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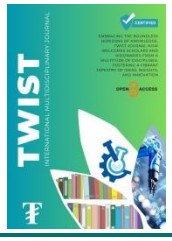

Socio-Economic Implications of Domestic Water Collection for Women and Children in Rural Areas of South Africa

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Abstract
Access to safe and reliable water remains a persistent challenge in many rural communities of South Africa, with far-reaching socio-economic and health implications, particularly for women and children. The study investigated the socio-economic implications of domestic water collection for women and children in a rural Eastern Cape municipality in South Africa. The research addresses the disproportionate burden of water collection on these vulnerable groups and the resulting negative impacts on their time and well-being. The study was supported by Sustainable Livelihoods Framework. The study was underpinned by a quantitative descriptive survey design, data were collected from 282 households to analyse the time burden of water collection and identify who is primarily responsible for the task. Data was analysed using Statistical Package for the Social Sciences (SPSS) and Micro-Soft Excell was used to draw graphs and table. The findings reveal that a significant majority of households (98.2%) spend 30 minutes and more to collect water, with 61.3% of households being located within a 30-minute walk from a water source, while 36.9% spend between 30 minutes to 1 hour, and a small minority spend up to 2 hours. The study concludes that the significant and disproportionate burden of domestic water collection on women and children in rural areas. The study concludes with a call for targeted interventions to alleviate this burden and improve the socio-economic and health outcomes of women and children in rural South Africa. The study implements Community-Based Water Infrastructure Projects to alleviate the socio-economic burdens on women and children. Rural development programs could prioritise the establishment of accessible and reliable water sources within close proximity to households.

Keywords
domestic water, reliable water, water access, water collection

INTRODUCTION

Domestic water collection remains a critical challenge in many rural and peri-urban communities across sub-Saharan Africa, including South Africa. Despite global progress in water infrastructure, millions of households still lack access to safe and conveniently located water sources, compelling family members, primarily women and children, to spend significant time and effort fetching water for daily needs. This burden is not only a matter of physical labour but also has far-reaching socio-economic and health implications. In sub-Saharan Africa, over two-thirds of households must leave their homes to collect water, with women and girls overwhelmingly responsible for this task (Apatinga et al., 2024). The time spent on water collection can range from less than 30 minutes to several hours per day, depending on the proximity and reliability of water sources (Apatinga et al., 2024; Oskam et al., 2021). In South Africa, as in many other countries, this responsibility often falls to mothers and children, who may carry heavy loads over long distances, typically transporting water by head-loading or using basic tools such as buckets and wheelbarrows (Oskam et al., 2021). The

feminisation of water collection is deeply rooted in cultural and social norms, reinforcing gender roles and limiting women's participation in education, income-generating activities, and community decision-making(Sahoo & Rath, 2025). Children, especially girls, are also affected, as water collection duties can interfere with school attendance, academic performance, and overall well-being (Apatinga et al., 2024). Furthermore, the physical demands and risks associated with water collection, such as musculoskeletal injuries, exposure to violence, and reduced personal hygiene, compound the vulnerability of women and children (Gomo et al., 2025; Mukiese et al., 2024). By highlighting the gendered and generational dimensions of water access, the article aims to inform policy interventions that can alleviate the burden on women and children, promote gender equality, and enhance community well-being.

The study was guided by these research question;

1. What is the role of women and children in water collection tasks in rural households within the Eastern Cape Local Municipality?
2. How does the time burden associated with water collection affect household routines, particularly for women and children?

LITERATURE REVIEW

The Role of Women and Children in Water Collection

The responsibility for water collection in rural South Africa unduly falls on women and children, especially girls (Apatinga et al., 2024). Research consistently shows that adult women are the primary water collectors in most households, with female children more likely than male children to be tasked with this labour (Gomo et al., 2025). This gendered division of labour is a widespread phenomenon in the region, with studies pointing to the significant time and physical effort this task demands from women and children (Apatinga et al., 2024; Sahoo & Rath, 2025). Consequently, municipalities must prioritise the safety of women and children in their efforts to meet Sustainable Development Goal 6 (SDG 6) for universal water access (Water et al., 2018).

Time Burden Associated with Water Collection

The time burden of water collection significantly disrupts household routines and negatively impacts women and children (Tshona et al., 2025). Studies reveal that when water sources are more than 30 minutes away, the burden of collection increases, affecting both the quantity of water collected and the time available for other essential activities (Apatinga et al., 2024; Saha et al., 2025). This is particularly challenging in many rural South African communities where households rely on distant water sources like rivers and streams, often exceeding the 30-minute threshold recommended by WHO and UNICEF (Oskam et al., 2021; Sahoo & Rath, 2025). For children, particularly girls, this time burden is directly linked to reduced school attendance, fatigue, and diminished academic performance, with some spending an average of 19.5 hours per week on domestic chores, with water collection being the most time-consuming (Gomo et al., 2025; Mukiese et al., 2024). This time-consuming task also limits women's opportunities for income-generating activities, community participation, and personal well-being (Sahoo & Rath, 2025). Limited access to nearby water sources is also linked to adverse health outcomes, especially among children, highlighting the public health implications of the time and effort spent on water collection (Rhue et al., 2023). Therefore, addressing the time burden of water collection is essential for improving the socio-economic well-being of women and children in these communities.

THEORETICAL FRAMEWORK

The Sustainable Livelihoods Framework (SLF) was initially developed by the United Kingdom (UK) Department for International Development (DFID) in the late 1990s, with the framework formally published in 1999 (Morse, 2025). SLF, thus, is a suitable theoretical framework for this study since it emphasises the multidimensional aspects of livelihoods, including social, economic and environmental factors. Thus, SLF will help clarify the vulnerability of households, especially women and children, to water collection.

METHODOLOGY

Research Approach

The study adopted a quantitative descriptive survey design to systematically collect data from women and children in rural households within a selected local municipality in the Eastern Cape (Apatinga et al., 2024). The approach was chosen because it enables the collection of structured, measurable data from a large population, allowing for statistical analysis to identify patterns, trends, and relationships. The design is particularly suitable for this topic as it provides a clear understanding of the extent of the water collection burden, the roles of different household members, and the associated socio-economic and health implications, thereby supporting evidence-based recommendations for policy and infrastructure development (Apatinga et al., 2024).

Population and Sampling

The target population includes women and children residing in rural households of the municipality who are primarily responsible for fetching water. A probability sampling technique, specifically simple random sampling, will be used to select a representative sample size (Obilor, 2023). The sample size will be calculated using standard formulae for

descriptive studies to ensure statistical significance (Obilor, 2023). A structured questionnaire was developed based on literature and tailored to capture key variables including time spent fetching water, frequency and distances travelled, physical impacts and educational attendance patterns of children. In this study, a structured questionnaire was adopted (Almulhim & Abubakar, 2024).

Data Collection

The study, a descriptive survey design was employed to collect comprehensive data on the socio-economic implications of domestic water collection for women and children in rural areas (Lapan et al., 2011). The descriptive survey approach allowed for the systematic gathering of detailed information from a representative sample of households within the Eastern Cape Local Municipality (Lewthwaite & Nind, 2016). Data were collected using structured questionnaires specifically designed to capture quantitative and qualitative information about the roles of women and children in water collection, the time spent on these tasks, and the subsequent effects on household routines and socio-economic conditions (Lim, 2020). Trained field researchers administered the questionnaires through face-to-face interviews, ensuring clarity and accuracy in responses, particularly given the rural context (Lim, 2024). The descriptive survey design facilitated the collection of a wide range of variables that describe the water collection experiences and related socio-economic factors (Mantula et al., 2024). The method enabled the researchers to paint a clear picture of the challenges faced by the target group and provided empirical evidence vital for informed decision-making and policy development (Montgomery, 2011).

Data Analysis

Data were entered into SPSS and Excel for analysis. The collected data were coded, cleaned, and analysed using IBM SPSS Statistics Version 27; Excel was utilised for tables and graphs. Hence, descriptive statistics, frequencies, and percentages were employed to determine the proximity to water sources and the responsibility to collect water (Saha et al., 2025).

Ethical Considerations

The research adhered to all ethical standards. No personally identifiable information was collected, and data were used solely for academic purposes, ensuring confidentiality and ethical integrity throughout the research process. The ethical clearance was obtained from the Faculty Research Ethics Committee (Wolde et al., 2022).

FINDINGS AND DISCUSSION

Table 1 Proximity to Water Sources

Questions		Frequencies	Percentage
How long does it take for you to get to your water source?	Less than 30minutes	173	61.3
	30 minutes to 1 hour	104	36.9
	1 hour to 2 hours	5	1.8
	Total	282	100.0
Who usually goes to fetch the water for your household?	Mother	148	52.5
	Children	131	46.5
	Other	3	1.1
	Total	282	100.0
How do you bring the water to the household?	Head (Bucket)	229	81.2
	Wheelbarrow	47	16.7
	Cattle drawn	3	1.1
	Other	3	1.1
	Total	282	100.0

Table 1: The graph revealed key insights into water collection practices among households surveyed. A majority of respondents (61.3%) reported that it takes less than 30 minutes to reach their water source, while 36.9% take between 30 minutes to 1 hour, and a small minority of 1.8% spend between 1 to 2 hours fetching water. Regarding who undertakes the water collection, mothers are the primary collectors in 52.5% of households, closely followed by children at 46.5%, with only 1.1% being others. In terms of transporting the water, most households (81.2%) carry water on their heads using a bucket, indicating a traditional method of transport. A smaller portion (16.7%) use wheelbarrows, and very few (1.1%) rely on cattle-drawn methods or other means. These findings highlight the significant physical effort involved in water collection and the central role played by women and children in this daily task within these communities.

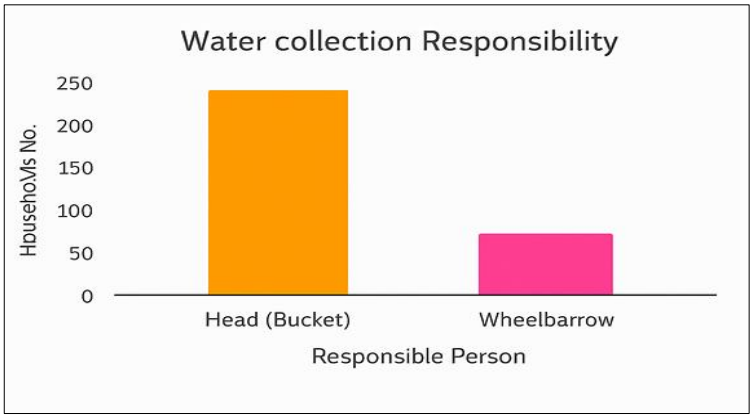

Fig. 1 Water Collection Responsibility

Figure 1: The graph presents data on the methods used for water collection and the primary responsibility for transporting water in households. It shows that the majority of households rely on carrying water on their heads using buckets, with approximately 230 households adopting this method. In contrast, a significantly smaller number of households, around 50, utilize wheelbarrows to transport water. This indicates that the traditional method of carrying water on the head is still the predominant practice in the surveyed community. The lesser use of wheelbarrows suggests limited access to or availability of alternative transportation tools for water collection. This reliance on head-carrying methods highlights the considerable physical effort required from individuals, mainly women and children, who are usually responsible for this task. The data points to the need for interventions that could introduce or improve access to easier water transport options to reduce the physical burden on those responsible for water collection.

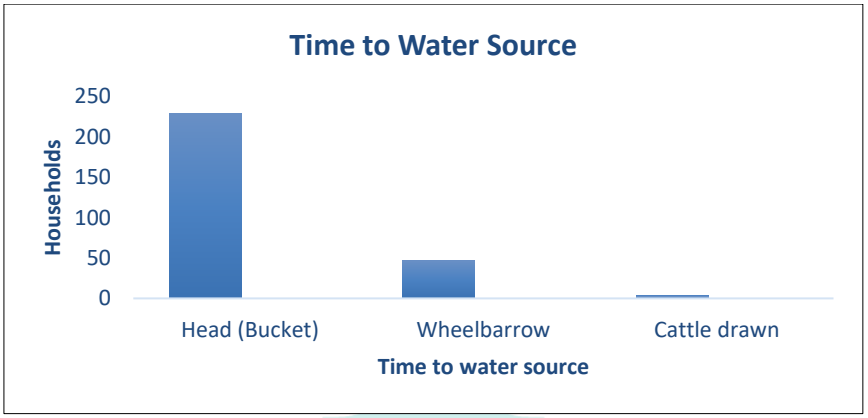

Fig. 2 Time to Water Source

Figure 2: The majority of households use the head (bucket) method, with over 230 households relying on this mode, followed by a significantly smaller number using wheelbarrows, and very few using cattle-drawn means.The distribution indicates that the head-carrying bucket method dominates water collection practices. The minimal use of wheelbarrows and cattle-drawn methods suggests limited access to alternative transport options. The data highlights the physical labor endured by households, mainly women and children, in water collection duties.

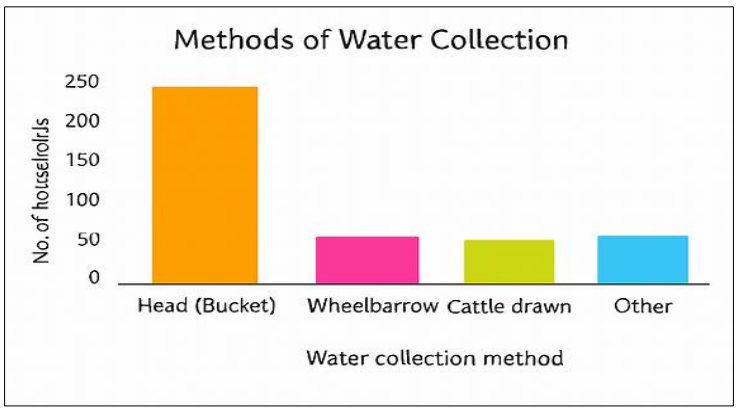

Fig. 3 Methods of Water Collection

Figure 3: The majority of households use the head (bucket) method, with over 230 households relying on this mode, followed by a significantly smaller number using wheelbarrows, and very few using cattle-drawn means. The distribution

indicates that the head-carrying bucket method dominates water collection practices. The minimal use of wheelbarrows and cattle-drawn methods suggests limited access to alternative transport options. The data highlights the physical labour endured by households, mainly women and children, in water collection duties.

Role of Women and Children in Water Collection

The data show that mothers (52.5%) and children (46.5%) are almost equally responsible for fetching water, with very few households relying on others (1.1%). This aligns with broader sub-Saharan African trends, where women and girls overwhelmingly bear the responsibility for water collection, especially when sources are distant or unreliable (Nyika & Dinka, 2023). The high involvement of children, particularly girls, in water collection is well-documented in South Africa and is associated with negative impacts on their education, health, and overall well-being (Rhue et al., 2023).

Time Burden and Household Routines

A significant proportion of households (38.7%) spend more than 30 minutes per trip to collect water, with a small but notable group (1.8%) spending up to two hours. This time burden is substantial, as international and local research indicates that water collection times exceeding 30 minutes are linked to increased physical strain, reduced time for schooling and income-generating activities, and heightened exposure to health risks (Gomo et al., 2025). The majority of respondents (81.2%) The majority of respondents (81.2%) carry water on their heads, a method associated with musculoskeletal injuries and long-term health consequences (Mukiese et al., 2024).

Socio-Economic Impacts

The reliance on women and children for water collection perpetuates gender and age-based inequalities. For women, the time and physical effort required for water collection limit opportunities for economic participation and community engagement (Nyika & Dinka, 2023; Obilor, 2023). For children, especially girls, the burden of water collection often leads to absenteeism and poor academic performance, reinforcing cycles of poverty and limiting future prospects(Rhue et al., 2023). Furthermore, the lack of reliable and proximate water sources exacerbates vulnerability to climate change and socio-economic marginalisation in the Eastern Cape (Nyika & Dinka, 2023; Water et al., 2018).

Policy and Practical Implications

These findings underscore the urgent need for integrated, gender-sensitive water policies and infrastructure investments in rural South Africa (Platform & Joshi, 2024). Addressing the time and labour burden of water collection can improve educational outcomes for children, enhance women's economic opportunities, and reduce health risks, thereby contributing to broader social and economic development goals (Haddout et al., 2024).

CONCLUSION

The study concludes that the significant and disproportionate burden of domestic water collection on women and children in rural South Africa, as evidenced by the findings from the Eastern Cape municipality. The data demonstrates that most households spend a considerable amount of time fetching water, a task that falls almost exclusively on mothers and children. The reliance on physically demanding methods, including head-loading, highlights the immense physical strain and socio-economic vulnerability imposed by this daily chore. This aligns with the Sustainable Livelihoods Framework, which underscores how limited access to a vital asset like water can undermine overall household well-being and restrict opportunities for human development. Ultimately, the study underlines that addressing this issue is not merely about providing infrastructure but promoting gender equality, safeguarding children's education, and enhancing the health and economic prospects of the entire community.

RECOMMENDATIONS

Based on these findings, it is recommended that local municipalities and government agencies implement targeted interventions to alleviate the water collection burden. First, there should be an urgent acceleration of water infrastructure development, including the installation of more accessible communal taps and borehole systems within closer proximity to households. Second, educational awareness campaigns should be launched to raise awareness about the negative impacts of water collection on children's schooling and health, encouraging a more equitable distribution of domestic chores within households. Third, specific support programs, such as subsidised water transportation services or water storage tanks, should be introduced to reduce the physical labour required. Finally, future research should explore the effectiveness of these interventions and their long-term impact on the socio-economic indicators of women and children in these communities.

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