

# **Climate Change Vulnerability in the Peri-Urban Areas of the Rural Regions of Namibia**

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## **SUMMARY**

Following the urban-rural continuum thinking, no geographical place (nation, region or local area) can be fully rural or urban. They are usually a mix of both urban and rural. They tend to be referred to as urban or rural depending on whether their spatial character is rural or urban. In many developing countries, there may be urban or rural transitioning spatial units. These are peripheries located between urban and rural areas, usually having a more balanced mixed spatial character of land uses. In the context of Namibia, the northern region is more rural than the southern and central belt. However, these regions face similar problems at different scales. For instance, the north faces more rural development problems than the south while the south faces more urban problems than the north. In all these places, there is evidence from current literature that climate change is a problem in the region of Northern Namibia. The authors of this paper use their experience living in Namibia to identify climate vulnerability scenarios in the peri-urban areas of Northern Namibia and ideas for improving their resilience.

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## **1. INTRODUCTION**

Research of the urban periphery has become an important emerging theme in urban discourse (Yang & Ye, 2020). Over the past few years, the world has witnessed a rapid modification of existing urbanization patterns which have progressively modified the concept of peripheries (Vindigni, Graziano, Martelliano, & Messina, 2021). They are categorized as a place of fast and unplanned settlement growth resulting in environmental degradation and negative health issues. Peri-urban areas are what is mostly located on the peripheries or the outer limits of urban areas. The term peri-urban is a complex term to define due to its shifting nature (Webster & Muller, 2009). Peri-urban areas are zones of transition from rural to urban land (McConville, 2014), serving as an interface. These areas can be imagined as zones that overlap rural and urban jurisdiction and are linked to the urban cities' economy, experience, and constant transformations. However, these areas have no standard clarifications or clear boundaries that describe the interface between rural and urban activities. They are constantly under pressure because of the increased demand of either meeting development needs for conservation, economic development, or environmental protection (Le & Ha, 2019). The jurisdiction of peri-urban areas is unclear and is characterized by heterogeneity, discontinuity, and spatial and social fragmentation (Vindigni, Graziano, Martelliano, & Messina, 2021).

Due to the nature of peri-urban areas, the majority are not directly catered for in national planning priorities. This leaves them as victims of the negative impacts of climate change. Households living on the periphery are often negatively affected during increased flooding, with limited options on where to move. This was evident in recent floods in northern Namibia, where whole communities that were settled on the flood path had to relocate. Most of the

Namibian population is projected to be urban rather than rural in the future, reflecting the global urban population. The rate of urbanization (of 40%) is happening at an even faster rate than expected before (Delgado, 2018). The current estimate foresees an increase of 3.98 million people by means of rural-urban migration by 2050 (Venditto, Kamwanyah, & Nekare, 2022). This means there will be increased demands and pressures on urban areas to cater for inevitable population growth. In this context, the peri-urban areas have tended to cater as catchment areas to the growing urban population. This has made peri-urban areas of importance in providing sustainable living spaces for the communities currently residing in them. The peri-urban areas have seen a wide range of uses, such as forestry recreation, water catchment areas and productive farming and agriculture, which unfortunately due to poor governance and lack of clear policies have seen a great loss of biodiversity, vegetation and land use change. Therefore, this study provides an overview of the climate change vulnerability in the peri-urban areas and how these areas can be made more resilient from the adverse effects of climate change.

## **2. CLIMATE CHANGE VULNERABILITIES IN THE PERI-URBAN AREAS**

Although the rapid growth of peri-urban areas is a global phenomenon, the drivers of peri-urban growth differ from country to country. In Namibia, peri-urban areas located in the Northern parts are mostly concentrated on communal land. Communal land covers 39% of the land space (Werner, 2021). This figure is rapidly decreasing due to the expansion of urban areas. The urban areas boundaries in the northern parts of Namibia have been proclaimed on existing communal land which has resulted in the alienation of even further communal land when urban areas expanded. The peri-urban areas on the peripherals of the urban centers are just located adjacent to the local authority areas. These peri-urban areas are near urban areas and most of the residents from these areas work and rely on the services (i.e., shopping centers, banking institutions, etc.) from the urban center close to them. These peri-urban areas are growing at a very unprecedented pace which is accompanied by similar unprecedented challenges. In effect, agricultural and pastoral operations that rely primarily on rainwater supplies are expanding and becoming more vulnerable to changes in rainfall patterns.

The peri-urban areas in the northern parts of Namibia offer an interesting case study that requires creativity and innovative ways of addressing the challenges experienced. Looking at Omuthiya Town as an example, the town of Omuthiya is the current capital of Oshikoto Region with a population of 5 000 residents within its boundaries (Omuthiya Town Council, 2018). The total constituency of Omuthiya (incl. neighboring villages), however, has a population of 26 183 which is continuously growing (Oshikoto Regional Council, n.d). The peri-urban area is located outside the jurisdiction of the local authority. Because of its location, the local authority does not extend its services (i.e., water connections, sewer & waste) and infrastructures to these areas. This service also excludes the legal recognition of the land that they are currently occupying. As mentioned before, the peri-urban area is mostly concentrated on communal land of which the Communal Land Reform Act (CLRA) is also silent on the administration of the fragmented peri-urban areas that infringe on communal land. The CLRA currently offers three different types of rights, namely customary, leasehold and occupational land rights (Republic of Namibia, 2002). Occupational land rights are only granted to a government institution or any other institution that provides public services to the communities within the communal land e.g., church facilities, schools, health centers and other government projects. The right to a leasehold is only granted for commercial use and is not conformed to individuals that are registering for the purpose of residential use. Customary land rights may allocate a right to a residential unit under the act, but due to the nature of peri-urban areas and how they are planned, the right of residence is difficult to administer without proper demarcation of the peri-urban areas. Lastly, the CLRA has however made provision for a third right under the customary land right which is a right for any other form of customary tenure as may be recognized and described by the Minister, but this right has never been registered before in Namibia (Republic of Namibia, 2002).

Because of the lack of clear policies on management of peri-urban areas, these areas tend to grow uncontrolled with a lack of statutory development plans, proper land-use planning and building by-laws, and institutional monitoring systems (Aijaz, 2019). The absence of institutional structures in peri-urban areas also tends to lead to weak governance that should

have been able to sustain and resolve the challenges experienced within these areas. The peri-urban areas become dumping grounds of liquid and solid waste, which causes it to become particularly vulnerable to crime, pollution and health hazards. The lack of proper governance and control of peri-urban areas has resulted in settlements being informally developed with informal structures which are most often settled on by low-income communities for economic, political, and legal reasons (Winter & Karvonen, 2022). These challenges experienced have all been increasingly worsened by the impacts of climate change in developing countries. Their illegality has made government agencies unable or unwilling to work with them (Satterthwaite, et al., 2020). These areas are ill prepared for climate change and face particularly high floods because of the poor-quality buildings and lack the proper infrastructures to prevent flooding or withstand heavy heat waves.

### **3. CLIMATE CHANGE VULNERABILITY IN SUB-SAHARAN AFRICA**

Sub-Saharan Africa is the world's most vulnerable region to climate change, coupled with rising temperatures, rising sea levels, and rainfall anomalies are increasing (International Monetary Fund, 2020). According to Dia and Beaudelaire (2021), Africa is the most vulnerable continent to climatic variability and change, a situation compounded by the combination of "multiple constraints" such as widespread poverty and a lack of adaptation capacity. Urbanization is one of the most significant structural changes that Sub-Saharan Africa (SSA) has seen throughout time (Potts, 2018). Indeed, according to United Nations projections, cities would house 56% of the SSA population by 2050 (United Nations Department of Economic and Social Affairs (UNDESA), 2015). As climate change causes more frequent and damaging extreme storms, droughts, and wildfires, an increasing number of populations around the world face extinction owing to ongoing damage that makes them vulnerable (Bitting, Atangana & Tabi, 2022). According to Smit, Klein and Wandel, (2000), vulnerability is defined as the "degree to which a system is susceptible to injury, damage, or harm." Meanwhile, Blaikie, Cannon and Wisner (1994), interpret vulnerability as "the characteristics of an individual or group in terms of their capacity to anticipate, cope with, resist, and recover from the impact of a natural hazard." Lipton (1977) found from an analysis of urbanization in developing nations that there is a bias in favor of the city due to the over-investment of most national resources in cities. The effect of urban

bias can also be seen in the disparities in consumption, salaries, and production between urban and rural areas (Lipton, 1977). This gap is the outcome of state policies that favor urban investment at the expense of rural and thus agricultural investment. Climate change and its consequences have only exacerbated the situation. Economic development has produced significant improvements in recent decades, but the resilience and coping mechanisms remain limited across Sub-Saharan Africa, indicating structural issues that hinder countries' ability to adapt to and recover from climate change effects (International Monetary Fund, 2020). The region's substantial reliance on rain-fed agriculture increases humanitarian, social, and macroeconomic vulnerabilities to rising temperatures and harsh weather shocks, which disproportionately affect the poorest sectors of the rapidly increasing population. The consequent amplification of inequities and shortage of productive lands, along with rapid population expansion, raises the possibility of mass migration and conflict.

#### **4. EXPERIENCE OF CLIMATE CHANGE VULNERABILITIES IN NORTHERN NAMIBIA**

One of the most persistent natural disasters in Namibia has been flooding. The northern part of Namibia has been particularly the most affected areas due to flooding (Niipare, Jordaan, & Siyambongo, 2020). Besides the natural heavy rainfalls experienced in Namibia, additional water flowing from bordering areas of Southern Angola has also caused flooding in the northern parts of Namibia (Davies, 2023). As of this year, 2023, local media has already reported dozens of homes and villages left flooded due to the excessive water from heavy rainfall. Floods have had significant impacts on the affected areas such as displacements of population, loss of livestock, and destruction of homes and crops (Milanés, González, Rubio, & Concepción, 2011).

The lack of a governance system makes land-use planning regulations one of the major weaknesses that peri-urban areas have as the adverse impacts of climate change. Peri-urban areas are constructed in riverbeds and are thus prone to floods. The construction and planning of these areas are done without municipality approvals or traditional authority permissions which increases the risks of floods. The dwellings are arranged in such a manner that the direct

flow of water has no way of passing through the existing areas. The constant change in the land use within these areas has transformed the land which was suitable for development into high-risk flood zones (Winter & Karvonen, 2022). The increased population within these areas has also increased the pressures on the natural resources which in turn also contributes to the environmental damage. Furthermore, the illegality and lack of ownership have also contributed to the increased risk of climate change in peri-urban areas. Because the areas are being labeled as illegal and outside the jurisdiction of the local authority, they are generally excluded from local authority infrastructures that have been put in place to mitigate climate change (Le & Ha, 2019). They are also socially excluded which also increases their risks and vulnerability as they have limited awareness or warning systems on flood risks and any other climate change impacts. The perception of what people believe is contributing to or worsening climate change is also very important to determine and know. The communities that reside in the peri-urban areas agree to stay because of the proximity and access to urban centers while evading the high expanses of living within the urban centers (Petrovici, Poenaru, & Mare, 2023). The perceptions that the communities have on the actual causes of climate change can contribute to them choosing to stay in a hazardous environment over the benefits of staying close to the urban center.

## **5. MEASURES FOR PERI-URBAN RESILIENCE IN NORTHERN NAMIBIA**

To address the peri-urban challenges faced in the peri-urban areas in the Northern parts of Namibia, significant attention should be shifted to current governance challenges experienced in peri-urban spaces. Weak land governance has had a negative adverse effect on the growth of unplanned peri-urban areas which has been worsened by climate change (Nuhu, 2019). Thus, to better improve the governance of peri-urban areas, a balanced development and inclusive approach should be adopted for the peri-urban areas. The priorities of all parties should be aimed at bringing development and improving the livelihoods of the people within these areas. This includes introducing a national instrument for land-use planning and land tenure as well

as monitoring systems for peri-urban areas (Steel, Abukashawa, & Hussein, 2019). Below are measures/recommendations for peri-urban spaces:

### **Land governance**

- Initiatives for regularization and registration: Regularization and registration programs work to secure land tenure by formally recognizing and formalizing land rights in squalid areas. By decreasing the possibility of eviction and offering a legal foundation for long-term investment and settlement improvement, this policy can help communities become more resilient (Carrilho, & Trindade, pp. 12-13, 2022).
- Community involvement: By ensuring the community's participation, giving them influence over decisions, and cultivating a feeling of ownership and responsibility, involving the community in land regularization processes helps improve resilience. Engagement in the community can help resolve future disputes, strengthen social ties, and advance sustainable development (McEvoy, Mitchell & Trundle, 2020).
- Recognition of secondary and communal rights: To ensure that these rights are safeguarded alongside individual rights, resilient measures should respect and recognize secondary and community land rights. This strategy promotes social fairness, solidifies links within the community, and aids in preventing marginalization and the fragmentation of conventional farming systems (Carrilho, & Trindade, 2022).
- Resilient land regularization strategies should consider the need for sustainable conditions, considering elements like environmental preservation, social equity, and cultural preservation. Processes for regularizing land can support long-term sustainability and prevent detrimental effects on ecosystems and vulnerable individuals by establishing the proper conditions (Carrilho, & Trindade, 2022).

### **Environmental Regulatory Practices**

- Resilient measures encourage environmentally conscious behavior among professionals and landowners in peri-urban informal settlements to achieve sustainability. Giving incentives, such tax breaks or recognition, for implementing sustainable practices that support environmental preservation can be one way to do this (Carrilho, & Trindade, p.15, 2022).
- Resolution of land-related disputes: Creating procedures for settling land-related disputes in peri-urban informal settlements is one resilient measure. These agreements can settle disagreements and reduce potential tensions by offering accessible and fair conflict resolution procedures, promoting societal stability and cohesion (Carrilho, & Trindade, 2022).



- Regulations that address climate adaptation and mitigation in peri-urban areas are the focus of resilient measures. The incorporation of climatic factors into urban planning procedures, as well as regulations for energy-efficient infrastructure, water conservation efforts, and sustainable land use practices, are a few examples. Such actions help settlements be more resilient to the effects of climate change (Mitchell et al. 2021).
- Collaboration with formal and informal institutions: Effective resilience-building strategies necessitate cooperation and compromise with a variety of formal and informal organizations and stakeholders. To establish and implement rules that are broadly accepted and contextually relevant, this may entail collaborating with local government agencies, community organizations, businesses, and civil society (Carrilho, & Trindade, 2022).

Systematic planning and capacity-building are also required to lower disaster risk and increase community resilience to increasingly catastrophic events such as droughts and floods (International Monetary Fund, 2020). Big data, econometric analysis, and event studies can be used as a measure to provide an overview of how climate change affects Namibia, with a focus on the implications for economic growth and inequality in both rural and urban settings. Climate change is threatening the food security of the poor in both rural and urban areas. Reducing this risk calls for enhancing the resilience of agricultural production and households, which can be accomplished partially by prioritizing the necessary measures in government budgets as well as improved collaboration between line ministries (Finance, Agriculture, Education, Environment, and Health) and development partners.

## **6. CONCLUSION**

In summary, addressing the complexity and difficulties involved in the regularization and formalization of land, these actions hope to increase community resilience and advance sustainable development. These approaches illustrate the necessity for a comprehensive and flexible approach to regulation in peri-urban informal settlements, understanding the details and motivations driving their existence. Resilient practices attempt to solve obstacles and impediments while encouraging sustainability, social cohesion, and environmental awareness. Through implementing these resilient measures into peri-urban regulatory processes, policymakers and stakeholders can work to improve sustainability, living conditions, and the resilience of these settlements. The continued growth of peri-urban areas leads to more climate vulnerability in such spaces while local authorities turn a blind eye.

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