. G., & Merenkova, I. N. (2019). Strategic Priorities for Developing the Agro-Industrial Complex and Rural Areas of the Region. *IOP Conference Series: Earth and Environmental Science, 274,* Article ID: 012007. https://doi.org/10.1088/1755-1315/274/1/012007

Zhang, X., Zhou, J., Dai, X., Hou, F., Gao, Y. Y., Yan, L. Q., & Yuan, P. (2020). [Young Children's Family Sex Education in Rural Areas of Sichuan Province and Its Influencing Factors]. *Acta Academiae Medicinae Sinicae, 42,* 452-458.

Zhou, X., & Lai, Y. M. (2023). Subjectivity Construction of Chinese Rural Women's Political Participation: Perspective of Rural Governance Modernization. *Malaysian Journal of Social Sciences and Humanities (MJSSH), 8,* e002356. https://doi.org/10.47405/mjssh.v8i6.2356