



UDC 332; DOI 10.18551/rjoas.2023-12.19

THE USE OF INDIGENOUS AND INNOVATIVE ADAPTATION PRACTICES TO SUSTAIN HOUSEHOLD FOOD SECURITY IN SOUTH AFRICAN RURAL COMMUNITIES: A GENDER PERSPECTIVE

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ABSTRACT

Climate change is responsible for the depletion of local food resources procured mostly by women to fulfill household food requirements. Food insecurity because of erratic rainfall and rising temperatures negatively affected household food security practices. Nonetheless, women employ their traditional and alternative methods of adaptation to guarantee the accessibility and availability of food resources. This study elucidates the endeavors undertaken by women residing in the rural areas of Limpopo Province, South Africa to guarantee household food security. The research employed semi-structured interviews as a methodological approach to elucidate the dynamics of shifting climatic patterns that exert adverse effects on subsistence food production. Additionally, the study aimed to investigate the strategies employed by women to mitigate food insecurity in the face of these challenges. The study findings indicate that climate change is primarily characterized by unpredictable rainfall patterns and increasing temperatures, which are identified as the main factors contributing to reduced agricultural productivity in subsistence crops. Women have a crucial role in ensuring household food security by engaging in home gardening and participating in stockvels as providers of food within the households. The farming practices adopted by the women could be encouraged and supported by the local agricultural extension officers for a wider practice. The stockvels represent innovative technologies adopted by the women to ensure food insecurity. The integration of gender considerations into climate change adaptation plans has the potential to facilitate the implementation of efficient and economical capacity-building initiatives and adaptive solutions.

KEY WORDS

Climate change, gender, indigenous adaptation practices, innovative adaptation practices, food security.

The worldwide environment is currently in a vulnerable position due to highly unpredictable weather patterns, leading to climate fluctuations and alterations. Climate variability and change scenarios are widely acknowledged by governments and scientists as a substantial environmental, social, and economic threat. This issue has been observed over time and is currently posing a significant challenge to the sustainable development of rural communities (Nnadi et al., 2019). The impact of this phenomenon on the livelihoods of rural communities has been found to be significant (Nnadi et al., 2019), hence posing a significant obstacle to the achievement of Sustainable Development Goals (SDGs) (Ume et al., 2021). Odimegwu (2022) shows that the agricultural sector is expected to experience detrimental effects from environmental change, which will have negative consequences for both livelihoods and food security. Karienyé and Macharia (2021) purport that climate variability is a prominent natural hazard that significantly contributes to food insecurity in developing countries, particularly in Africa. Additionally, Odimegwu (2022) concedes that the expected negative consequences encompass diminished agricultural productivity and a reduction in the level of food security at the household level. The impact of climate change on the livelihoods of small-



scale farmers in South Africa is anticipated to be significant. This is mostly attributed to their heavy reliance on rain-fed agriculture, as highlighted by Olabanji et al. (2021). The significance of South Africa's agriculture lies in its contribution to the nation's food security and economy, since it supports over 70% of the region's food supply, income generation, and employment opportunities (Cammarano et al., 2020). Hence, it is imperative to comprehend the capacity of subsistence farmers to facilitate efficient adaptation planning to ensure sustainable production of agricultural food crops (Odimegwu, 2022).

There is a dearth of literature about the roles assumed by women in the realms of climate change adaptation and mitigation in South Africa. There is sparse evidence to show the women's dedication to coping with the negative impacts of erratic rainfall on household food provision mechanisms, the alternative practices they have adopted to cope with the change, as well as the importance of gender mainstreaming in climate change adaptation. However, it is imperative to comprehend climate change as a human-induced phenomenon and any proposed solution designed to tackle its complexities must acknowledge the role of ordinary people as active participants and contributors (Fonjong, 2008). Furthermore, it is imperative to examine climate change from a gender perspective, as suggested by Alston and Pardey (2014). The basis for this suggestion is derived from empirical evidence indicating that most smallholder farm labourers in Africa are women (Fonjong, 2008). Cannon (2002) and Klinenberg (2002) concede that the adverse consequences of climate change will disproportionately affect socioeconomically disadvantaged individuals, the elderly, the young, marginalized populations, indigenous communities, and immigrants, with the added dimension of gender influencing the extent of these impacts. An additional incentive stems from the inherent connection between women and the environment, since their ability to fulfil their reproductive, productive, and community responsibilities is intricately linked to the state of the ecosystem (Ajani et al., 2013). Consequently, the female population is rendered more susceptible to the repercussions of climate change due to their predominant representation among the impoverished and their heightened reliance on natural resources for sustenance, which are imperiled by the impacts of climate change (Rankoana, 2021). It is therefore imperative to investigate the various forms of adaptation strategies employed by women to ensure food security at the household level as a result of sporadic droughts, rising temperatures, and unpredictable seasonal patterns.

This research elucidates the adaptation initiatives undertaken by women residing in a rural community of Limpopo Province, South Africa, in order to mitigate household food insecurity.

METHODS OF RESEARCH

The research was carried out in Mogalakwena community. The community is situated inside the administrative boundaries of the Mogalakwena Local Municipality, which is located in the Waterberg District Municipality. The municipality possesses a land area measuring 6,200 square kilometres, accounting for 12% of the whole area of the Waterberg District. The area exhibits a varied socio-demographic composition, which is characterised by a range of geographical and physical attributes that are evident in every facet of the area's growth and progress. Mogalakwena primarily serves as the intermediary connecting the Waterberg District and the Capricorn District Municipalities. It is geographically encompassed by the predominantly remote rural areas of Lephalale Local Municipality to the north and west. The city of Polokwane and Blouberg Local Municipalities are situated to the east, while Mookgophong and Modimolle Local Municipalities are located to the south. The Mogalakwena community is situated inside the Rebone municipal region, specifically along the R518 and N11 routes. According to the Mogalakwena Local Municipality Integrated Development Plan (IDP) for the period 2022/23–2026/27, the N1, N11, and R518 roadways, in conjunction with the Mogalakwena River and surrounding mountains, have played a significant role in shaping the development of the municipal area. Additionally, the area's rich history, cultural diversity, and physical resource



base, particularly in relation to agriculture and mining, have also influenced the patterns that drive development within the municipality (IDP, 2022/23–2026/27).

The topography is intersected by secondary drainage lines, which predominantly follow valleys in a northward direction. There is a noticeable decrease in elevation when moving southward from the central plateau towards the Springbok Flats. These flats span from the adjacent Bela-Bela Local Municipality to the northern region of Mokopane. In the northern region, the topography transitions into an undulating landscape that gradually descends towards the Limpopo Valley. Conversely, flat plains are prevalent in the western areas (IDP 2022/23–2026/27). Temperature and precipitation are crucial climatic variables that are essential for maintaining the physical environment and exert a substantial influence on the biotic ecology of a given region. The area is situated in the summer rainfall region of Limpopo, where the period of precipitation typically spans from November to March. The mean annual precipitation ranges from 600 to 650 millimeters. The months of January and December get the greatest amount of precipitation. There is a decreasing trend in average rainfall as one moves from east to west. Thunderstorms with hail and fog are most frequent. The region encounters a hot and semi-arid climatic condition. During the months of October and March, summer days exhibit high temperatures ranging from 28°C to 34°C. The nocturnal temperatures throughout the summer season exhibit a range of temperatures, spanning from warm to moderate, with values fluctuating between 16°C and 21°C. During the months of April and September, the winter day temperatures exhibit a range of 19.6°C to 25.2°C, characterized by a mild to warm climate. During winter, nocturnal temperatures range from 4.3°C to 12.1°C. There are abnormal fluctuations in temperature and rainfall, leading to a rise in the occurrence and severity of drought. These climatic changes have had significant and enduring consequences on the sustainability and efficiency of subsistence agriculture within rural communities (IDP 2022/23–2026/27).

The studied community exhibits a pattern of settlement characterised by the clustering of houses into blocks. This arrangement serves the purpose of facilitating effective planning and the supply of essential household infrastructure (Statistics South Africa, 2017). Out of the total population of 78,647, individuals aged 20 years and above, 18.2% have attained primary education, 35.6% have obtained secondary education, 21.7% have successfully finished matriculation, 8.5% possess some level of higher education, and 16% lack any form of formal schooling (IDP 2022/23–2026/27). The unemployment rate (40.2%) in Mogalakwena has an almost twofold disparity in comparison to the other municipalities within the district. The observed phenomenon can be ascribed to a decline in mining operations throughout the past few years. According to Statistics South Africa (2017), a significant proportion of women who are now unemployed contribute to household sustenance by cultivating subsistence crops in their home gardens. The primary economic activity observed is subsistence crop farming, which serves to reinforce the prevailing traditional roles and responsibilities of women in acquiring sustenance and water resources (IDP, 2022/23–2026/27). The water supply for people of the Mogalakwena community relies heavily on boreholes. Many boreholes are under private ownership by individual families. The water levels in boreholes are typically shallow, and on occasion, the water may exhibit the presence of rust particles. Water pollution has a significant detrimental effect on the quality of borehole water, leading to the contamination of groundwater (IDP, 2022/23–2026/27).

A qualitative study was conducted to examine the measures implemented by women to mitigate food insecurity within their households. The population under study consisted of the females residing in the Mogalakwena community. A purposively selected sample consisted of 67 households. The selection criterion was based on age, specifically limited to the women aged 30 years and above. Another criterion considered was the inclusion of women, who bear the responsibility of fulfilling their household needs, including the provision of food.



The data utilized in this study were acquired from primary sources. The data were obtained by engaging in direct interactions with the women who were responsible for the provision of food in their own households. The research employed semi-structured interviews. The data was documented in both written and audio formats. The data were transcribed in order to assist the process of qualitative analysis. The data was subjected to a thematic content analysis, wherein common themes and issues were identified, along with the identification of repeating and contradicting themes, based on the responses.

RESULTS AND DISCUSSION

Among the sample of 67 women, a significant proportion of them, specifically 61%, were found to be within the age range of 30 to 50 whereas 39% were within the age bracket of 60 to 72. The percentage of women lacking formal education was lower, namely at 2%. Most of the women, comprising 45% of the sample, achieved a Grade 12 level of education. The majority (76%) stayed in the households consisting of 1 to 3 individuals, whereas a smaller proportion (24%) was in households with 4 to 12 members. Approximately 54% of women relied on social grants as well as a monthly salary exceeding R1500 as sources of household income. A total of 62% of women relied on income obtained from alternative sources. Many women, approximately 99%, reside in contemporary brick dwellings, while smaller proportions inhabit huts and shacks.

Table 1 – Efforts to ensure household food security

Themes	Practices	Sustainability
Subsistence agricultural production	Home gardening	Use of blended practices
	Indigenous crop production Vegetable production	Indigenous production systems
Alternative food sources	Stockvels Affiliation to women clubs	Monthly contribution of money

Of the women, 48 reported:

“The utilization of kraal manure, garden residue, and kitchen waste enhances soil fertility and augment agricultural productivity. The components are incorporated into the soil and irrigated to enhance both soil fertility and moisture levels.”

Responses from all women were that:

“The cultivation of crops often begins following the initial rainfall. Over the course of the previous decade and a half, our region experienced enough precipitation, which facilitated the cultivation of home gardens. Considering the erratic precipitation patterns observed in the recent period, our household gardens have yielded crops such as millet, beans, and melons. These crops have been chosen due to their characteristics of being short-season and exhibiting resilience to drought conditions. The seeds of the crops obtained from the previous harvest are sown, however on occasion millet, nuts, and melon seeds are procured from retailers. The seeds are combined in a single receptacle and subsequently distributed uniformly throughout the entirety of the garden. This planting pattern facilitates the concurrent growth of all crops in the gardens, hence optimizing production for the provision of vegetables, fruits, and other agricultural products.”

The most common preservation practice reported by the women is the sun-drying of the beans, nuts, and vegetables to preserve the materials for future use. The women reported:

“We collect the fresh, tender leaves of Vigna sinensis, Citrullus, and Cucurbita pepo and put them in the sun to dry off. This process makes it easy for us to preserve them for future use. Sometimes the cooked leaves are spread on the steel sheets and put in the sun to dry. The dried materials are stored in plastic bags and buckets. The seeds of millet, nuts, and beans are



mixed with the ash of sekgopha (Aloe ferrox) for prevention against weevils. The seeds could be stored for up to three years.”

The women employ several strategies to safeguard household food security, which involve adaptive measures to enhance resilience in the face of adverse effects of climate change on subsistence crop cultivation. According to Ajani et al. (2013), the women in this context assume the role of change agents and significant contributors in the formulation and implementation of an efficient strategy to address climate change, with a particular focus on food security. The acquisition of information necessary for maintaining household food security through subsistence crop production is regarded as traditional and local knowledge, which plays a crucial role in adapting to the effects of climate change (Ajani et al., 2013). The adoption and implementation of adaptation techniques may significantly influence the behavioural changes of women, whose individual decisions might have substantial collective consequences.

According to Joala (2013), food insecurity is perceived as a household-level failure in sustaining livelihoods, rather than a failure of national-level food production. Considering the adverse effects of climate change on subsistence crop production, the adoption of indigenous or household level adaptation measures is becoming more recognized as an imperative for enhancing crop productivity, ensuring food security, and safeguarding livelihoods (Akanbi et al., 2021; Olabanji et al., 2021). The ability of subsistence farmers in Africa to cope with and minimise the impacts of climate variability has been widely recognized, as evidenced by their utilisation of strategies like shifting cultivation and mulching (Ajani et al., 2013). According to Cammarano et al. (2020), the observed effects of temperature and precipitation changes on subsistence agricultural production have led to the implementation of several adaptation strategies. Among these strategies, the most frequently employed ones include the utilization of improved seeds, the application of chemical fertilizers, and the adjustment of planting schedules.

The production of exotic veggies and the association with local women's food clubs were observed. In conjunction with enhanced agricultural productivity, women allocated sections of their domestic gardens for cultivating exotic vegetables, such as spinach, tomato, beetroot, carrot, cabbage, onion, and sweet potato, as supplementary means of sustenance. The implementation of alternative crop cultivation is an adaptation strategy largely focused on enhancing agricultural productivity by cultivating crops that are resilient to drought and high temperatures. FAO (2011) supports the implementation of this food security practice, asserting that women maintain a crucial position in agricultural growth and food security within developing countries, despite the obstacles posed by climate change, such as increasing temperatures and unpredictable precipitation patterns. Ufuoku (2011) supports the notion that effective adaptation to climate change necessitates farmers' recognition of the altered climate conditions and their subsequent identification and implementation of non-indigenous adaptation solutions. Numerous proposals have been put out regarding treatments aimed at enhancing the adaptive and mitigative potential of local populations in which case adaptive mechanisms tend to be hierarchical and limited to the perspectives of individuals within the local community (FAO, 2011).

One other unique practice involved establishing partnerships with local women's food clubs. Membership in these clubs, where a range of five to 25 women engage in a collective agreement to regularly contribute a predetermined sum of money into a shared fund on a weekly, biweekly, or monthly basis, was regarded as a food security measure. The projected monthly contribution ranges from R50 (\$5) to R100 (\$10), encompassing a frequency that falls between weekly and fortnightly intervals. The funds are placed into a communal bank account that is officially registered under the club's name. At the commencement of the holiday season, typically in early November, the funds are withdrawn and utilized for the purpose of purchasing food items in large quantities. These items are thereafter divided evenly among the members of the club. The objective is to establish a stockpile of food items, often those with a longer shelf



life, with the intention of sustaining oneself for around six months. This form of food security enabled the women to effectively manage household food procurement crises and effectively respond to future challenges, hence mitigating the risk of food insecurity. The FAO (2011) report provides support for the implementation of this food security practice, since it highlights the prevalence of food insecurity among rural households in many developing nations, resulting in their inability to adequately fulfill their daily nutritional requirements.

Nevertheless, the fulfillment of household food requirements is achieved by participating in various informal endeavors aimed at broadening income and food options in order to mitigate the risks associated with poverty and food insecurity (FAO, 2011). According to Karienyne and Macharia (2021), it is acknowledged that the anticipated rise in global temperature, which is expected to lead to an escalation in global warming, necessitates individuals and groups to seek adaptive strategies that ensure their survival. For Lukhele (1990) and Irving (2005), stokvels are collective savings initiatives that aim to foster both financial and mutual well-being, while also addressing economic, social, and recreational requirements. These mechanisms provide individuals with insurance coverage against unforeseen circumstances, particularly in terms of food provision, and empower them with the financial resources to support other agreed-upon activities within the stokvel as a collective. This may include granting loans to members in need (Townsend & Mosala, 2009). The women first engaged in informal operations, but they have since established a system for saving and managing the acquired funds. This system has gained recognition from the financial sector (Calvin & Coetzee, 2010; Mphahlele, 2011).

CONCLUSION

This study provides an examination of data pertaining to the adaption practices employed by women in a rural community located in the Limpopo Province of South Africa, with the aim of addressing household food insecurity. The findings demonstrate the strategies implemented to enhance and maintain subsistence crop production for household consumption. This practice is not reliable as it is climate-reliant. The current dependence on agricultural production is insufficient to meet the household food requirements. Consequently, the women have adopted the cultivation of exotic vegetables and have joined women's food clubs to secure household food security. The utilization of a combination of indigenous and new adaptation practices is implemented with the aim of optimizing the availability and dependability of food resources to reduce the chances of poverty and hunger.

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