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COMMUNITY DEVELOPMENT PARADIGMS: THE BHAHUMONO AGE-GRADE PERSPECTIVE*

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Abstract. Government-led socio-economic initiatives and infrastructural development have frequently fallen short in many developing economies, especially in rural areas. This persistent failure has resulted in widespread poverty, inadequate infrastructure, and limited access to essential services, forcing grassroots communities to adopt or re-engage with traditional mechanisms for sustainable development. The nine communities in the Bhahumono tribe share a comparable experiential trajectory. This qualitative case study, grounded in the place-building theory, examines how the age-grade system has been leveraged to mobilise financial resources for Indigenous community infrastructural projects in the face of civic misgovernance in post-colonial Africa, using Usumutong, one of the Bhahumono's communities, as a reference point. The findings highlight the resilience of rural communities in devising self-sustaining development models and how critical it is to integrate Indigenous knowledge systems to achieve comprehensive and lasting socio-economic progress.

Keywords: Age-grade system; community resilience; finance mobilisation; ill governance; inclusive economic development

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JEL Classifications: I31, A14, Q01

1. Introduction

Before slavery and colonialism, African communities were deeply rooted in communal systems that prioritised collective resource mobilisation for the common well-being of the people and their societies (Rodney, 1972). In this era, these societies function on principles of shared resources, mutual aid, and a strong sense of social responsibility. Their cultural orientation centred around contributing to building society rather than extracting from it, fostering a spirit of inclusivity and interdependence (Kanu, 2017; Curran, 2020; Mabele, Krauss & Kiwango, 2022). This social orientation allowed African communities to build progressive economies that were resilient and adaptive to environmental and social changes. Consequently, the intrusion of Western powers through slavery and colonialism caused a significant shift and disruption to these indigenous systems and practices. The imposition of foreign ideologies and economic structures initiated a dependency syndrome

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antithetical to previously existing self-sustaining models (Ali, Fjeldstad & Shifa, 2020). The colonialists introduced and implemented systems of resource exploitation and extraction, prioritising their interests over the well-being of the local African populations. The intrusion resulted in the dismantling of traditional African governance structures and economic systems, replacing them with hierarchical and segregated models designed to maintain colonial supremacy and local communities' dependency. Subsequently, the Western hegemony entrenched economic inequalities and fostered a dependency on foreign aid and imported goods, undermining African societies' capacity to develop.

Colonialism, a system that began in the 15th century, continues to impact and decimate Africa's economies in the 21st century. Many post-colonial African states still grapple with the challenges of economic dependency even after independence, with their economies heavily reliant on the export of raw materials that could potentially enhance growth if refined domestically, while importing finished goods that can also be produced locally (Bjornlund, Bjornlund & van Rooyen, 2022). This colonial dependency has perpetuated a cycle of poverty and underdevelopment of the people and their communities, making it difficult for African nations to harness their resources for the benefit of their populations fully. Beyond economic implications,

Western intrusions-imposed alien cultural values and orientations on Africa, gradually erasing its indigenous practices that once underpinned community resilience and sustainability (Arowolo, 2024). As these traditional African systems falter, and instances of poor governance by the systems that have replaced them in the political spheres and within democratic frameworks, there is a growing concern and recognition of the need to revalorise and integrate indigenous African knowledge systems and traditional economic models into contemporary development strategies to rejuvenate societies. This shift can create more inclusive and resilient economies that better reflect the needs and values of African societies.

In the context of the arguments above, this study examines one of Africa's Indigenous systems harnessed in the pre-colonial era for local economic sustainability. It delves into the age-grade system as an Indigenous African resource mobilisation mechanism for community development and economic resilience. Examining the role of age-grade structures in mobilising resources for sustainable local economies and stability, the study provides valuable insights into self-sustenance strategies in the face of national governance failures. This renewed focus on Indigenous practices offers practical avenues for distilling learning points that can be applied to modern challenges in anticipation of fostering greater community self-reliance and resilience amidst contemporary governance's shortcomings.

The subsequent sections present theoretical discourse of contemporary issues around misgovernance, community resilience in the face of misgovernance, the age-grade system, as well as the conceptual framework which aids understanding of how community structures, such as the age-grade system, individually, can mobilise financial resources to bolster development. In addition, the methodology employed is presented, followed by discussions based on the key findings. The results are twofold: the first relates to age-grade capital mobilisation avenues, while the second phase pertains to community infrastructural development projects initiated by age-grade systems. The conclusion and key recommendations derived from the findings are provided in the final sections.

2. Misgovernance, a Contemporary Menace

The 21st century ushered in a rise in civic protest, reflecting growing public demand for reforms globally. This upsurge in protests frequently manifests amid widespread misgovernance, lack of social justice and political accountability, especially in governmental institutions (Ortiz, Burke, Berrada & Saenz Cortés, 2022; Leach, Ferguson & Teixeira, 2024). As governments increasingly fail to meet the basic needs of their citizens, such as education, healthcare, employment opportunities and security, public frustration has intensified, resulting in mass mobilisations and protests. This pattern is not isolated to a specific country or continent but is a global phenomenon with deep-rooted causes, mainly due to mismanagement, social inequality, and corruption. The Arab Spring, for instance, which began in 2010, was predominantly motivated by widespread dissatisfaction with authoritarian regimes and bribery across the Middle East and North African regions (Jha & Kırşanlı, 2024). These civic mobilisations, sparked by a combination of political repression, economic hardship and the lack of fundamental freedoms, brought about significant political upheaval in countries such as Egypt, Libya and Tunisia (Ortiz, Burke, Berrada & Saenz Cortés, 2022). Even though some governments were toppled, the aftermath of the protest has frequently been marked by instability and economic impact, highlighting the complex relationship between protest movements, governance and socio-economic wellness.

Civic mobilisation trends continue in various world regions, with protests erupting in response to misgovernance and general dissatisfaction. In Kenya, for example, the rising cost of living and perceived government corruption by the ruling party have led to protests and widespread civic unrest (Barasa, 2025). The demonstrations, championed by opposition parties in collaboration with civil society organisations, reflect deep-seated frustrations with the ruling government's economic policies, which many Kenyans perceived as instrumental to exacerbating poverty and inequality issues in the country. A similar trend was observed in Nigeria. A protest against police brutality in 2020 in the country, known as the #EndSARS movement, quickly evolved into a broader critique of poor governance, mismanagement, lack of accountability, corruption and decline in lifestyle (Adeniyi, 2022). This movement was led by young Nigerians who felt that their government was unresponsive to their needs and had failed to address security issues that average Nigerians confront in their everyday life endeavours. The protest, according to Iwara and Ojakorotu (2025), demonstrated the state of corruption in the country and the growing disconnect between the country's political leadership and its citizens, particularly among the younger generation who are increasingly demanding accountability, transparent governance and attention to the diverse socio-economic nature of the Nigerian population.

This pattern of protest linked to misgovernance is evident in various regions globally. Countries like Chile and Colombia have witnessed large-scale austerity measures, economic inequality, and government corruption in Latin America. In Chile, mass protests erupted in 2019 over a proposed increase in subway fares. The demonstrations quickly expanded to include demands for a more equitable society and ending neoliberal economic policies Chileans felt had deepened inequality (Garcés, 2019; Cox, González & Le Foulon, 2024). The 2019 Lebanon protests were sparked by a proposed tax on WhatsApp calls, metamorphosing into a broader movement against the entrenched corruption and sectarianism that have plagued the country for decades (Makdisi, 2021; Khatib, 2022). Similarly, Belarus and Myanmar protested against electoral fraud and authoritarianism, met with violent crackdowns; the potential for meaningful reform has been severely undermined, leading to further unrest and international condemnation (Amnesty International, 2021). These protests are not only expressions of discontent but also signals of deeper systemic issues that, if left unaddressed, can lead to prolonged political instability and hinder efforts to achieve good governance and sustainable development.

In an endeavour to explore alternative options to dysfunctional government policies and services, traditional African communities frequently mobilise themselves to undertake economic development by creating local enterprises, cooperatives, and self-help groups. In parts of Southeast Asia, for instance, rural communities introduced microfinance groups and cooperatives to provide credit services and financial products that are otherwise inaccessible in their areas due to the lack of formal banking services (Bezboruah, 2022; Esquivias, Sethi, Ramandha & Jayanti, 2021). The self-established community financial systems enable residents to save and invest in small businesses, agriculture, and other income-generating activities, thus enhancing economic participation and local development. Similar trends exist in many parts of Africa, such as Nigeria, South Africa, Kenya, and Egypt, among a myriad of others. Community-based organisations (CBOs), as well as savings and credit cooperatives (SACCOs), have played a crucial role in providing financial services and supporting small-scale entrepreneurship in many underserved communities (Tumwine, Mbabazize & Shukla, 2015; Mwangi & Wambua, 2016). These schemes demonstrate how grassroots African communities leverage their collective resources and social capital to build resilience, drive development, and sustain the local economy amidst dysfunctional state institutions and systemic governance concerns.

Traditional African communities' daily endeavours go beyond inculcating economic resilience; they also involve natural resource conservation and environmental stewardship for a sustainable economy. This is essential in areas where the ripple effects of misgovernance have cascaded into environmental degradation and unsustainable resource exploitation. The Maasai communities found in countries like Kenya and Tanzania, for instance, have long relied on traditional pastoralism – an economic system involving rotating grazing to prevent overgrazing in specific areas, thus maintaining ecological balance (Kereto, Oywaya Nkurumwa, Obara & Mango, 2022). A similar scenario has been observed in the Amazon rainforest, where indigenous communities develop sophisticated agroforestry systems that integrate crop cultivation with forest conservation to ensure the sustainable use of land and resources (Schmidt, Ikpeng, Kayabi, Sanches, Ono & Adams, 2021; Heredia-R, Torres, Cayambe, Ramos, Luna & Diaz-Ambrona, 2020; Wairimu Ng'ang'a & Crane, 2020). These traditional practices, while enhancing communal livelihoods, contribute to building resilient ecosystems and the preservation of biodiversity. The Bhahumono people of Nigeria are not exempt from economic resilience and self-sustenance – the age-grade system being one of the pivotal remedial mechanisms.

3. The Bhahumono Age-Grade System

The age-grade system (known as 'Ehop' in the Bhahumono language) is a traditional social institution prevalent in many African societies, particularly among the Igbo of Nigeria, the Kikuyu of Kenya, and the Maasai of Tanzania. This system organises individuals into groups based on their age, with each group progressing through distinct stages of social responsibility and leadership as they age (Babalola & Adedayo, 2021). There is no broad consensus on what age range should be considered a mate; some societies resorted to age intervals of four to five years (Babalola & Adedayo, 2021). The primary function of the age-grade system is to foster social cohesion, mutual support, and the transmission of cultural values across generations (Uzoh & Ekechukwu, 2024).

Each age grade is typically responsible for specific duties within the community, such as organising communal labour, defending the community, and performing rituals. Among the Igbo ethnic group, for example, younger age-grades are frequently tasked with physical labour and community service. At the same time, older age-grade structures take on leadership roles, serving as custodians of the community tradition. This system enhances active community participation as members integrate into the social fabric from a young age, learning to contribute to the common good while being recognised and gaining social status through grades.

In the pre-colonial era, the age-grade structures played a crucial role in African governance and conflict resolution. As globalisation and modernisation in the 21st century gradually nullify traditions, this unique Indigenous practice is becoming extinct. Regardless, African societies, particularly in rural settings, still rely on the system for local governance, with different age-grade structures having specific roles in communal decision-making and the administration of justice. In Maasai Indigenous communities, for instance, the "Moran" (warrior) age grade takes on the responsibility for the defence of the community against external aggression and enforces communal rules (Marmone, 2017; Kovač & Schulz, 2023). The older people in the community handle disputes and make decisions on matters affecting the entire society. This decentralised approach to governance encourages a participatory and inclusive system, where decisions are collectively arrived at based on experience, knowledge and hierarchy.

Comparably, in eastern Nigeria, the age-grade system historically provided security to society by mobilising male warriors for territorial defence (Atuonwu, 2021). In addition to these roles, the system maintained social order by providing clear expectations and responsibilities for each age group. This strives to mitigate possible conflict tensions and ensures that internal disputes are resolved within communal norms and values.

Age-grades are still actively involved in administering local affairs, not limited to organising community development initiatives and communal resources management. In other words, the role of the age-grade system in community development and orderliness, even in the post-colonial era, cannot be overstated. It remains a resilient and relevant institution in traditional African societies' social and cultural life. In this study, we draw on the Place-building Theory to substantiate the discourse, explicitly focusing on the role of the age-grade system in finance mobilisation for community development amidst failed governance.

4. Theoretical Framework

This study examines age-graded systems, financial imperatives, and community development based on Place-building philosophical foundations. This theory is particularly fitting for this case analysis as it offers a structured approach to evaluating how entities contribute to their immediate communities through various forms of social engagement (Kimball & Thomas, 2012). It equally serves as a guide for understanding the dynamics of community engagement and identifying effective resource mobilisation channels for socio-economic development. The Place-building Theory postulates that community engagement structures are integral to place-building practices in every society and are deeply ingrained in the intrinsic beliefs and values that drive engagement strategies.

Grounded in organisational research, the place-building philosophical foundation highlights the interplay between geographical and social spaces, stressing their significance as arenas shaped by the meanings, values, and interpretations assigned to them by individuals or groups. These spaces are not merely physical locations but socially constructed environments that acquire distinct identities through collective and individual experiences and perceptions (Rodman, 1992).

The theory also sheds light on the social relations tied to specific spaces, with "place" as a platform that mediates interactions between individuals, groups, entities, and broader political structures. In other words, "place", in the context of the theory, is not limited to a static or purely local phenomenon but a dynamic construct influenced by multifaceted elements such as human intentions, goals, and values. Within the scope of this paper, age-grade systems assume both physical and social roles, for instance, community development projects in the Igbo ethnic contexts and conflict resolution as in the case of Maasai indigenous communities (Marmone, 2017; Kovač &

Schulz, 2023). This interpretation aligns seamlessly with the Usumutong context, wherein the current study was conducted.

Usumutong is one of the nine traditional communities in the Bhahumono tribe of Abi Local Government Area in Cross River State, Nigeria. The Bhahumono clan comprises Abeugo, Afafanyi, Bazohure, Ebijakara, Ebom, Ediba, Enong and Igonigoni. Geographically, the Bhahumono area is bordered by Ndibe, Abeomege, and Abriba of Ebonyi State to the east, separated by a river, and Itigidi to the north, with the same river flowing through the shores of Ebijakara, Ebom, Bazohure, Igonigoni, Afafanyi, Abeugo, Ediba, and down to Enong.

To the west, it shares a common boundary with Ekori and Ugep in the Yakurr Local Government Area, extending from Enong and Ediba to Usumutong. To the south, Usumutong borders Ijom in the Biase Local Government Area, which also borders Ebijakara and Ebom.

Usumutong is a rapidly growing village, although it remains predominantly rural, with its economy centred around agriculture, particularly rice farming, cassava production, yam cultivation, and palm oil extraction, in which it excels. Despite its agricultural productivity, the area struggles with inadequate infrastructure, including unstable electricity, a lack of clean water, outdated school facilities, insufficient markets, and a dilapidated road network.

These are common characteristics of Bhahumono – structural issues exacerbated by government negligence, a lack of political will and accountability, and longstanding communal conflicts over land disputes. In response to these challenges, the community's social structures have taken on a vital role in addressing these evolving challenges.

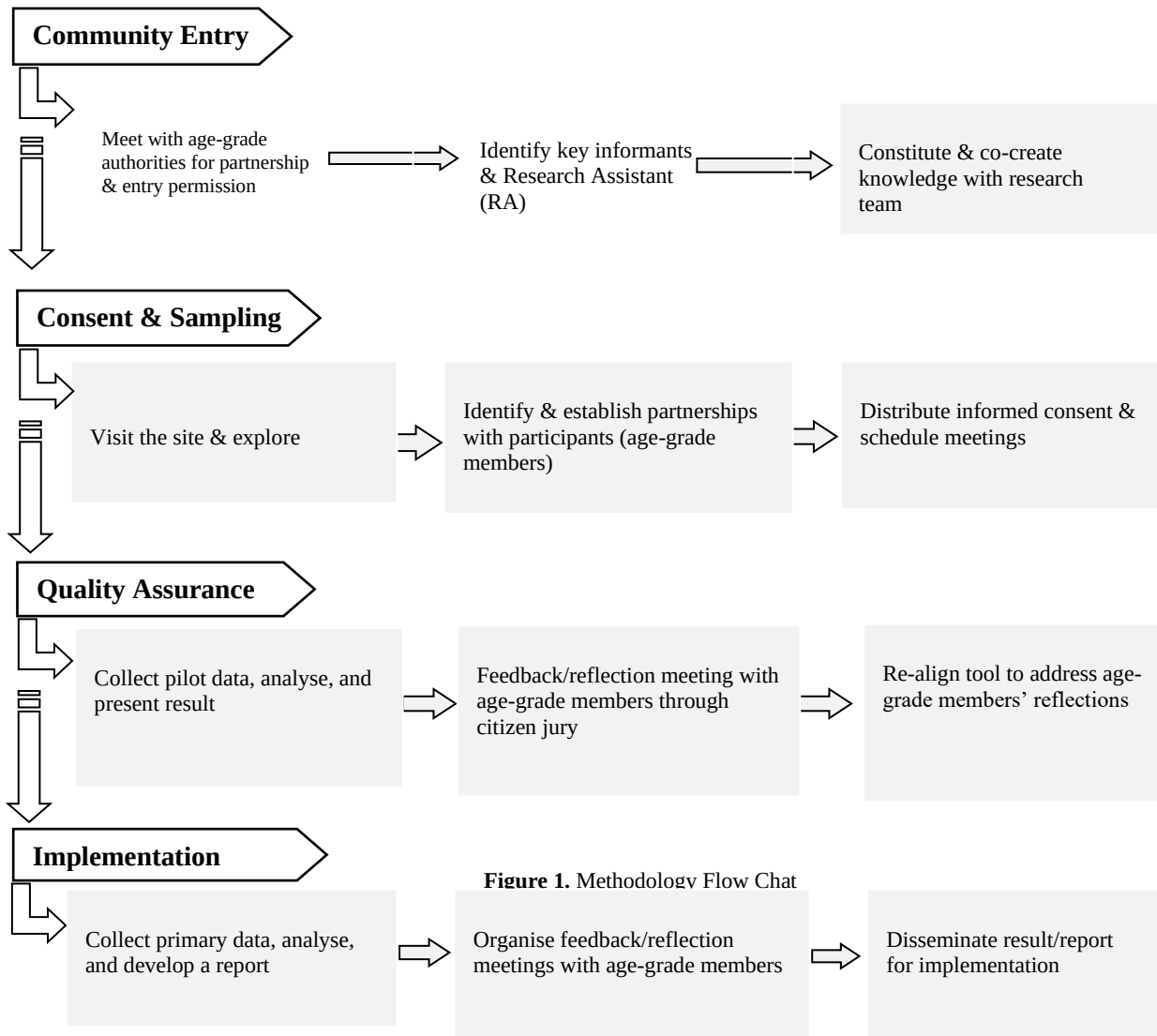
The people's resilience finds legitimacy in the narrative that the goal of development planning in Nigeria is the achievement of a rapid increase in the nation's productive capacity to improve the people's standard of living (Iheanacho, 2014).

The condition of most rural dwellers, however, has not improved; instead, communities are in depression, degradation and deprivation (Ogundipe, Ogguniyi, Olagunju & Asaleye, 2019), resulting mainly from the government's negligence on proposals for community development, non-implementation of projects, leadership concerns, insufficiency of financial resources, intra- and inter-communal disputes and corruption.

These matters merit both research attention and policy reforms.

5. Methodology

An exploratory qualitative case study methodology was employed, utilising a participatory community-led action research approach as depicted in Figure 1.

**Figure 1. Methodology Flow Chat***Source: Authors' consolidation*

Participatory action research facilitates robust engagement with grassroots knowledge-holders, specifically members of well-constituted structures, in this case, age-grade groups, to derive essential firsthand insights. Through the purposive sampling technique, ten age-grade systems were selected for the study, ranging from newly inducted groups into adulthood to the recently graduated group into senior citizenship (see Table 1). These groups, having performed the rite of passage, constitute part of the traditional composition of the community and are recognised as such; within the village structure, they are authorised to exercise certain institutional practices and are mandated to contribute to the society's socio-economic fabric and physical domains.

Table 1. Age-Grade Societies Selected for the Study

S/N	Age grade	English meaning	Age range
1	Redah	Believe	1950-1953
2	Rekpena	Lucky	1957-1959
3	Hovare	Prosper	1962-1965
4	Bhikpengha	Brilliant	1964-1966
5	Hodo	Blessing	1966-1969
6	Rofem-sen	Oneness	1968-1970
7	Razep	Love	1970-1972
8	Bhuyina	Riches	1973-1975
9	Iso-ovia	Dedication	1974-1976
10	Otta-bhuyina	Wealth	1976-1978

Source: Authors' compilation

The purposive sampling technique was complemented by snowball sampling to identify stakeholders within each of the ten sampled age-grade systems for data collection, which was undertaken through one-on-one interactions using a semi-structured questionnaire. Questions such as - *"What are the revenue channels of your age grade?"* *"How does your age grade maintain financial resilience?"* *"What are your contributions to the community's development?"* and *"How do you carry out community development projects in your community?"* were posed to participants for discussion. Data collection was guided by a saturation threshold, which continued until the information obtained from subsequent participants became redundant. In total, 29 individuals participated in the study, representing each age group well. The collected data excerpts were then input into Atlas.ti v8 software, utilising an open coding system for thematic data analysis. This approach facilitated the organisation and interpretation of the data to identify key themes and patterns related to the research focus. In the results and discussion of findings section, the following codes and their respective meanings are used: AG = Age group; F = Female; M = Male; and Yrs = Years.

6. Results and Discussions

The result is structured into two sections. The first section focuses on capital mobilisation avenues within the age-grade system. The second section provides an in-depth exploration of the community infrastructure development projects executed using the resources.

6.1. Age-grade income channels

Seven key financial mobilisation channels were delineated. This includes membership fees, mandatory dues, default fines, group angels, levies, project launch events, and menial labour (Figure 2).

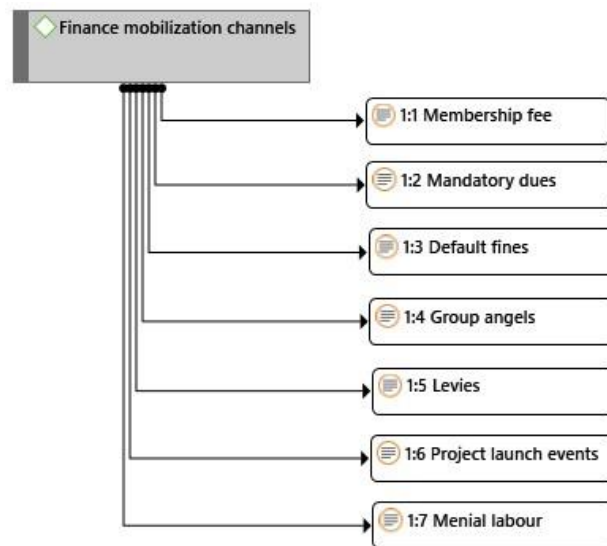


Figure 2. Age-grade finance mobilisation channels
 Source: authors' consolidations based on primary data

An age-grade group typically begins with a small cohort of peers, frequently teenagers of the same age range who have been socialised within the same developmental milieu and geographical location. These early members form the group's foundation, bonding over shared experiences and gradually developing the structure, rules, and objectives guiding their collective activities. As a group matures and organises, it is recognised within the community as a traditional entity, formalising its existence through registration with local authorities or community leaders. This formalisation stabilises the group and affirms its role as integral to the community's social fabric.

The age grade system becomes a desirable association for other peers of the same age range who were not part of the original cohort upon an age group attaining formal recognition and full functionality. At this stage, identifying with the group typically involves membership fees and dues, which serve multiple purposes. The proceeds contribute to the group's ongoing expenses, supporting activities, projects, events, and other communal responsibilities. In addition, the membership fee is a commitment to belonging to a well-established, respected and recognised community group, fostering a sense of responsibility and investment in the group's success and societal development. This membership registration fee system not only helps sustain the group's financial health but also ensures that subsequent memberships share in the collective responsibility of maintaining the group's traditions, goals and objectives. A participant narrates:

"...it was a highly seasonal effort, providing an additional income stream for the group... I am mentioning it now because the funds we raised through this initiative played a critical role in completing our mandatory community development project and making the necessary arrangements for our induction. At that time..., the collectively agreed fee for new members was set... ₦7,000 (seven thousand Naira) for those within our age range, mainly people born between 1976 and 1978... We also allowed those slightly outside this range limit - by a year or two - to join us, provided they demonstrated the requisite maturity; however, joining under these circumstances sometimes requires an additional fee. This approach not only helped in raising substantial funds but also ensured that our group remained composed of individuals who were not only age peers but also shared a similar level of life experience and readiness for the responsibilities that came with our community roles" (Ottabuyina AG, 46 Yrs, Female).

6.2. Mandatory Dues

Ensuring financial resilience and stability requires unanimous agreement on the payment of dues, payable monthly, quarterly, annually, or at each meeting. This flexible payment schedule accommodates the members'

diverse economic backgrounds, ranging from civil servants and businesspeople to farmers and other professionals. The age-grade groups recognised the significance of setting a minimum affordable contribution for every member, regardless of their economic status. This is crucial in ensuring every member is accommodated. Another participant explains:

"...ensuring the financial stability and resilience of our age-grade, there was a collective agreement on a dues system, where each member compulsorily contributes a predetermined amount to the central purse at every meeting... Those with higher incomes may, at their discretion, contribute more. As earlier alluded to, all members reached this arrangement harmoniously during one of our gatherings, recognising that consistent financial contributions to the central purse are essential for the group's financial stability and ability to fund its events, projects, and community responsibilities. Setting these dues enables us to establish a reliable financial foundation to plan and carry out our initiatives effectively. Aside from these benefits, the system also fosters a sense of shared responsibility and accountability, as every member, either rich or poor, contributes to the group's financial health, reinforcing our collective commitment to the age-grades' long-term success and societal impact" (Hovare AG, 59 Yrs, Male).

Participants' excerpts explain the structure of the dues, which is designed not only for income generation but also to encourage inclusivity while allowing for voluntary contributions from those with higher incomes. The age-grade members with greater financial means can contribute more than the minimum amount, reflecting their ability and benevolence to support the group's financial goals more robustly. This approach fosters a sense of equality, unity and mutual support within the age group and reinforces the collective responsibility for the group's financial health, resilience and long-term sustainability.

6.3. Fines for misdemeanour

In the age-grade system, "fines" refer to financial penalties imposed as punishment for breaking regulations. These mandatory penalties are crucial in maintaining resilience, serving as a key source of income generation. In a typical age-grade set-up, fines are imposed for various infractions, including misconduct, tardiness, absenteeism, and failure to adhere to the group's established laws, rules and codes of conduct. In administering fines for these misbehaviours, the age group ensures that members remain responsible and accountable, creating a deterrent against actions that could disrupt the group's harmony and effectiveness. The collected fines contribute to the age group's financial pool, thereby building their overall stability and providing a buffer that can be used for unforeseen expenses and/or to support members in need. It was emphasised that:

"One of the age-grade group's financial sustainability is underpinned by strict regulations and the imposition of fines, which instil discipline among members and ensure the smooth functioning of the organisation. "... despite the seemingly small amounts - ₦100, ₦500, or even ₦1000 - these contributions collectively play a pivotal role in funding our group's central purse and various projects (Hodo AG, 57 Yrs, Female).

"...these fines are levied for a range of infractions in the group, including lateness, absenteeism without valid reasons, the use of offensive language, substance abuse, physical altercations, and other forms of social misconduct in society. ...maintaining these standards, we uphold our financial stability and safeguard our moral standing and reputation within the community. ...as we support one another in times of need and stress, we closely watch and hold each other accountable for every action taken in society to ensure that no individual's behaviour tarnishes the good name of our age-grade group. This traditional orientation of mutual accountability helps foster a culture of respect and responsibility, essential for any organisation's longevity and success" (Hodo AG, 56 Yrs, Male).

The participants' narrative on implementing mandatory fines shows that this strategy fosters a culture of discipline and responsibility among members within the group and their society. The assumption hinges on the premise that members are more likely to be conscious of their behaviours, inculcate moral decadence, adhere to the group's guidelines and show greater commitment to collective goals when they understand that their delinquencies have financial consequences. Beyond income generation, this accountability system helps maintain orderliness and ethical conduct for the common good.

6.4. Group Angels

In a typical age-grade system, group angels are wealthier members who frequently provide financial donations to boost the group's resilience. These categories of individuals recognise the collective goals and the varying economic capacities of other members, thus stepping in with generous contributions to sustain and advance the group's activities. It is worth noting that donations of this magnitude are not solicited but given voluntarily at individuals' discretion, reflecting the commitment of these wealthier classes to the group's overall well-being. Their contributions significantly boost the group's financial resources, allowing for the funding of projects and support for members facing financial difficulties or the expansion of the group's initiatives beyond what the regular dues and fines could cover. A member of the Rekpene age grade added:

"The saying - 'All things by law divine are equal' - might hold an idealistic truth, but in practical terms, inequalities inevitably emerge, even within the context of age-grade groups. In my age- grade, for instance, the members' backgrounds are quite diverse, encompassing academic doctors, medical doctors, high-ranking security personnel equivalent to a police commissioner or military general, directors in prominent parastatals, successful businesspeople, civil servants, and farmers. These different professions naturally lead to varying income streams and financial capacities. As a result, when the group needs to pool resources for a common cause, contributions are made according to one's ability. While there is a minimum threshold to ensure inclusivity, set at a level that even those with the lowest income can afford, those with greater financial means often choose to donate significantly more. This voluntary generosity from the wealthier class frequently boosts the group's income without creating a sense of inequality or division. Even though the disparity in contributions is conspicuous, we all maintain a strong sense of unity and camaraderie, ensuring that all of us, regardless of financial contributions, receive deserved respect and value - reflecting the group's collective commitment to supporting each other while acknowledging individual capacities". (Rekpene AG, 65 Yrs, Female).

The presence of group angels demonstrates the diversity within the age-grade groups and emphasises the need for solidarity and mutual support. Voluntary donations are not just acts of generosity but also serve as investments in the group's long-term stability. In sharing their wealth voluntarily, these members contribute to creating a more balanced and equitable environment for every member to function and thrive and ensure that the group functions despite economic challenges. In addition, the culture of receiving unprecedented financial support from the wealthier class reinforces the sense of community within the age-group system, as it reflects a shared commitment to the collective benefit, regardless of individuals' economic status.

6.5. Levies

Like other resources, levies play a significant role in the financial operations of age-grade groups, especially during important events such as weddings, festivals, funerals, and community projects. When, for instance, a group member or a relative experience a life event or when the group undertakes a collective project, other members contribute to a communal pool. Similarly, members contribute to a pool during a community event like the 'New Yam Festival' celebration, coronation, and road maintenance, among other events, facilitating the coverage of immediate expenses. All members' mandatory collective financial contribution reflects a deep sense of solidarity and mutual assistance, ensuring that no member bears the full burden of significant life events alone.

"...whenever our village is in need, for instance, the urgency for road construction and/or maintenance, land disputes resolution with neighbouring villages, or even organising significant events like the New Yam Festival..., levies are typically imposed on all formalised age-grade structures. In our village, the age-grade system is one of the most effective structures for mobilising these meaningful funds for social projects. Because every adult is obliged to be part of an age-grade system, it becomes an effective mechanism for everyone in the community to participate in its development. The community council determines a fixed amount for each age grade to ensure timely compliance with payment deadlines. Once this is established, each age group convenes to decide on the specific amount most convenient for members to contribute to articulate the goal. This pooled fund is then directed towards the community project, ensuring the financial burden is shared equitably among members" (Bhikpengha AG, 58 Yrs, Female).

The funds are initially raised for a specific event; however, any surplus is systematically reserved and channelled into a central account managed collectively by the age grade. This deposit is a foundation for long-term community projects that extend their positive impact beyond the group's members to the broader community. This deliberate practice of finance pooling and prudent allocation illustrates the group's unwavering dedication to

immediate objectives and future aspirations, cementing its crucial role as one driving force behind the community's sustained growth and overall well-being.

6.6. Project Launch

Age-grade groups frequently organise special launching events to roll out or celebrate their milestones. Strategically designed, these events engage key stakeholders such as community leaders, political representatives, successful businesspeople, and other prominent figures within and beyond the community. The essence is twofold: 1) to showcase the age-grade groups' efforts in community development, 2) to generate support, both in terms of recognition and financial contributions. The presence of dignitaries at these events enables the group to gain public acknowledgement for their initiatives, generate income through donations, and strengthen their support network, which is imperative for successful project implementation.

"...well..., we do organise events to raise funds. Although not very often... These events, specifically project launches, garner significant attention, bringing dignitaries and many community members who attend to show us their support. ...we usually experience an appreciable turnout; people participate and demonstrate generosity. To me, such events highlight our community's collective commitment to progress. It also emphasises the value of communal efforts in driving inclusive and sustained development. It goes past just fundraising; the gatherings serve as vital avenues to strengthen social bonds and express our shared dedication to the success of our projects. Also, they serve as platforms for uniting diverse community segments, enhancing a sense of unity and purpose..." (Otta-bhuyina AG, 47 Yrs, Male).

Launching projects and related events set the stage for income generation. The participation of community members, especially influential figures, frequently translates into substantial donations, which are crucial for the financial stability of the age-grade society. These accrued contributions can be directed towards completing an ongoing project or funding the launch of new community development initiatives. These projects ensure that age-grade groups remain financially resilient and capable of taking on massive and more impactful community development projects over time.

6.7. Menial Labour

Evidence emerged that, decades ago, certain age-grade groups were involved in paid jobs as a collective effort to strengthen their financial capacity. These tasks, frequently sourced from within the group, that is, among members, not only enhanced income generation but also fostered a sense of solidarity and strengthened communal bonds within the group. Through collaborative menial work on different undertakings, members could pool their earnings into a central account and strategically manage to pursue the group's shared objectives. This approach provided a sustainable financial foundation, enabling the group to support communal projects, organise social events, and implement initiatives that benefit its members and the broader society. This reflects grassroots experience, as one participant explained:

"I recall an instance in those days where a group assisted one of their age mates in transporting yams. The primary intention was to show solidarity and support, demonstrating the strong sense of community that binds them together. In a gesture of appreciation, he compensated the group far more generously than it would have cost him to hire external labour. This reinforced their bond and exemplified the reciprocal nature of our community's support system, where acts of kindness are acknowledged and valued. While we don't often take on such menial contracts, if they still exist, they provide a valuable means of generating funds for any group. These earnings are crucial in sustaining activities and contributing to collective projects, ensuring the group remains resilient and capable of achieving shared goals. This experience highlights the strength of communal ties and the importance of mutual support in fostering individual and collective progress" (Rekpene AG, 65 Yrs, Female).

Taking on periodic labour inculcates a sense of responsibility and mutual support among members. It emphasises the value of hard work and collective effort, ensuring that all members contribute to the group's financial well-being regardless of their economic standing. The funds generated from these labour activities help to maintain the group's financial stability and empower the age-grade group to undertake larger community projects, thus reinforcing their role as active contributors to the development and welfare of their wider community.

7. Infrastructure Community Development Through Age-Grade Projects

The ten age-grade groups involved in the study have each contributed to at least one significant community infrastructure development project, demonstrating their crucial role in advancing local development (see Table 2).

Table 2. Infrastructural community development age-grade project

S/N	Age grade	English meaning	Age range	Projects undertaken
1	Redah	Believe	1950-1953	<i>Roofing zinc donation for the community secondary school building project.</i> <i>Culvert construction project along the Ugep-Usumutong major road</i>
2	Rekpenne	Lucky	1957-1959	<i>Building a magnificent statue of his royal highness, the late King Okpani Osim.</i> <i>The construction and mounting of the Ekpokan monument - the community's symbol of strength, resilience and victory.</i>
3	Hovare	Prosper	1962-1965	<i>Contributions towards building a classroom block in the community's Primary School II.</i>
4	Bhikpengha	Brilliant	1964-1966	<i>Culvert construction in the community town street.</i>
5	Hodo	Blessing	1966-1969	<i>Building a classroom block for the community primary school IV project.</i>
6	Rofem-sen	Oneness	1968-1970	<i>Building two classroom blocks for the community primary school IV project.</i>
7	Razep	Love	1970-1972	<i>Building two classroom blocks for the community primary school IV project.</i>
8	Bhuyina	Riches	1973-1975	<i>Building the community's king's palace.</i>
9	Iso-ovia	Dedication	1974-1976	<i>Erecting a brick fence for the community's primary school.</i> <i>The construction of a culvert along the Comprehensive Ndam Secondary School Road in the community.</i>
10	Otta-bhuyina	Wealth	1976-1978	<i>The structuring and building of the community's event centre.</i>

Source: Authors' consolidation based on primary data

These projects (Figure 3), which have had a notable impact on the social and economic fabric of the community, stem from three primary motivations. First, there are the cultural and traditional procedures associated with the rite of passage to adulthood, where contributing to community welfare symbolises maturity and social responsibility. Second, there is a strong drive for community development, with age-grade groups viewing the improvement of local infrastructure as enhancing the quality of life for all residents, accelerating the community's overall progress. Finally, the rite of passage to senior citizenship is a powerful incentive for individuals to leave a legacy through tangible contributions to the development of the community. These motivations underscore the enduring cultural relevance and developmental impact of the age-grade system, as reflected in the various infrastructure projects they have successfully undertaken.

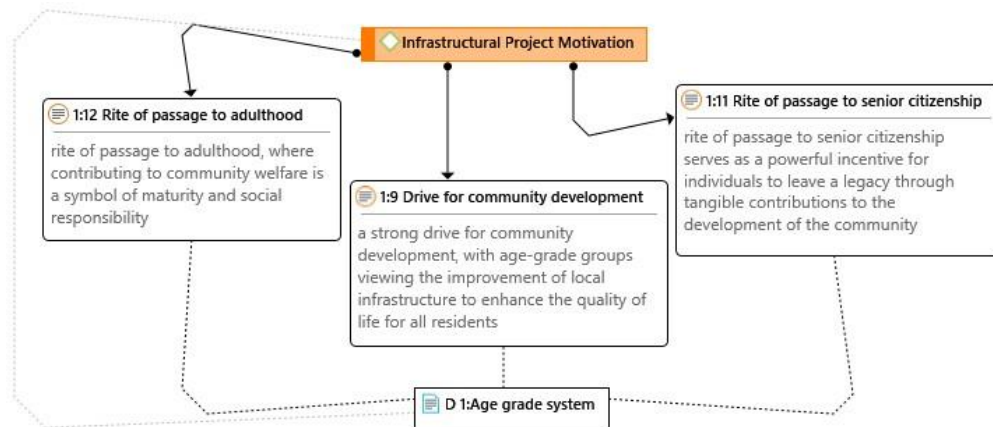


Figure 3. Age-Grade Groups' Motivations for the Infrastructural Project
Source: authors' consolidations based on primary data

7.1. Rite of Passage to Adulthood

The age-grade system's commitment to community development is multifaceted, incorporating mandatory and voluntary components. In the Usumutong community, for example, an age-grade group gains formal recognition as a traditional entity by registering with local authorities or community leaders. This formalisation process stabilises the age-grade and embeds it as a vital component of the community's social structure. In addition, the recognition requires a significant demonstration of responsibility; for instance, members must carry out a mandatory and tangible community development project, usually assigned by the community's council of chiefs or traditional leaders. Evidence shows that such projects are allocated at least two years before the age-grade groups' induction into adulthood, testing the group's maturity, competence and ability to advance the community's development imperatives. As explained, the project implementation is a prerequisite for the age-grades rite of passage into adulthood:

"... it is a longstanding tradition in our community that each age group must complete at least one infrastructural development project before entering adulthood. For our group, we recognised a pressing need within the community - the absence of a dedicated palace for our King, who had been using his family home for official duties. After much deliberation, we constructed a proper King's palace..." (Bhuyina AG, 48 Yrs, Female).

"...between 2016 and 2018, our group of about 60 active members pooled our resources, combining physical labour, moral support, and financial contributions to see the project through to completion. Regardless, our resilience and determination truly embodied the spirit of our age-grade, aptly named "Riches." Completing the palace was a testament to our capabilities and an expression of our deep love and commitment to the community that nurtured us. This project was more than just a building; it symbolised our collective identity and readiness to take on greater responsibilities as we transitioned into adulthood..." (Bhuyina AG, 49 Yrs, Male).

An age-grade induction into adulthood is a pivotal event that occurs once in a lifetime, typically for individuals around the age of 40 years. This grand ceremony is a cornerstone of community life, marked by a week-long festival with various activities. The magnitude of the ceremony is such that it halts other social events, as the entire community convene in harmony to grace the occasion. The induction ceremony is culturally profound and engrained in traditional practices, featuring a grand procession in the community, where the celebrants, well-decorated, are accompanied by their mentors, who would guide them through the transitional rituals, like engaging the group in a traditional targeted shooting game, ushering members out of the youth circle. In this ceremony, various indigenous cultural music displays praise the celebrants and revitalise the festive atmosphere. The ceremonial week culminates over a year of preparation between the age-grade groups, their mentors, and the community's Council of Elders. This event reinforces the age-grade status in society, symbolising their readiness

to assume greater responsibilities in the community. The event simultaneously acts as a unifying agent, convening different generations in one space to celebrate a shared cultural heritage. The grand procession, rituals, and traditional music reiterate the age-graded connection to the community, ensuring that the transition from youth to adulthood is well celebrated with the respect and honour it deserves.

7.2. Drive for Development

Beyond mandatory projects obligated to age-grade groups as one of the requirements for the rites of passage from youth to adulthood, some groups also frequently demonstrate a strong commitment to community development. It undertakes voluntary projects. As alluded to, these latter projects are not mandated but motivated by the group's sense of responsibility to better their community. Members pool funds and leverage their physical capabilities to carry out independent projects, significantly improving community infrastructure and social services. The funds for these voluntary projects are typically catered for from the group's reserves, accumulated over time through different channels - membership fees, donations, and levies - among other means. Drawing on these reserves, the members ensure they can respond effectively to the community's needs without external support, illustrating dedication to collective welfare.

"...during our passage rituals..., we built a magnificent statue to honour our late Chief Okpani, a revered leader known for his exceptional wisdom and leadership prowess during his era. The late Chief Okpani was celebrated for his ability to conquer communal battles..., drive inclusive development, and foster unity and cohesion among his people... His legacy, which remains influential even 30 years after his demise, is marked by an enduring impact on our community's growth and stability. Recognising the significance of preserving his memory for future generations, we prioritised creating this magnificent statue as part of our mandatory community project..." (Rekpene AG, 64 Yrs, Female)

"...we voluntarily embarked on another monumental task: constructing a structure named after the community's botanical emblem, 'Ekpokan.' This monument, symbolising the community's strength, resilience, and victories across various spheres, such as communal wars, economic struggles, and traditional sports, was our way of immortalising the essence of our community. Unlike the statue of Chief Okpani, which was a required undertaking, the Ekpokan monument was a voluntary effort, driven by our collective desire to honour the community's enduring spirit and ensure that its name and heritage continue to be celebrated..." (Rekpene AG, 65 Yrs, Male).

Beyond the urge to respond quickly and aptly to the community's needs, voluntary projects reinforce the age-grade role as a vital and active participant in the community's development. Addressing pressing issues, the age-grade group enhances the community's living conditions and strengthens its reputation as responsible and dependable leaders. These efforts often involve extensive collaboration among group members, with everyone contributing according to their abilities through financial donations, labour, or expertise. This collaborative spirit fosters a sense of unity within the age-grade group. It sets a positive example for the younger generations, thus encouraging them to continue this tradition of community service.

7.3. Graduation to Senior Citizenship

Parallel to the passage into adulthood, age-grade systems reaching 70 years of age transition from active adulthood to senior citizenship, marked by significant rituals and grand ceremonies. This transition implies that the group retires from 30 years of active involvement in community engagement and obligatory societal responsibilities. However, the group is now categorised as essential "knowledge-holders". The ritual during the exit recognises the members' lifelong selfless contributions and further signifies their new role as community advisors and custodians of cultural heritage.

"...society certainly benefited from the projects we carried out over the years. Some 30 years ago, during our rite of passage into adulthood..., we embarked on the significant task of constructing part of the community's secondary school, recognising the role of education for our future generations. As we approached 70 years..., the hallmark of retirement, we felt a deep sense of gratitude and responsibility to give back one last time. As a token of our appreciation to God for His blessings and as a final gesture of service to our community, we completed the construction of a culvert on one of the major roads. This project will benefit the community for years to come. This was voluntary. As senior citizens, we proudly reflect on our contributions, knowing that our efforts have left a lasting impact on the community that nurtured us" (Redah AG, 71 Yrs, Male).

The graduation rituals into senior citizenship closely mirror those of the passage into adulthood, following a similar trajectory with cultural dances and traditional processions. These ceremonies are deeply rooted in the community's cultural practices, hence celebrating the group's transition with the same grandeur and reverence as their previous induction into adulthood. The performance of these rituals – exiting from one level and entering a higher level - symbolises the community's respect for its elders and acknowledges their lifetime of service. The events are often accompanied by festive activities, including the involvement of younger generations who assist in organising the ceremonies, ensuring that the traditions are passed down and preserved for future age-grade groups. Society honours the incoming elders' unwavering experience and wisdom through these rites, integrating their guidance into the ongoing sociocultural framework.

8. Discussion of Findings

Stakeholders' lived experiences demonstrate that community development within African societies, such as the Usumutong, is a complex and holistic process deeply ingrained in traditional practices. This narrative aligns seamlessly with Atisa, Zemrani and Weiss (2021), Bobo and Akhurst (2023), Wardhani, Rahmawati and Pamungkas (2024), and Winati, Utami, Rakhmadani, Hidayatullah and Puddin (2024), who maintained that community development is rooted in empowerment and collective action. In this perspective, community members are not passive recipients of external aid but are recognised as experts and champions of their sustainability. Through their lived experiences, community members identify key issues, map out interventions, and take collective mitigative action, fostering stronger social ties, deeper connectedness, and overall community resilience.

The age-grade system in African societies exemplifies the participatory approach, where different groups operate at various levels of social and economic organisation, however, ultimately coming together to achieve common societal goals that would be unattainable individually (Atuonwu, 2021; Babalola & Adedayo, 2021). This orientation has historically played a significant role in fostering community development, as it organises collective efforts around mandatory and voluntary projects, which are crucial for physical infrastructure and social cohesion. Through age-grade systems, for instance, community members mobilised themselves to contribute to development projects - frequently relying primarily on local resources, with or without external support (Uzoh & Ekechukwu, 2024). This approach to development illustrates self-help and unity, with all community members participating fully in decision-making and implementation.

The research findings further broaden our understanding of the significance of age-grade associations in building a resilient society and fostering community sustainability within the African context. Rooted in place-building theory, which stresses the significance of social and spatial connections (Kimball & Thomas, 2012), age-grade groups' mandatory and voluntary initiatives extend beyond mere physical development. They contribute significantly to strengthening communal identity and solidarity; for instance, infrastructure development initiatives were undertaken before the rite of passage into adulthood transcended their symbolic intention as transitional milestones. These rituals and initiatives serve as tangible mechanisms for establishing and sustaining essential services in society and shared spaces within the community. The shared responsibility and collective action demonstrated by the age-grade societies address immediate societal developmental needs, contributing to the long-term sustainability and resilience of the community.

Age-grade associations, therefore, facilitate cultivating a strong culture of accountability and responsibility among members, which aligns with Atuonwu (2021). The cyclical structure of these associations ensures that each generation is actively involved and contributes to the community's welfare through obligatory and voluntary projects. Mandatory projects, such as school construction, road maintenance and communal facility development, continuously upgrade infrastructure to meet evolving societal needs. Meanwhile, voluntary initiatives, including

monument building and resource mobilisation for unforeseen societal issues, demonstrate these associations' proactive and adaptive nature. Drawing from the place-building theory, the emotional connections members build through these efforts create a profound sense of place attachment and pride. This attachment deepens their commitment to the community's well-being and encourages environmental stewardship, ensuring a resilient and sustainable future for subsequent generations. Additionally, the age-grade system exemplifies a highly effective Afrocentric model for addressing immediate and long-term societal needs in traditional communities.

Conclusion

The lived experiences of the Usumutong people facilitated the conceptualisation of age-grade association as a pivotal finance mobilisation resource for community development amid systemic failure in Africa. The ten age-grade structures sampled for empirical analysis have each undertaken at least one significant tangible community project, demonstrating their critical role in fostering local sustainable development. Seven notable sources of income across the interviewed structures include membership fees, mandatory dues, fines, group angel investors, levies, donations from project-launch events, and menial labour contributions. The initiatives facilitate the implementation of diverse infrastructure projects and social initiatives, including the construction of a school building, community event centres, a king's palace, culverts on major roads, and a symbolic statue, among others. Three fundamental occurrences: rites of passage to adulthood, a strong commitment to community development, and rites of passage to senior citizenship, aided the projects. These motivations collectively illustrate the enduring cultural relevance and developmental power of the age-grade associations, illustrating how they have been effectively harnessed to advance the quality of life for all residents and ensure society's continued progress. The Usumutong case is a compelling example of how indigenous practices are crucial in building a resilient local economy and driving sustainable development, even amidst persistent systemic ill-governance issues.

Subsequent research may explore the age-grade dynamics in different African regions, their capacity to adapt to contemporary socio-economic conditions, and their potential to scale up for broader development applications. Community development practitioners should integrate traditional systems like the age-grade model into modern development frameworks, recognising and leveraging these structures as resilient mechanisms for local resource mobilisation and project execution apparatus, especially in rural areas where civic governance could be insufficient. Policymakers should acknowledge and formalise age-grade structures in national development strategies, ensuring that legal frameworks support these traditional practices, as this would facilitate their contributions to community development.

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SERVICE DELIVERY CONUNDRUMS IN SOUTH AFRICAN MUNICIPALITIES

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Abstract. The South African municipal government is primarily responsible for service delivery. However, millions of citizens still face conundrums in accessing basic utilities such as electricity, water, sanitation, and refuse collection. The apartheid legacy has led to massive backlogs and challenges, but also the policies implemented since 1994 are primarily responsible for the current service delivery conundrums. The study aims to investigate the factors that cause service delivery delays in the South African municipal government. The study adopted a qualitative research methodology to identify and analyze the key factors contributing to service delivery delays. The data was collected from secondary sources and analyzed thematically using thematic content analysis. The study findings indicate that service delivery remains a persistent conundrum in many South African municipalities, often leading to public dissatisfaction and protests. It was further found that bureaucratic inefficiencies, financial constraints and mismanagement, political-administrative interface, systemic corruption, and lack of institutional capacity and resources are significant barriers to effective service delivery. The study recommends a comprehensive approach to enhance service delivery in South African municipalities, focusing on strengthening local government efficiency. One key strategy is capacity building, which involves training municipal staff to plan, implement, and monitor service delivery projects. This training can lead to more effective governance and improved municipal services. The study acknowledges that ethical governance is crucial for improved financial management and service delivery in municipalities. A mindset shift for municipal officials and politicians is needed to focus on service delivery and efficient resource management, ensuring municipalities are run as efficient businesses. Lastly, the study also suggests revising the policy framework, particularly the 1998 White Paper on Local Government, to address systemic challenges and ensure responsive local government.

Keywords: service delivery; service delivery delays; municipal governance; district development model; integrated development plan; municipalities; protests

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JEL Classifications: H41

1. Introduction

Local governments worldwide play a crucial role in delivering essential services to their communities, contributing to social development, economic growth, and infrastructure maintenance (Matyana & Mthethwa, 2022). In South Africa, municipalities are mandated by the Constitution of the Republic of South Africa (1996) to provide residents with essential services such as water supply, sanitation, electricity, and waste management. However, despite the democratic government's efforts to address the deep-rooted inequalities of the apartheid era,

challenges in service delivery persist. While historic injustices have contributed to existing backlogs, many contemporary issues arise from administrative inefficiencies, financial mismanagement, and political-administrative interference (McDonald & Pape, 2002; Bester, 2024; Potlaki, 2024; Amusa, 2024).

However, Matyana et al. (2022) argued that one of the key mechanisms implemented to improve municipal governance and service delivery in South Africa is the integrated development plan (IDP). According to the Municipal Systems Act (32 of 2000), every municipality must formulate an IDP to align municipal budgets with community needs and ensure adequate service provision. However, Mamokhere (2022) and Matloga, Mahole, & Nekhavhambe (2024) opine that the success of IDPs meant for effective service delivery is often hindered by poor public participation, governance challenges, and mismanagement. Matyana et al. (2022) highlighted that limited community involvement and political interference in IDPs undermine their intended purpose, leading to ineffective service delivery. Furthermore, Managa (2012) stated that these conundrums are compounded by maladministration, fruitless expenditure, and a lack of transparency and accountability in local governance.

Statistics South Africa (2024) stated that service delivery is a fundamental responsibility of municipalities, ensuring that essential services such as water, sanitation, electricity, and waste management reach communities effectively. StatsSA (2024) also stated that access to basic services has improved between 2011 and 2022. According to Census data, access to clean water has grown from 85.1% to 88.5%, and improved sanitation has been enhanced from 68.9% to 80.7%, highlighting ten years of service delivery progress. However, Ragolane (2022) and Myeni, Matyana, & Mthembu (2024) imply that delays in service delivery have been a recurring issue in South Africa, often leading to community protests. This study reviews existing research to identify and analyze the factors contributing to service delivery delays and proposes potential approaches to enhance service delivery in South African municipalities.

2. Problem Statement

Many pieces of legislation govern the administration of service delivery in South African municipalities. However, the legislative frameworks are often undermined through corrupt practices by politicians and municipal officials, which leads to poor service delivery. Legislative frameworks such as the Constitution of South Africa (1996), the Municipal Systems Act (2000), and the Municipal Structures Act (1998) were established to foster participatory governance and improve service delivery. On the other hand, the legislative frameworks were established to eliminate corruption, yet their full implementation remains a challenge (Matyana et al., 2022). Madumo & Koma (2022) stated that local government faces challenges due to dysfunctional municipalities, poor financial performance, and poor political leadership.

The South African government should revisit constitutional powers granted to local government and introduce a pragmatic model for running municipal affairs, as they face systemic issues related to fulfilling their constitutional obligations. Furthermore, Madumo & Koma (2019) indicated that to enhance service delivery, municipalities must fully embrace participatory governance as mandated by the South African Constitution (1996), specifically Chapter 7, Section 152. The IDP is a primary mechanism guiding municipal budgets and initiatives; it should be utilized effectively to ensure efficient service provision, promote local economic growth, and foster community engagement in governance. However, Managa (2012) and Mamokhere (2022) stress that financial mismanagement, wasteful expenditure, and political influence in decision-making undermine service delivery and citizen trust. Thus, addressing these systemic inefficiencies requires a renewed commitment to transparency, accountability, and community-driven development. In terms of the White Paper on Local Government (1998), municipal services ought to be:

- Accessible and communities should have access to at least a minimum level of services as a constitutional obligation;
- Convenient and easy to use;
- As affordable as possible; and
- Of a predetermined standard, meaning that services should be suitable for their purpose and be on time; and
- Be safe and be available continuously.

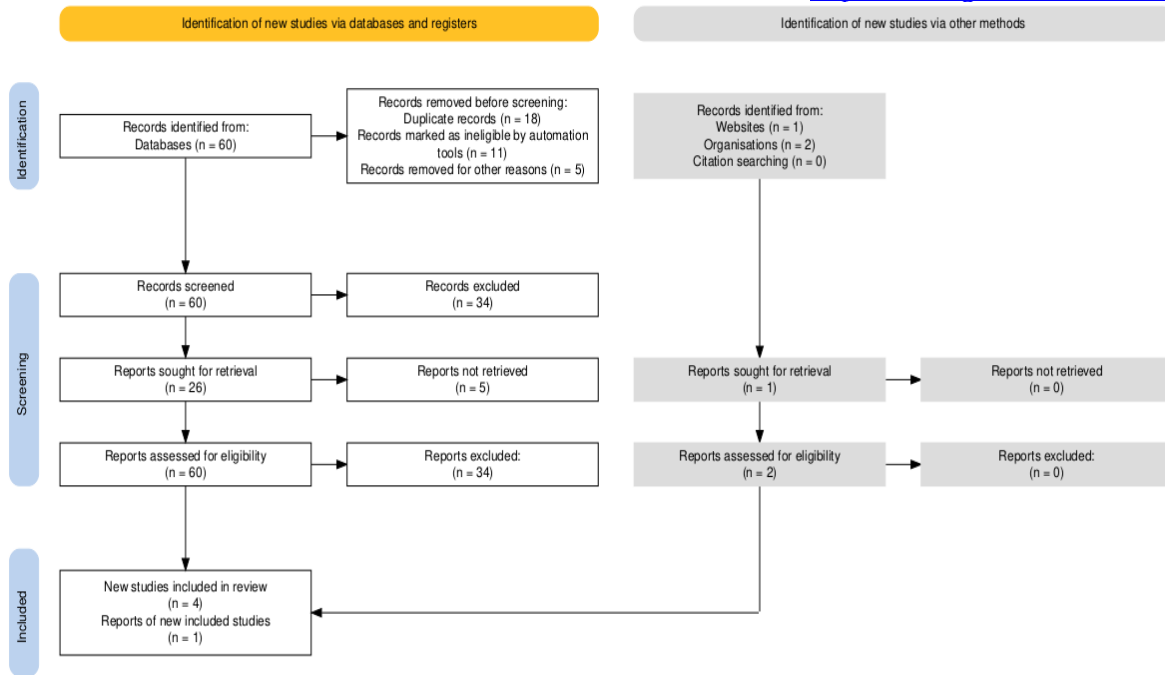
Given these mandates by the White Paper (1998), South African local government still faces systemic challenges in fulfilling its constitutional obligations, including delayed service delivery (Madumo et al., 2019; Mamokhere, 2022). StatsSA (2024) outlined that President Cyril Ramaphosa initiated the District Development Model (DDM) in 2019 to address these issues, highlighting the lack of coherence in planning and implementation. To address poverty, inequality, and employment, Ramaphosa called for a new integrated district-based approach that localizes procurement and job creation, promotes local businesses, and involves communities. This approach addresses poor service delivery, poverty, inequality, and employment while promoting local businesses and community involvement (StatsSA, 2024).

This study aims to critically examine the contemporary factors contributing to municipal service delivery conundrums in South Africa, focusing on how governance failures impact essential services such as water supply, sanitation, electricity, and waste removal.

3. Research Methods and Materials

This study utilized qualitative research methodology through a scoping review. Peters et al. (2021) indicated that a scoping review is a systematic method of evidence synthesis that maps existing literature on a broad topic or field, providing an overview of available research, identifying key concepts, and highlighting knowledge gaps. It is an exploratory approach that focuses on identifying evidence types, clarifying key concepts, and understanding research conducted within a field.

The systematic process includes defining the research question, searching for relevant literature, selecting studies, and synthesizing findings. Data charts are often used instead of statistical synthesis, creating a descriptive summary of the evidence. Scoping reviews offer greater flexibility regarding evidence types, including primary research, reviews, policy documents, and other types of information. Page et al. (2020) indicated that the PRISMA extension for scoping reviews was published in 2018. Figure 1 below presents the PRISMA-ScR adopted in this study.

**Figure 1.** PRISMA-ScR

Source: Own Compilation using Shinyapps.io Software. https://estech.shinyapps.io/prisma_flowdiagram

Preparation and Database Search

In this study, the preparation begins by reading government reports and news to understand the extent of service delivery delay. As part of the preparation, the researcher then hypothetically assumed factors that cause service delivery delays. The topic of the study was inspired by the ongoing protests triggered by poor service delivery in South African municipalities. The research then started with a search for relevant studies. The keyword search initially produced 60 research outputs from the 5 different databases. In the database search, the researcher only considered each database's first ten (N=10) research outputs. Google, Google Scholar, DOAJ, and IBSS indices were used to search for relevant information. The data collection process was guided by these specific keywords, including "service delivery delay," "municipal governance," and "South African municipalities." These keywords facilitated comprehensive searches of relevant literature across various databases. The research outputs include journal articles, book chapters, government reports and internet sources. After screening the research studies, reports and internet sources, the author was left with twenty-six (N=26) sources eligible for citations in this study. The duplications and other irrelevant studies totalling thirty-four (N=34) were removed from the study. Table 1 below presents the inclusion and exclusion criteria followed in this scoping review.

Establishing the Inclusion and Exclusion Criteria and Selection of Relevant Studies

In this study, the author intentionally reviewed 60 studies, including journal articles, book chapters, government reports, and internet sources, to determine whether the inclusion and exclusion criteria were satisfied. Table 1 below presents the inclusion and exclusion criteria.

Table 1. Inclusion and exclusion criteria

	Inclusion criteria	Exclusion criteria
Year of Publication	Studies and reports published from 2012 to 2025	Studies and reports published before 2011.
Quantity	The study retrieved 60 research outputs, of which 26 were cited.	Out of the 60 studies, 34 were excluded due to ineligibility.
Type of research outputs	Peer-reviewed journal articles, book chapters, government reports, and internet sources on service delivery conundrums in South Africa were considered.	Non-peer-reviewed journal articles, conference proceeding papers, commentaries, book reviews, published theses, dissertations, and editorial documents were excluded.
Document language	Documents written in English	Documents not published in English.
Study area	The study only considered articles, reports, and internet sources focused on South Africa.	Studies focusing on countries other than South Africa were excluded.
Relevance of studies	The first 60 studies on service delivery conundrums in South Africa were identified. The relevance was identified through abstracts for journal articles, while the reports and internet sources were read fully.	The research studies are not relevant to the topic being studied.

Source: Own compilation

Data Analysis Process

This study's data analysis followed a scoping review model, systematically mapping key concepts and findings. First, data was collected from academic databases, government reports, and internet sources. Second, inclusion and exclusion criteria were applied to filter relevant studies. Third, thematic analysis was conducted to identify recurring patterns in service delivery challenges. Fourth, data was charted into governance, financial management, and infrastructure categories. The findings of this study are further discussed in the results and discussion section.

4. Results**The Conceptualization, Contextualization and Status Quo of Service Delivery**

StatsSA (2024) indicated that service delivery involves providing crucial public services, including clean water, waste management, healthcare, education, and infrastructure development. Reliable access to safe water and sanitation is fundamental to human life, well-being, and dignity, serving as a cornerstone of an improved quality of life. Delivering these services plays a vital role in reducing poverty and inequality. As the primary driver of basic service provision, local government ensures access to essential services and fosters development by directing economic resources to enhance citizens' lives. While municipalities often manage service delivery directly, they also collaborate with community organizations or private entities through contracts or privatization. Despite significant advancements in service provision over recent decades, access remains uneven across and

within municipalities due to variations in population size, economic development levels, and infrastructure demands (StatsSA, 2024). The study by Ragolane & Malatji (2024) highlighted that the City of Johannesburg, between 2012 and 2019, faced concerns about insufficient water availability, high costs, and poor sanitation services. The City of Johannesburg has improved basic services like water tanks and chemical toilets, but around 133,540 households still lack electricity. Challenges such as illegal connections, cable theft, and vandalism require constant maintenance and upgrading. Waste management faces financial constraints, leading to illegal dumping in rural and informal settlement areas. The housing crisis has led to informal settlements, overcrowded hostels, and homelessness. Poor road conditions require rehabilitation, and housing is a significant problem, with long waiting periods and poor-quality designs (Ragolane & Malatji, 2024). The study further explores the state of access to basic service delivery using census data between 2011 and 2022.

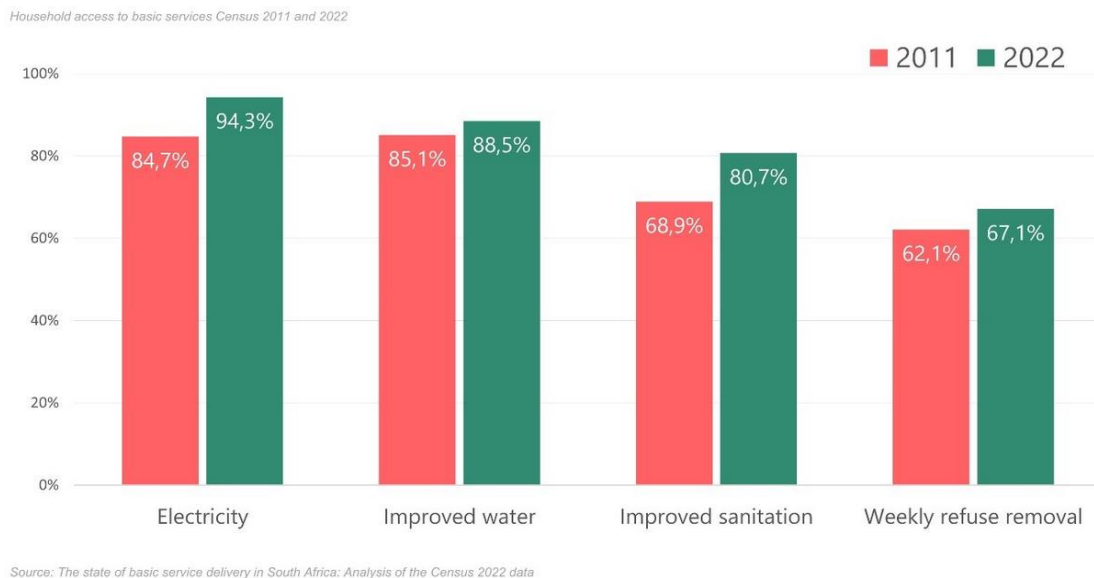


Figure 2. Household access to basic services, census 2011 and 2022

As illustrated in Figure 2, a scale from 0 to 5 measures service availability, where 0 indicates no services, and 5 represents full provision. Between 2011 and 2022, access to essential services improved significantly. Census data shows that access to clean water rose from 85.1% to 88.5%, while improved sanitation increased from 68.9% to 80.7%, highlighting a decade of progress in service delivery. The report *The State of Basic Service Delivery in South Africa: Analysis of the Census 2022 Data*, published by Statistics South Africa, further indicates that weekly refuse removal grew by five percentage points to 67.1% in 2022, while access to electricity increased by 9.6 percentage points to 94.3%. Despite the significant strides made since 1994 in enhancing the quality of life for South Africans by expanding basic services, particularly in rural and informal settlements, the remaining service backlogs pose the most significant challenges.

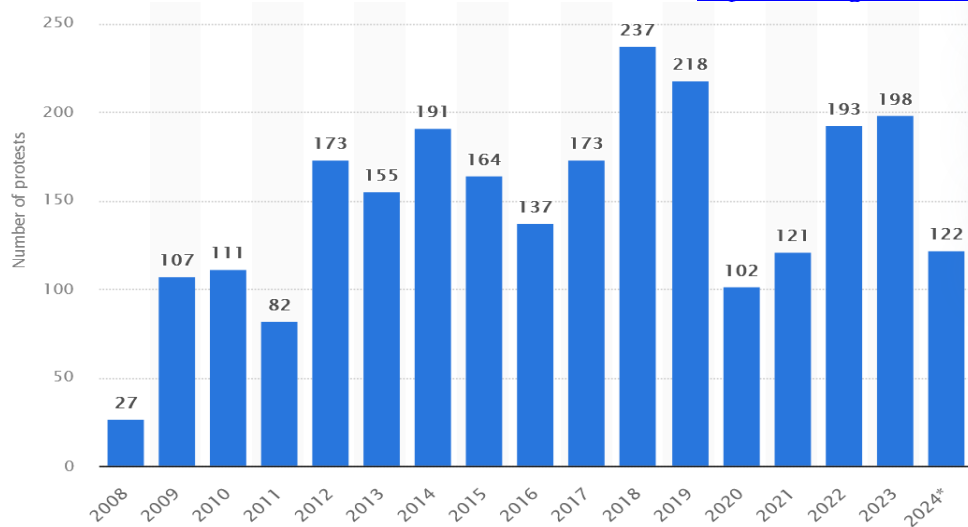


Figure 3. Number of service delivery protests in South Africa from 2008 to 2024

Source: Statista (2025)

The inadequate service delivery has amplified violent protests across the country (Matyana et al., 2022; Yende, 2025). In 2024, South Africa experienced 122 service delivery protests, reflecting ongoing challenges in municipal service provision. Historically, the number of such protests has fluctuated, peaking at 237 in 2018, mainly due to political events like the controversial cabinet reshuffle by then-president Jacob Zuma (Statista, 2025). By June 2024, 38% of these protests were attributed to electricity or water issues, marking an increase from 24% in the previous month.

While rolling blackouts ceased as of March 2024, water supply problems persisted due to poor infrastructure and corruption (Statista, 2025). Mamokhere & Kgobe (2023) indicated that this surge underlines persistent issues in basic service delivery, particularly concerning electricity and water services. Similarly, Xolani, Mkhize & Mlambo (2022) stated that the consistent occurrence of these protests highlights enduring deficiencies in municipal service delivery in South Africa, emphasizing the need for substantial improvements in infrastructure and governance to address citizens' concerns effectively. Yende (2025) states that South Africa's violent protests are a response to service delivery failures like inadequate housing, sanitation, and clean water.

These protests cause devastation, injuries, and loss of life, eroding trust between communities and authorities. The government's inability to address these disparities triggers a cycle of unrest, disrupting stability and hindering development in the country.



Figure 4. Evidence of prevalent service delivery protests in South Africa

Source: Own Compilation

In terms of Figure 3, it is evident that service delivery in South Africa is a critical issue, with unreliable government services causing inconvenience and endangerment. As a result, protests demanding better service delivery have increased, dominating local politics and often leading to violence. The term "service delivery protest" has become a media catch-all.

Factors Contributing to Service Delivery Delays

The study of Matyana & Sibiyi (2025) implies that South Africa's local governments face numerous challenges in service delivery, including bureaucratic inefficiencies, insufficient resources, and systemic corruption, which hinder their ability to provide essential services to communities. The section examines the factors leading to service delivery delays within South African municipalities. The main factors are summarized in Table 2 below and discussed in further detail:

Table 2. A summary of factors contributing to service delivery delays

Factors	Applied Research Methodology	Type of Document (e.g., Journal)	Sources
Bureaucratic inefficiencies and other ineffectiveness, e.g., poor planning, lack of skilled personnel, and bureaucratic red tape.	Qualitative (desktop studies)	Journal articles	Mamokhere, 2024; Ragolane et al., 2024; Matyana et al., 2025
Financial constraints, e.g., mismanagement of public funds and low revenue collection	Qualitative and PRISMA Model	Journal articles	Mishi et al., 2012; Chauke et al., 2024.
Political-administrative interface, e.g., Patronage networks influencing resource allocation.	Qualitative and Semi-structured interviews	Master's dissertation and Government Report	Mathonsi, 2025; AGSA, 2021
Lack of institutional capacity and resources. E.g., Aging and inadequate infrastructure, management and staff capacity.	Qualitative and Semi-structured interviews, desktop study	Journal articles	Khambule & Mtapuri, 2018; Mamokhere, 2024
Lack of community participation	Qualitative and Semi-structured interviews	Journal articles	
Systemic Corruption	Qualitative (desktop studies)	Journal articles	Laubscher, 2012; Matyana & Sibiya 2025

Source: Author's compilation

5. Discussion

In South Africa, service delivery protests are mainly due to administrative inefficiencies in municipal governance. Poor planning and coordination among departments cause delays in project implementation and ineffective responses to community needs. This leads to dissatisfaction with essential services like water supply, waste management, and road maintenance. High staff turnover and bureaucratic red tape also contribute to the issue. Many municipalities struggle to retain qualified professionals due to poor working conditions, inadequate salaries, and political interference (Mamokhere, 2024). This results in inconsistent service delivery and frustration among communities. Protests often arise when citizens feel unheard or when promised developments are delayed (Ragolane et al., 2024). Mishi, Mbaleki, & Mushonga (2022:1) stated that "local governments are considered an essential part of interpreting and integrating laws and policies at the local level. There is a growing realization that the success of local government is vital to alleviating poverty and delivering services to communities. However, financial mismanagement as per audit reports has affected several local authorities and continues to hinder progress". Laubscher (2012) stated that municipalities face financial limitations due to mismanagement of budgets, poor financial planning, low revenue collection, and dependency on national funding. This leads to inefficient allocation of funds, delays, and incomplete projects. Low revenue collection and over-reliance on national funding also weaken financial sustainability. Corruption and irregular expenditure further drain resources, affecting infrastructure development and maintenance, worsening living conditions, and fueling public discontent (Laubscher, 2012; AGSA, 2021; Chauke et al., 2024).

Mathonsi (2025) advocates effectively separating public service from politics to fulfil its developmental mandate. Overly political interference in public service can hinder the state's obligation to provide crucial services to the

people. Depoliticizing public services can contribute to the well-being and advancement of the populace. The data shows that political interference negatively impacts basic service provision in Johannesburg, which is exacerbated by the chopping and changing political leadership due to the coalition government arrangement. Therefore, the state should depoliticize public services to enhance the well-being and advancement of the populace (Mathonsi, 2025). Equally, the Auditor General of South Africa (AGSA) (2021) identifies poor financial management, governance, oversight, and leadership as the main reasons for poor financial performance in municipalities. Political interface in administration strains relations between key officials, causing many municipalities to struggle financially.

Additionally, municipalities often plan for failure, preparing unfunded budgets based on unrealistic revenues and expenditures rather than preparing credible budgets approved by councils. This results in unfunded and unsustainable financial practices (AGSA, 2021). According to Matyana & Mthethwa (2022:1125), “the lack of community participation in local government affairs results in poor service delivery and inconsistencies. Winnie Madikizela Mandela Local Municipality experiences huge service delivery inequalities, which cause harm to its inhabitants because the living conditions are unsuitable. Each municipality in South Africa is mandated to provide equal services to its communities”. Khambule & Mtapuri (2018) and Mamokhere (2024) stated that municipalities often lack the necessary infrastructure, financing, and personnel to effectively plan, implement, and maintain basic services like electricity, water, and sanitation. This lack of strong institutional structures and qualified staff hinders strategic decision-making, project management, and service provision oversight. This lack of capacity and resources leads to inefficiencies, delays, and an inability to meet citizens' needs. Competent and skilled staff within municipalities can also contribute to these issues.

Enhancing Service Delivery in South Africa

The study acknowledges that improving service delivery in South Africa requires many collaborative approaches that strengthen local government efficiency (Thusi et al., 2024). One crucial strategy is capacity building, which focuses on training municipal staff to enhance their ability to plan, implement, and monitor service delivery projects. Well-trained personnel contribute to more effective governance and improve public services (Mamokhere, 2024). The study of Molobela (2025) suggests that South Africa should acquire adequate ICT skills and infrastructure to enhance its public service delivery, as digital technology presents a transformative opportunity to replace traditional manual systems and improve public interaction. Technological integration is also vital, as digital platforms facilitate better citizen engagement, while data analytics enables informed decision-making. Embracing modern technology can streamline processes, enhance transparency, and improve overall service delivery efficiency. Additionally, the White Paper on Local Government (1998) encourages strong partnerships between municipalities, the private sector, non-governmental organisations, and community-based organizations that can help mobilize resources, share expertise, and ensure services align with community needs.

The study also acknowledges a need to revise the policy framework, which is essential for addressing local governance inefficiencies. The proposed revision of the 1998 White Paper on Local Government presents a significant opportunity to rectify systemic challenges that have hindered municipal effectiveness over the past 30 years of democracy. Updating this framework can ensure more responsive local governments that efficiently deliver essential services such as water, sanitation, and electricity. Furthermore, strengthening financial management will enhance fiscal responsibility, transparency, and sustainability, ensuring that municipal budgets are utilized effectively. A renewed focus on community engagement is also critical, involving residents in decision-making through consultations and participatory governance. Municipalities can better address local needs and foster public trust in government institutions (Department of Cooperative Governance and Traditional Affairs, 2025). Lastly, Kikasu & Pillay (2024) indicated that the 2024 elections have sparked a Government of

National Unity (GNU), which aims to improve service delivery at the local level. This government can introduce legal and institutional reforms to combat corruption, simplify bureaucratic processes, and strengthen local government accountability. It can also attract international investment and provide municipalities with additional resources to enhance service delivery. Strategic reforms and collaborative efforts will create more accountable, efficient, and sustainable local governments, ensuring long-term socio-economic development in South Africa.

Conclusions and Recommendations

This study found that service delivery delays in South African municipalities are a worrying issue, impacting community well-being and public trust in local governance. Key conundrums include administrative inefficiencies, financial mismanagement, political-administrative interference, and infrastructural limitations. These factors create a complex landscape that requires urgent intervention. To address these challenges, a multifaceted approach is needed. Strengthening capacity-building programs for municipal employees will enhance governance efficiency, while transparent financial management systems will curb corruption and ensure responsible use of public funds. Encouraging public participation in decision-making will foster accountability and align services with community needs. Leveraging technology for tracking and monitoring service delivery can enhance efficiency while establishing robust accountability mechanisms. Implementing these recommendations can significantly improve service delivery, restore public confidence in local governance, and drive sustainable development as required by the Constitution of the Republic of South Africa, 1996.

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POLICY OPTIONS IN ACCELERATING CIRCULAR ECONOMY ADOPTION IN THE GULF COUNTRIES

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Abstract. The transition to a circular economy is a pivotal step for the Gulf Cooperation Council (GCC) countries, given the growing environmental challenges, scarce resources, and the urgent need to diversify economies away from hydrocarbon dependence. This paper presents a comprehensive analysis of policies to accelerate the adoption of the circular economy in the Gulf countries based on a multi-dimensional analytical framework encompassing Social, Technological, Economic, Environmental, and Political (STEEP) aspects. Drawing on consultations with regional experts and specialized researchers, numerous case studies, and global best practices. The study reviews a set of proposed policies to accelerate investment in the circular economy in the Gulf countries. These include various tools such as investment in clean technology, strong political support, and the establishment of circular funds. It also reviews the challenges and outcomes of recycling, stimulates legislation, and reduces traditional consumption patterns. The study also presents a "causal loop diagram" (CLD) highlighting the dynamic interactions and feedback influencing the transition to a circular economy. The findings emphasize the importance of aligning regulatory policies, providing financial incentives, developing circular infrastructure, and enhancing community awareness. The study concludes by proposing six actionable policy options constituting a roadmap tailored specifically to the Gulf context, contributing to integrating circular economy principles into national development strategies. It contributes to the sustainable development literature by proposing realistic and effective policies that enable Gulf countries to lead in circular innovation and low-carbon growth. It further contributes to the growing discourse on sustainable development by offering actionable, context-sensitive policy recommendations for fostering a resilient and circular Gulf economy.

Keywords: Circular Economy; Gulf Cooperation Council (GCC); Policy Options; STEEP; Sustainability

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1. Introduction

The Gulf Cooperation Council (GCC) countries (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates) face numerous challenges in their economic and environmental development due to their long-

standing reliance on fossil fuel revenues. This reliance has positioned them as global energy suppliers (Nassar, 2024; Ijaz et al., 2025). However, the finite nature of fossil fuels, coupled with increasing environmental pressures, necessitates reconfiguring their economic models (Abid et al., 2024; Balushi & Yusoff, 2025). As a result of these pressures, these countries have started moving toward a circular economy, although they are still in the early stages, facing structural, cultural, and political barriers (Binsuwadan et al., 2023). The circular economy has become a new and inspiring approach to sustainable development. Rather than sticking to the old linear economic model of "take, make, dispose" that has ruled industrial societies for ages, the circular economy seeks to create a regenerative system where the resources are reused, recycled, and repurposed to cut down on waste, boost efficiency, and preserve economic value over time (Corona et al., 2019; Hartley et al., 2023).

The circular economy concept attracts the increasing attention of governments, scholars, companies, and citizens as a necessary step to achieve sustainable development (Ghisellini et al., 2015; Rezk et al., 2024). With the rapid economic growth of GCC, rising populations, and increasing environmental concerns, there has been a noticeable shift towards more sustainable practices, including the embrace of the circular economy (Al-Saidi et al., 2021; Shiva, 2024). The circular economy has emerged as a new approach geared toward achieving sustainable development, serving as an alternative to the old linear economic model of "take, make, dispose" that dominated industrial societies for ages (Stahel, 2016). This involves extracting raw materials, using them to manufacture products, and selling them to consumers, who discard them as waste after a single use. This is a polluting system that leads to the degradation of natural ecosystems and resource scarcity, and it is a driving force behind global challenges such as climate change and the loss of biodiversity (Torcătoru et al., 2022; Abdirahman et al., 2025).

The circular economy differs from linear economic systems by adhering to three core principles: eliminating waste and pollution, extending the use of materials, and regenerating natural ecosystems. Practical applications of these principles include extending product lifecycles, remanufacturing, and promoting sharing economies (Komyshev et al., 2024; Imtihan et al., 2025). This model focuses on retaining resources in the economy for as long as possible and minimizing waste generation by designing long-lasting, durable, repairable, and upgradeable products. It also involves remanufacturing using secondary raw materials and waste extracted from existing products, recycling them into new products, disassembling worn-out items, repairing them, and reintroducing them to the market, ultimately extending their lifecycle, preserving raw materials, and creating added value (Raksha, 2025). This added value benefits producers by reducing the cost of purchasing raw materials for new products, even if more materials are used to make the products more durable. For consumers, the benefit lies in accessing goods at lower prices. Environmental and societal benefits include reduced greenhouse gas emissions, decreased waste, and the restoration of ecosystems. Recently, the concept of the circular economy has gained growing attention from governments, scientists, businesses, countries, and citizens as a necessary step toward achieving sustainable development (Rezk et al., 2024; Wang et al., 2024).

Many countries have adopted specific circular economy strategies and have developed numerous plans and programs to encourage participation in the circular economy and move away from the linear model (De Lange, 2024; Wang et al., 2024). Amid rapid economic growth, population increase, and rising environmental concerns, a noticeable shift has emerged in the Gulf countries toward more sustainable practices, including adopting the circular economy (Andersson et al., 2023). According to the 2019 World Government Summit report, the GCC countries can achieve savings of \$138 billion by 2030 if they adopt circular economy models, roughly equivalent to 1% of the cumulative GDP of the GCC countries from 2020 to 2030. The report also confirmed that under the current traditional economic model followed by Gulf countries, there would be an accelerated depletion of resources and the generation of unprecedented levels of waste and emissions, resulting in social, economic, and environmental damage (Anouti et al., 2019).

The Gulf Cooperation Council (GCC) countries face many challenges that could hinder their transition to a circular economy. The rapid urbanization in Gulf cities, with an 85% increase in the urban population (Arif & Aldosary, 2023), is leading to a significant rise in waste generation rates. In some Gulf countries, such as Qatar and Kuwait, waste rates exceed 1.5 kg per capita per day, burdening waste management systems heavily (Mariyam et al., 2024). Additionally, the Gulf countries suffer from water scarcity, increasing reliance on desalination, an energy-intensive process that pressures natural resources (Saif et al., 2014). One of the factors complicating the adoption of a circular economy is the heavy reliance on migrant labour in these countries, which requires energy subsidies averaging \$140 billion annually in the Gulf (Sanfilippo et al., 2024), along with the lack of investment in necessary recycling infrastructure, as less than 10% of municipal waste is recovered (Ibrahim et al., 2022).

Despite many challenges, the GCC countries have several opportunities that could contribute to accelerating the adoption of a circular economy. One such opportunity is the significant investments made by the Gulf countries in clean technologies, such as renewable energy and advanced recycling, with investments in this sector expected to reach \$250 billion by 2025 (Alnaser & Alnaser, 2011). Moreover, the youth population in the GCC, which constitutes 70% of the population under the age of 30, represents a major source of innovation and expresses growing demands for sustainability, indicating significant potential for developing circular economy practices (Binsuwadan et al., 2023). Various studies, such as those analyzed by Ateba and Enwereji (2024), Doshi (2023), and Mason (2023), emphasize the continuing role of hydrocarbons in the economies of GCC countries despite increasing efforts toward economic diversification. Many studies highlight how oil and gas revenues continue to shape the region's political economy, creating a delicate balance between global decarbonization pressures and domestic economic demands. Oil and gas, more or less still being the main factors shaping economic policies, call for adaptive strategies to join renewable energy policies with geopolitical and economic contexts unique to the Gulf regions.

As one of the great petrochemical players in the Gulf, SABIC, in Saudi Arabia, is set to effectively mirror and map out a government road towards carbon neutrality come 2021, with 2050 as the target date. Energy efficiency, renewable energy, electrification, carbon capture, and green and blue hydrogen are included among the pathways. Like this, Aramco has recently introduced several initiatives to create a framework for a low-carbon circular economy and develop technological capabilities for carbon dioxide capture and geologic storage. Emissions have been converted into added value by capturing carbon dioxide and blending it with hydrocarbon feedstock to create clean, high-value products in the consumer and industrial sectors (Jodai et al., 2024). In Bahrain, several initiatives have been adopted to achieve short-term goals of reducing emissions by 2035 and achieving carbon neutrality by 2023. Bahrain also aims to achieve a circular carbon economy by 2060. Since 2009, Bahrain has established a BHD 52 million carbon dioxide recycling plant to convert it into economic products. This plant recovers 450 tons of carbon dioxide per day from the chimneys of the Gulf Petrochemical Industries Company, which is used to enhance methanol production by 80 tons per day (Sumra et al., 2025).

Meanwhile, the United Arab Emirates has launched the Circular Economy Policy 2021-2031, a comprehensive framework that outlines the country's approach to achieving sustainable management and efficient use of resources by adopting consumption and production methods and technologies. Another important project is the establishment of the UAE Circular Economy Council, which is primarily responsible for developing a mechanism for implementing circular economy policies, adopting performance indicators, encouraging private sector participation, promoting and developing studies and research, and enhancing international cooperation (Yasmin et al., 2023; Lara et al., 2025).

Qatar also works to guide the circular economy principles in line with Vision 2030. The Integrated Waste Sorting and Recycling Program and the Second National Development Strategy encourage using approximately 20% recycled materials in construction projects and waste as fuel, the first project of its kind in the GCC. The country currently produces about 30 megawatts of electricity at its solid waste treatment centre. Like other GCC countries, Qatar's population is concentrated in cities and is expected to reach about 90% by 2050 (Earthna, 2023). Qatar has invested in building cities and regions that embrace the circular economy concept, such as Lusail and Msheireb Downtown Doha, as part of its sustainability plans. The Supreme Committee for Delivery & Legacy in Qatar estimated that around 2,000 tons of waste removed from the 2022 World Cup stadiums were recycled, 80% of which was recycled. At the same time, 90% of the waste from one stadium was used in constructing the new stadium itself (Invest Qatar, 2022).

The CE initiatives in Oman, under the direction of the Oman Environmental Services Holding Company, offer 12 investment opportunities in waste management and circular economy, amounting to OMR 528 million. These projects will create an electronic waste recycling program, a waste-to-energy facility, and recycling motor oils, glass, copper, and used cooking oils (Oman Observer, 2022). In addition, Kuwait commits to becoming carbon neutral by 2060 and seeking carbon neutrality in the oil and gas sector by 2050. More needs to be done to transition to a circular economy that sustains the environment and economy, with the number of circular economy plans, initiatives, and programs in the GCC (Adebayo et al., 2024). This paper aims to examine the current status of the circular economy in the Gulf countries by analyzing the challenges they face, reviewing global best practices in this field, and presenting a set of policies and measures that can effectively contribute to accelerating the implementation of circular economy practices and achieving environmental and economic sustainability in these countries.

2. Methodology

This research utilizes a qualitative methodological framework to evaluate and design policies that will promote the circular economy in the GCC. The research design uses a literature review, expert interviews, and stakeholder workshops to utilize what is known. The literature review provides the foundation to explore global circular economy practices and their relevance for developing policies in the GCC. To ensure suitability for each policy, various stakeholders, including environmental NGOs, academics, and community representatives, were consulted to gain firsthand information about barriers, opportunities, and actors' roles in catalyzing the transition to a circular economy in the GCC. Data analysis is a two-part, interrelated process: a STEEP analysis and Causal Loop Diagram (CLD) development, which are all systematic ways of analyzing the circular economy situation in the GCC and informing policy. The STEEP (Social, Technological, Economic, Environmental, and Political) analysis framework was employed to analyze qualitative data from interviews, workshops, and the literature review.

The results from this multi-dimensional analytical approach constituted five domains or pillars for reporting purposes: social (i.e., cultural attitudes and societal awareness), technological (i.e., clean technology adoption), economic (i.e., transition costs and large investments), environmental (i.e., waste streams and resource scarcity), and political (i.e., regulatory frameworks and policy momentum). The analysis makes it possible to assess instruments for sustainable energy adoption in the GCC critically. Using the above-outlined documented analysis, a comprehensive causal loop diagram (CLD) was generated that captured balancing and reinforcing feedback loops, including policy momentum and transition costs. The CLD is used to visualize and visualize the dynamic interconnections across the STEEP domains and to demonstrate opportunities for policy intervention at critical anchors about data. Finally, based on this documentary analysis, the research presents specific policy recommendations contextualized for the Gulf and reviewed by key experts.

3. STEEP analysis of circular economy in Gulf countries

STEER analysis is a strategic tool used to assess the external factors affecting the circular economy in Gulf countries. It encompasses social, technological, economic, environmental, and political dimensions. This analysis provides an understanding of the opportunities and challenges of adopting a circular economy in the GCC.

3.1. Social factors

The countries in the Gulf region have been growing their populations over time, as shown in Figure 1, with consistent and significant growth in the GCC countries from 2005 to 2023. Based on World Bank data, Saudi Arabia and the UAE have maintained the largest absolute populations, roughly 35.4 million and 9.9 million, respectively, in 2023. Indeed, Qatar and the UAE have also demonstrated the steepest relative increases from the 2005 level; Qatar grew its population from 0.8 million to 2.9 million (over 3 times larger), while the UAE increased its population from 4.1 million to 9.9 million, more than doubling its 2005 figure. The GCC areas grew from around 35.7 million in 2005 to over 58.5 million in 2023, or a 64% increase in just under 20 years. This demographic increase is mainly attributable to labour migration, with expatriates making up over 85% of the UAE's population and 89% in Qatar (WorldBank Data, 2024). Such diverse demographics bring varied consumption patterns and levels of environmental awareness that will affect the adoption of circular economy (CE) actions.

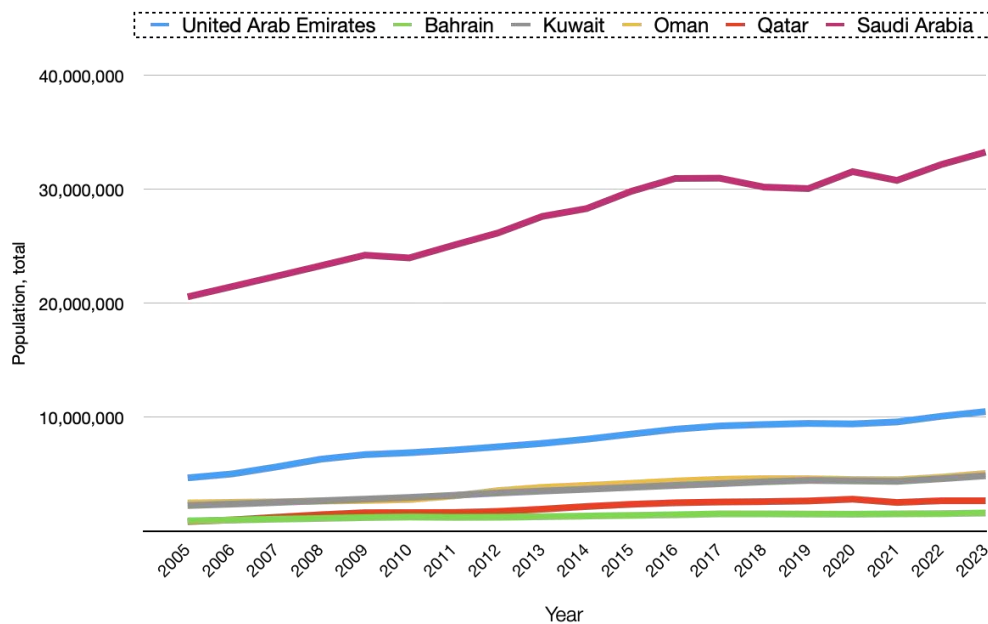


Figure 1. Population Growth of Gulf Countries

Source: GCC-Stat, 2022

Population growth will continue to place increasing demands on resource consumption and waste systems. In 2022, household waste was a significant proportion of municipal solid waste in the GCC. Based on official data (GCC-Stat, 2024), it was estimated that the residential sector generated approximately 31.4 million tons of non-hazardous waste, approximately 75% of the total non-hazardous waste generated in the region. As shown in Table 1, GCC countries' per capita household waste generation rate varied considerably, with an average estimated

generation rate of 1.0 kg and 1.8 kg per capita per day in 2022. Oman had the steepest per capita contribution from households at around 1.5 kg per capita per day, which reflects high consumption behaviour and a strong opportunity for circular effects interventions. Saudi Arabia and the UAE had reductions in per capita household waste generation from 2017 of 16.9% and 17.5%, respectively, indicating that national household waste generation reduction campaigns and efforts to shift the awareness of consumer behaviour are starting to show results.

In comparison, Bahrain and Oman saw the per capita household waste generation increase by 20% or more. These trends emphasize the need to shift towards a circular economy, which targets household behaviour, enhances waste separation at source, and nurtures a culture of reuse and repair. The data is also encouraging by demonstrating that some countries are making the right strides, showing that the right interventions can bring about real and quick change in implementing circular economy principles at the societal level.

Table 1. Per Capita Household Waste Generation in GCC Countries (kg/day)

Country	2017 (kg/day)	2022 (kg/day)	Change (%)	Trend
Kuwait	1.1	1	-0.052	Decrease
Bahrain	1	1.1	0.21	Increase
Oman	1	1.2	0.204	Increase
UAE	1.6	1.3	-0.175	Decrease
Qatar	1.2	1.4	0.072	Increase
Saudi Arabia	2.1	1.8	-0.169	Decrease

Source: GCC-Stat, 2024

3.2. Technological factors

Waste-to-Energy (WtE) technology development is critical to circular economy strategies in the GCC. Table 2 shows that the UAE, Saudi Arabia, Kuwait and Oman have committed a sizeable amount of funds to convert municipal waste into clean energy through WtE projects. For example, the Al Warsan plant in Dubai, one of the largest operational WtE plants across the region, can process municipal waste at a capacity of 1,825 kt/year and is equipped with 185 MW of installed power. Sharjah, Abu Dhabi and Kuwait also have WtE projects which range in power levels from 30 – 100 MW, demonstrating the ongoing capability of the respective technologies. There is also the demonstration of continuing momentum within Oman, whose 50 MW WtE facility opened in 2023, and Saudi Arabia has set an overall national objective of 3000 MW of WtE by 2030, which indicates a longer-term objective regarding technological advancement with the efforts of the Vision 2030 and Circular Carbon Economy regulations. These projects also highlight the advancement of technology readiness and a shift away from landfills into energy recovery. Advancement that can positively impact waste management objectives and emissions reduction initiatives.

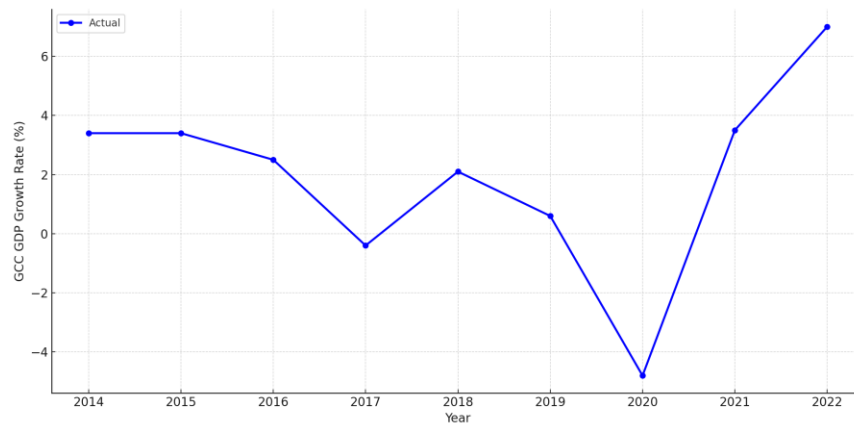
Table 2. Waste-to-energy projects in Gulf Cooperation Council (GCC) countries

Country	Project	Capacity (kt/year)	Installed Power Capacity (MW)	Cost (Million USD)	Operational Year
UAE	Sharjah	300	30	220	2020
	Sharjah (Sajja area)	400	80	—	—
	Ras Al Khaimah	—	2	32	—
	Dubai (Al Warsan)	1825	185	545	2020
	Abu Dhabi	—	100	850	—
Bahrain	Askar	390	25	480	—
Kuwait	Kabd	1195	100	756	—
Oman	—	803	50	750	2023
Saudi Arabia	National Target (2030)	—	3000	—	2030 (target)

Source: Alsabbagh (2019)

3.3. Economic factors

The Gulf Cooperation Council (GCC) economies actively diversify to minimize their dependence on oil revenue, reinforcing their circular economy ambitions. In 2023, the growth rate of the non-oil sector of the economy grew by 3.3%, while the oil sector declined by -4.8% due to OPEC production cuts. This change reflects a growing concentration on developing sectors such as manufacturing, tourism, and services, which are all relevant for embedding circular economy practices. As depicted in Figure 2, the GCC has showcased a lot of volatility in GDP growth from 2014 to 2022, especially during the pandemic period in 2020, when the GCC faced a severe contraction of -4.8%. However, the economic resilience and recovery of the region are exemplified by the robust GDP rebounds of 3.5% in 2021 and 7.0% in 2022 (GCC-Stat, 2024).

**Figure 2.** GCC GDP Growth Rate at Constant Prices (2014–2022)

Source: GCC-Stat, 2024

As shown in Figure 3, Gulf countries such as Saudi Arabia, UAE, Kuwait, and Qatar provide energy subsidies—primarily for oil, gas, and electricity. For example, Saudi Arabia allocates almost 90 billion USD of funding, with most subsidies on gas and electricity. Although Kuwait has a much smaller economy relative to Saudi Arabia, it is a meaningful contributor to the theme of energy subsidies, demonstrating that energy subsidies, when reviewed from a national economic perspective, represent around 9% of Kuwait's GDP, which is meaningfully high under the context of its economy (IEA, 2023). These subsidies are a cost to the national budget, and they are a barrier to efficiency and moving toward sustainability. Energy subsidies not only hide the actual comparative cost of energy in the economy; they suppress research and development of innovations and the private sector's interest in investigating alternative and circular economy options or solutions. Reducing energy subsidies from the national budget and re-investing this funding into circular economy interventions like renewable energy, waste-to-energy projects, water reuse, and sustainable manufacturing can cultivate long-term economic resiliency.

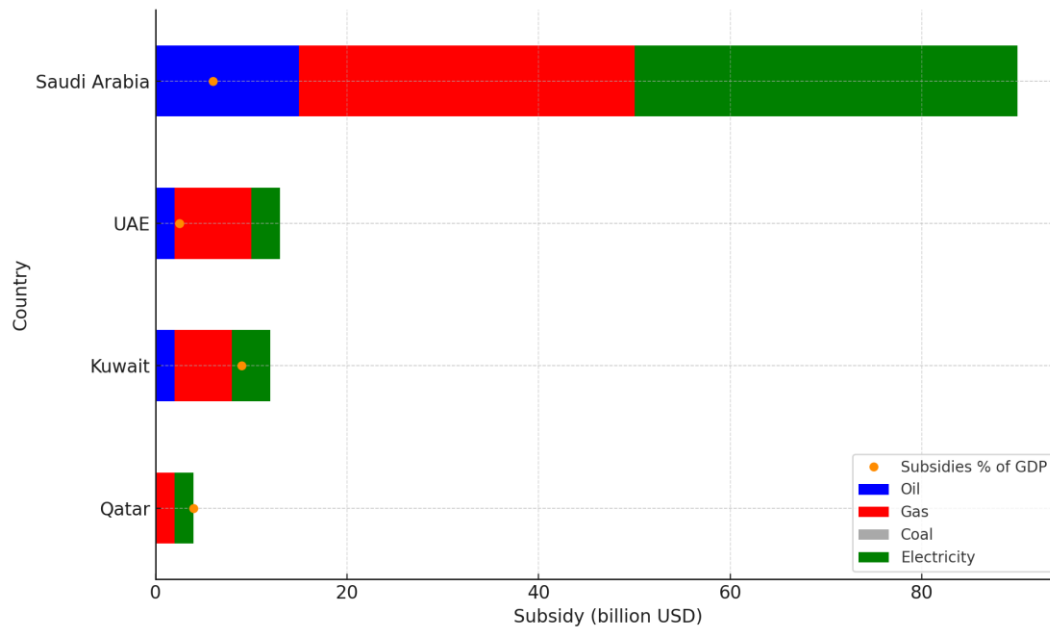


Figure 3. Energy Subsidies in Gulf Countries
Source: IEAm 2023

3.4. Environmental factors

Waste recycling performance is a critical indicator of environmental progress in transitioning to a circular economy. According to the most recent data, GCC countries exhibit substantial disparities in their recycling rates of non-hazardous waste (Figure 4). In 2022, the United Arab Emirates led the region by a wide margin, with 94.5% of treated non-hazardous waste processed through recycling, a significant jump from 83.6% in 2020. This illustrates the considerable investment made by the UAE in terms of infrastructure related to waste treatment operations, as well as policy-based diversion activities. At the same time, other GCC countries either showed a flat line or a steep decrease. For example, Saudi Arabia's recycling rate decreased from 6.7% in 2020 to 1.3% in 2022, and Kuwait from 6.7% to 2.1%. Qatar, Bahrain, and Oman had rates less than 1.5% in 2022 (GCC-STATa), which shows a clear need for improved integrated waste management systems, public-private recycling partnerships, and a national diversion target to recover materials.

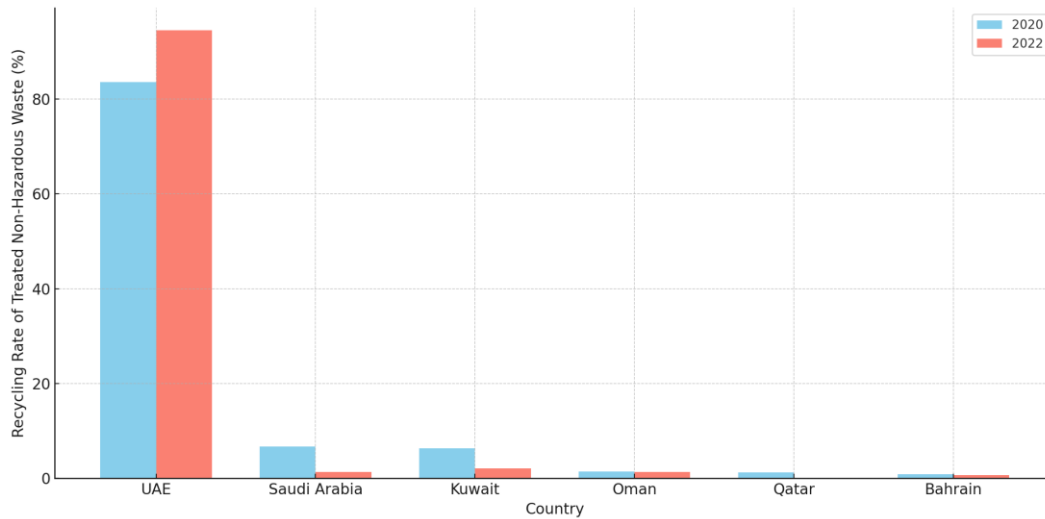


Figure 4. Recycling Rates of Non-Hazardous Waste in GCC Countries (2020 vs 2022)

Source: GCC-Stat, 2024

Despite the high aspirations for sustainability policies, the amount of renewable energy consumed for energy across the GCC is exceedingly low. At best, renewables provide just 1.4% of total final consumption energy across the GCC. This indicates that the region continues to rely on fossil fuels for energy and a pressing need to increase investments in clean energy infrastructure substantially. As displayed in Table 3, the current use of renewables remains low. Bahrain (0.04%), Kuwait (0.2%), Qatar (0.5%), and Saudi Arabia (0.8%) fall into the lowest range of the scale; however, several GCC countries have publicly stated they have strong ambitions for renewables to be part of their total energy portfolio by 2030, such as Saudi Arabia's goal of 50%, and UAE's goal of 30%. Although these broad national goals suggest some will shift towards greener systems, the UAE is the first Gulf state to implement a climate policy direction with a 7.0% renewable share in 2022. The rates of renewable energy consumption and broader climate ambitions are also inconsistent in terms of climate ambitions that link closely to net-zero commitments. Countries, for the most part, begin their net-zero commitments by pledging carbon neutrality levels by 2050 or 2060, with Qatar as the only GCC country that is without a formal net-zero or carbon-neutral timeline, indicating a real gap in space going forward for long-term climate plans.

Table 3. Renewable Energy Share, Targets, and Net-Zero Commitments in the GCC

country	Renewable Share 2022 (%)	Target for 2030 (%)	Net-Zero Commitment
Saudi Arabia	0.80%	50%	2060 (in policy)
UAE	7.00%	30%	2050 (in policy)
Oman	1.60%	30%	2050 (in policy)
Qatar	0.50%	20%	No target
Kuwait	0.20%	15%	2060 (pledge)
Bahrain	0.04%	10%	2060 (pledge)

Source: Sanfilippo et al., 2024

Transitioning to renewable energy is critical from a circular economy viewpoint. It represents the foundational energy model necessary for decarbonizing supply chains, energizing low-emission industries, and allowing for circular manufacturing and distribution. The significant gap between the 2022 baseline and the targets set for 2030 reflects the lack of rigorous deployment, policy implementation, and regionally-convened effort needed to translate commitments into tangible outcomes and realize the full benefits of circular systems.

3.5. Political factors

Gulf Cooperation Council (GCC) member countries increasingly align their national development agendas with circular economy principles to improve sustainability and encourage regional economic diversification. National plans, such as Saudi Vision 2030, Qatar National Vision 2030, and Oman Vision 2040, specifically include circular economy objectives to convey a regional pivot away from resource-heavy linear economics and towards a multi-dimensional approach to sustainability.

The United Arab Emirates' Circular Economy Policy 2021–2031 and the Circular Carbon Economy proposition presented by Saudi Arabia when it was president of the G20 group of the world's most economically powerful nations articulate a strong political commitment to develop a foundation for a circular economy as part of long-term development. In the UAE, programs like the National Sustainable Consumption and Production Plan (2019–2030) and the Scale 360 initiative developed in conjunction with the World Economic Forum exist, and some of the GCC programs also mention collaboration and innovation, public-private partnerships, and efficiency in energy, food, and manufacturing systems. Additionally, in Saudi Arabia, which has a clear National Waste Management Strategy, the Vision 2030 reform framework outlines the strategy's goal to divert 82% of waste from landfills to other uses, including composting and circular production, with buy-in from the Saudi Investment Recycling Company (SIRC) and National Center for Waste Management (MWAN). The National Waste Management Strategy was also recently updated in 2020.

Other Gulf countries are also taking steps; Bahrain established a CO₂ recycling plant and set long-term carbon neutrality targets. Kuwait is establishing net-zero commitments by sector. Qatar is integrating circularity into national infrastructure plans. Oman spearheads sustainable industrial change through Vision 2040 (Adebayo *et al.*, 2024; Sumra *et al.*, 2025). In addition to OmanVision 2040, planned investments of \$250 billion in clean and circular technologies in the GCC are also anticipated by 2025 (Alnaser & Alnaser, 2011). While there has been expansion in these areas, it is essential to note some challenges.

These challenges include the fragmented regulatory enforcement mechanisms, the pushback of institutional inertia, stakeholder reluctance, and the continued expansion of oil-based revenue aspirations (Doshi, 2023; Mason, 2023). Overall, these are positive developments with different sources of policy shifts across the Gulf region toward a more circular, low-carbon future economy. However, the positive effect of these initiatives will depend on sustained investment and cross-border alignment.

4. Circular economy transitions in the GCC: a causal loop analysis of systemic drivers and barriers

This research reflects the system dynamics associated with the Gulf Cooperation Council (GCC) transition to a circular economy (CE), as presented in Figure 1. This figure aids in capturing the different interrelated factors, feedback loops, and external circumstances that affect the pace and direction of CE in the GCC. Important variables that are incorporated into the system dynamics models include resource efficiency (or maximize output to minimize input), waste (or total waste creation from industrial, commercial, and domestic activities), recycling infrastructure (or facilities to sort and/or process materials), and policy support (or regulations to support CE). Beyond the variables we discussed, we also want you to think about other key factors, such as public awareness, economic diversification, investment in green technology, reliance on oil, transition costs, and market demand in the global marketplace.

The three reinforcing loops (R) frame the acceleration element. R1 (Policies & Infrastructure Growth) shows us how strong policy support leads to greater investments in recycling infrastructure, directly increasing resource efficiency and reducing waste. This further justifies more policy support in the future, particularly under Saudi Vision 2030 or the UAE's Circular Economy Policy 2021-2031. R2 (Awareness and Participation) outlines how public education initiatives increase participation rates in recycling initiatives, improving waste reduction efforts and monitoring efficiency while increasing awareness, for example, Qatar's waste management programs. R3 (Economic Diversification and Green Tech) explains how diversification approaches promote green tech investment, creating efficiencies and revenues that further justify the need for diversification. The Masdar initiative in the UAE and the ambitious green hydrogen strategy in Oman are particularly noteworthy movers in this loop.

Conversely, there are three key balancing loops (B) that function to undermine this phase of sustainability transitions. B1 (Oil Dependency Resistance) illustrates how dependency on fossil fuel exports dampens the appetite for investments in CE, reducing available resources for action and slowing infrastructure development, particularly in Kuwait and Bahrain. B2 (Cost of Transition) highlights the high upfront costs associated with investments in infrastructure and training that inhibit action on policies that attempt to incentivize investment and, thus, on stagnation and waste continuing to occur, particularly in countries with limited budgets. Finally, B3 (Weak Global Market Pull) captures how the weak global demand for sustainable products from the GCC weakens incentives to innovate and develop green infrastructure and ostensibly strengthens economic reliance on oil.

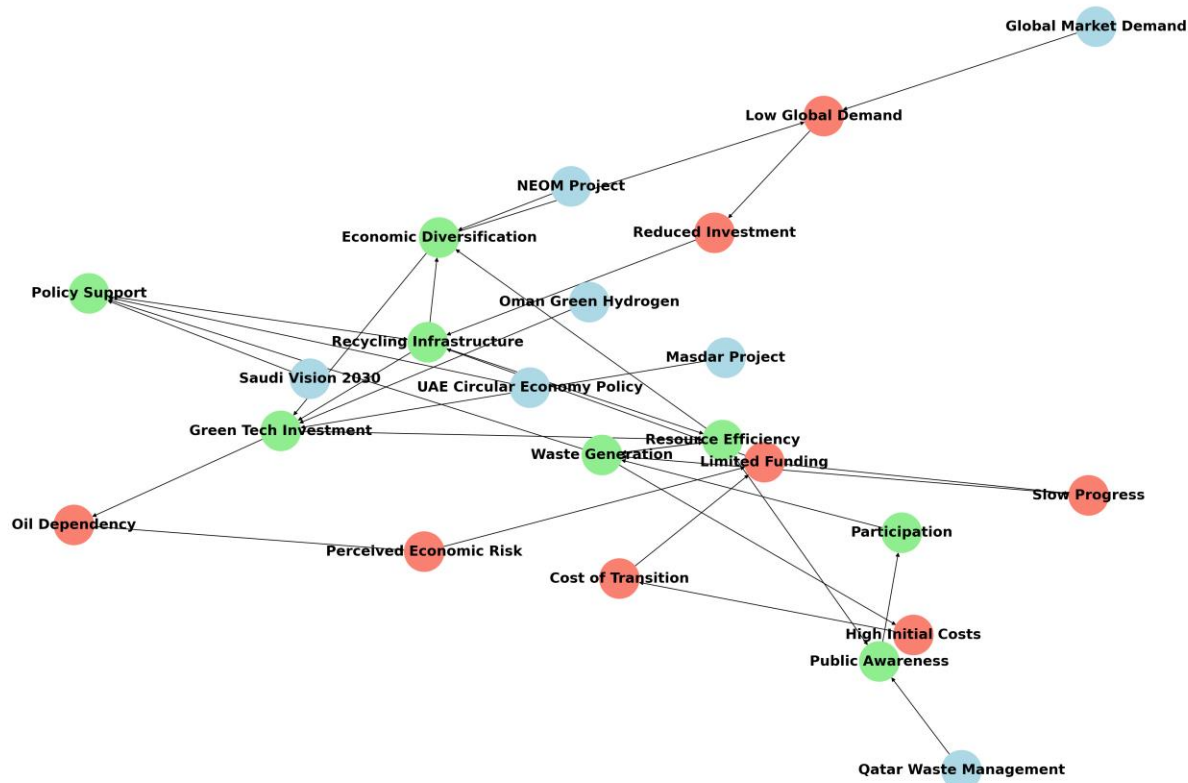


Figure 5. A causal loop analysis of systemic drivers and barriers

Figure 5 shows these loops do not exist in a vacuum—they operate within a complicated, dynamic system of interacting forces. Reinforcing loops such as R1 and R3 could offset balancing forces operating against national development visions. Challenges such as B2, however, will remain in place until addressed by upfront market valuation subsidies or international partnerships. A leverage point is public education/engagement (reinforcing loop R2) and global engagement into new green market opportunities to offset B3. Regionally, GCC states like UAE and Saudi Arabia show greater prospects to navigate these dynamics given the momentum around economic diversification than Kuwait or Bahrain, which are navigating more stifling structural constraints. Ultimately, the GCC transition to a circular economy is directed by a non-linear, interacting matrix of forces. Progress can be made through amplifying positive feedback mechanisms for policy, public engagement, and innovation and targeting to limit systemic backlash (tied to economic demand). Plans must be holistic and context-specific to shift the status quo toward systemic sustainability.

5. Policy options to accelerate the adoption of circular economy in Gulf countries

As Gulf countries grapple with increasing environmental challenges such as diminishing natural resources, waste management problems, and increased carbon emissions, a clear opportunity exists to pursue sustainable economic development via a circular economy approach. A circular economy minimizes the reliance on finite resources and promotes the development of innovation, jobs, and environmental protection. The following six policy options provide a pathway to enhance and speed up the adoption of circular economy policies in the GCC, where each policy option will cover an overview of the policy action, description of policy action, main key players to employ the policy, and best practice for each policy option.

5.1. Policy option # 1: strengthen regulations on waste management and recycling

This policy proposes a comprehensive framework of regulatory and incentive measures. It suggests that Gulf governments set ambitious recycling targets, including a minimum recycling rate of at least 50% by 2030, with higher allocations for priority materials, such as plastics (60%), e-waste (75%), and metals (85%). These targets are coupled with an integrated Extended Producer Responsibility (EPR) system that requires Gulf manufacturers to take full responsibility for the lifecycle of their products, including post-consumer products, with progressive fees imposed on non-recyclable materials and deposit systems for packaging. The policy also includes a timeline for phasing out single-use plastics in the Gulf region, starting with a complete ban on plastic bags by 2030 and ending with a ban on all non-recyclable packaging by 2032.

To incentivize vendors, fines of up to 10% of sales will be imposed on violators, and certifications of excellence and financial incentives will be granted to compliant facilities. The incentive package includes financing up to 30% of the costs of recycling systems, tax exemptions of up to 25%, and preferential treatment for these types of projects in government tenders. The supportive incentive package includes financing up to 30% of recycling systems costs, tax exemptions of up to 25%, and favourable treatment of these projects in government tenders. This policy anticipates a positive impact of 40% reduction in municipal waste volume and 60% reliance on landfills (i.e., disposal) while creating 100,000 new jobs in the circular economy sectors by 2030. Table 4 includes policy measures for the implementation of this option.

Table 4. Main policy actions for strengthening regulations on waste management and recycling policy

Policy Action	Description of policy action	Main Key Players	Best Practice
Enforce Mandatory Extended Producer Responsibility (EPR) Laws	Enforcing Mandatory Extended Producer Responsibility (EPR) laws means requiring producers to take full responsibility for the environmental impact of their products throughout their entire lifecycle.	Governments, Manufacturers, Waste Managers	In the European Union, Extended Producer Responsibility (EPR) is enforced through key laws like the Waste Electrical and Electronic Equipment (WEEE) Directive (2012/19/EU) and the Packaging Waste Directive (2018/852/EU), both aimed at boosting recycling and holding producers accountable for their product's end-of-life impact. (Elisabetta Ceroni, 2024).
Set and Enforce Material-Specific Recycling Targets by 2030	The governments will define clear recycling goals for different waste types—60% for plastics and 75% for e-waste—to be achieved by 2030.	Municipalities, Industry Associations	The European Union has established ambitious recycling targets to advance its circular economy objectives. Under the Waste Framework Directive, member states must recycle or prepare for reuse at least 60% of municipal waste by 2030 and 65% by 2035. Additionally, the Packaging and Packaging Waste Directive sets a target to recycle at least 70% of all packaging waste by 2030. (Domenech & Bahn-Walkowiak, 2017)

Policy Action	Description of policy action	Main Key Players	Best Practice
Introduce deposit return schemes for bottles/containers	Implement a system where consumers pay a small deposit when purchasing beverage bottles or containers, which is refunded when they return the empty packaging.	Governments, Retailers, Beverage Companies	Norway's bottle deposit scheme has achieved a 97% recycling rate for plastic bottles, setting a global benchmark for effective circular waste management (Rachel Cooper, 2018)
Implement a Ban on Single-Use Plastics (bags by 2025, all non-recyclables by 2032)	Introducing legislation to phase out plastic bags by 2025 and eliminate all non-recyclable single-use plastics by 2032.	Environment Agencies, Retailers	Through a phased ban approach, France reduced plastic bag usage by 85% over five years (2015–2020), showcasing how gradual regulation paired with public education can effectively drive sustainable behaviour change. (Cowan et al., 2021)

5.2. Policy option #2: incentivize circular business models through financial tools

This policy proposes a comprehensive package of financial instruments to address the unique demands faced by the industrial and commercial sectors of the Gulf countries. These include a multi-tier tax exemption structure starting at 15% for companies that implement minimum sustainability requirements, with the exemption level gradually increasing to 30% for top-tier companies that achieve excellence in sustainable design (e.g., using at least 80% recycled material or using design principles that achieve zero waste rates in manufacturing). The policy also proposes to establish a regional circular finance fund to provide necessary cash liquidity for the transition to circular economy business models, with an acceptable initial capitalization of not less than \$1 billion. The fund could provide a broad package of financing products (like zero-interest loans for up to five years aimed at project launches that recycle waste into commodities) and possibly government guarantees of up to 60% of the total loan amount in support of the work of commercial banks in the relevant economic sector. The fund would also include a special credit line to support new and existing small and medium-sized enterprises needing circular economy transition financing with reduced guarantees.

Finally, in support of significant investments, the policy would require a "smart green bond" product offering that strictly relies on blockchain technology to ensure total transparency in tracking environmental impact documents. 20% of the proceeds will be allocated to establishing regional centres of excellence specializing in developing advanced solutions for recycling complex and composite materials, such as carbon fibre and demolition waste. The policy allocates a package of applied research grants ranging from \$500,000 to \$1 million for universities, research centres, and startups developing revolutionary business models in the circular economy to stimulate innovation. Continued funding requires knowledge sharing and technology transfer to at least five local companies. Table 5 shows the policy actions needed to apply this policy option.

Table 5. Policy actions for incentivizing circular business models through financial tools policy

Policy Action	Description of policy action	Main Key Players	Best Practice
Introduce Tiered Tax Exemptions (15-30%) for Circular Economy Initiatives	Providing tax benefits at different levels based on a company's circular performance, such as using recycled materials, designing recyclable products, or reducing waste to incentivize businesses to adopt more sustainable and circular practices.	Governments, Tax Authorities, Corporations	Sweden has successfully implemented a tax deduction scheme for repair services, allowing individuals to claim 50% of labour costs (up to €2,500 annually) as a deduction from taxable income (Orange, 2017)
Establish a Circular Economy Fund	Creating a dedicated financial resource to support circular economy initiatives	Central Banks, Investors	Australia's BG Planet Ark Circular Future Fund is spearheading the nation's transition to a circular economy with an ambitious \$1 billion funding target by 2030. (Hollands, 2025)
Launch Blockchain-Tracked Green Bonds	Issuing green bonds (a bond where the funds are used exclusively for environmentally friendly projects) and tracking them using blockchain technology.	Financial Institutions, Tech Firms	By the end of 2022, EU general governments had issued green bonds totalling €266 billion in face value, representing 1.7% of the EU's GDP (Eurostat, 2023).
Allocate a Specific Percentage of Government Procurement to Circular Products	Allocate a fixed percentage of government procurement budgets to circular products to promote sustainable markets and support the circular economy.	Governments, Procurement Agencies, Suppliers	Amsterdam invested €150 million in circular procurement, with 32 municipalities and two regional governments pledging to progressively adopt circular purchasing—targeting 10% by 2022, 50% by 2025, and full implementation in the future (OECD, 2020).

5.3. Policy option # 3. Create Public-Private Partnerships for infrastructure development

This option is based on a strategy to build an integrated circular economy infrastructure through effective public-private partnerships in the Gulf countries. The first step is to create a network of waste-to-energy (WTE) plants utilizing advanced technologies such as thermal gasification and pyrolysis that convert waste into renewable energy with an efficiency of up to 80% while eliminating harmful emissions by up to 95%. It also requires the development of advanced recycling facilities using artificial intelligence and robotics to sort electronic, plastic, and textile waste with an accuracy of up to 95% and creating integrated material recovery facilities (MRFs) to recover and recycle valuable materials.

These initiatives would be funded using new financing options like build-operate-transfer (BOT) contracts with tax and customs incentives for participating companies to build and operate the plants. Performance standards must be established to ensure each new facility/plant meets the operational quality and efficiency standards. Table 6 identifies the policy measures required to develop this policy option.

Table 6. Policy actions to create Public-Private Partnerships for infrastructure development policy

Policy Action	Description of policy action	Main Key Players	Best Practice
Establish Waste-to-Energy Plants with 80% Efficiency	Convert non-recyclable waste into electricity or heat, reducing landfill use and supporting sustainable energy generation.	Governments, Energy Companies, Municipalities	In Korea, replacing coal with municipal solid waste for electricity generation has led to a notable reduction in carbon dioxide emissions, estimated at around 230,000 tons (Cui et al., 2024).
Develop AI-Powered Recycling Facilities for Enhanced Efficiency	Developing AI-powered recycling facilities means using artificial intelligence to automate the sorting and processing of waste.	Tech Providers, Waste Sector	ZenRobotics, based in Finland, utilizes AI-powered robots to sort industrial and construction waste, significantly enhancing the efficiency and quality of recycled materials. (ZenRobotics, 2025)
Create Industrial Symbiosis Parks for Advancing Circular Economy	Creating industrial symbiosis parks involves clustering businesses together so that the waste or by-products of one company become resources for another.	Industry Clusters, Planners	The eco-industrial park in Kalundborg, Denmark saves the city €24 million annually while reducing 635,000 tons of CO ₂ , conserving 3.6 million m ³ of water, saving 100 GWh of energy, and eliminating 87,000 tons of solid waste (engieimpact., 2025).
Establish Material Recovery Facilities through BOT Contracts	Establishing material recovery facilities via BOT (Build-Operate-Transfer) contracts involves private companies designing, building, and operating waste recovery facilities for a set period, after which ownership is transferred to the government.	PPP Contractors and Investors	The Xiamen MSW plant in China operates under a Build-Operate-Transfer (BOT) agreement between Alee and the Xiamen Municipal Government. Alee invested RMB 206 million and will operate the facility for 25 years, processing 500 tons of municipal solid waste daily, with payments based on the actual waste handled. (TOMRA, 2016)

5.4. Policy option # 4. Establish circular economy innovation hubs

The policy takes a comprehensive strategy to stimulate innovation and entrepreneurship. Several regional innovation centres are being created to build a circular economy across UAE, Saudi Arabia, and Qatar. These centres aim to develop leading-edge technologies that focus on recovering resources from waste and developing sustainable alternative materials throughout the region, particularly plastic and electronic waste issues. The Gulf Cooperation Council is also asking governments to provide an overall allocation package of funding, including research grants for innovation ideas and partial funding covering 50-75% of the costs to obtain patents. In addition, technology incubators are being formed with leading-edge laboratories, shared office space, and a shared database of contacts of experts/ advisors in sustainable design and materials engineering. The policy also adopts an integrated system to support marketing, including allocating 5% of government procurement to sustainable products. Annual competitions for innovation in the circular economy are also being launched, with significant financial prizes. Table 7 shows the policy actions needed to apply this policy option.

Table 7. policy actions for Establish Circular Economy Innovation Hubs policy

Policy Action	Description of policy action	Main Key Players	Best Practice
Launch Gulf Circular Economy Centers for Regional Sustainability	Establish dedicated centres in the Gulf region to coordinate, support, and promote circular economy initiatives. These centres enhance cooperation between governments, companies, and academia in the Gulf to accelerate circular transformations.	Universities, Startups	Circular Flanders drives circular economy advancement in Belgium's Flanders region. It combines public institutions, businesses, academia, and civil society to form a strong, coordinated network. This collective approach fosters innovation, scales circular solutions, and steers the region toward a low-waste, sustainable economic model. (Circular Flanders, 2024)
Subsidize 50-70% of Patent Costs for Circular Technology	The government or relevant authority would cover 50-70% of the costs of applying for patents related to circular economy technologies.	IP Offices, Inventors	China has actively supported innovation in circular technologies by offering substantial subsidies for patent applications and encouraging research, development, and commercialization of circular technology. (Dang & Motohashi, 2015)
Create Startup Incubators with Testing Labs for Circular Economy Innovation	Shared workspaces with prototyping equipment	Accelerators, Corporations	In early 2023, European startups developing circular economy solutions secured €867 million in funding across 67 deals, highlighting strong investor confidence in sustainable innovation. (Net Zero Insights, 2023).

5.5. Policy option #5: implement educational and public awareness campaigns

This policy employs a multi-dimensional strategy to incorporate circular economy principles within community awareness and education. The policy proposes a National Multimedia Campaign with the tagline "Our Circular Gulf," which includes intensive awareness commercials on traditional and digital media and community workshops within shopping complexes and residential neighbourhoods. The policy also embeds circular economy principles into K12, which begins at the elementary school level with applied learning in sustainability labs and the secondary school with vocational training. Universities will offer advanced educational programs and applied learning programs which require the design of circular business models, modelling of sustainable properties, and sustainable materials engineering, as well as education and training programs available to business owners and employees in the private sector on strategies for environmental design, efficiency of resources and waste management with awarded and recognized professional badges in these new and emerging fields. To promote the sustainable nature of the impact, the policy establishes a National Observatory of Environmental Awareness Indicators so indicators could be collected as measures of organizational behaviour and a system for schools and companies that implemented circular economy strategies and best practices. Finally, an award at an annual event to recognize the best community efforts was designed within the policy to promote circular skills and competency development further. The policy actions are illustrated in Table 8 for implementing this policy option.

Table 8. Main policy actions for Implement Educational and Public Awareness Campaigns policy

Policy Action	Description of policy action	Main Key Players	Best Practice
Run the "Our Circular Gulf" Media Campaign to Promote Circular Economy	Running a national "Our Circular Gulf" media campaign involves launching a public awareness initiative to promote the principles of a circular economy across Gulf countries.	Media outlets, Ministries of Information, Environmental NGOs	San Francisco set an ambitious goal of achieving zero waste by 2020, implementing various initiatives and community-driven campaigns to reduce landfill use and promote recycling and composting. (economic donut, 2023)
Integrate circular economy principles into School Curricula	Integrating circular economy into school curricula involves incorporating concepts of sustainability, recycling, waste reduction, and resource efficiency into educational programs.	Ministries of Education, Teachers' Associations, Textbook Publishers	In Singapore, the Ministry of Education has integrated circular economy concepts into the national curriculum, engaging students with sustainability through interactive lessons, activities, and hands-on projects. (economic donut, 2023)
Offer Vocational Training in Circular Economy Skills	Offering vocational training in circular skills involves providing specialized education and hands-on training in recycling, waste management, sustainable design, and resource efficiency.	Technical Colleges, Industry Associations, Labor Ministries	India is embedding circular economy principles into vocational training programs to equip youth and professionals with hands-on skills that support sustainable jobs and green growth. (Circle Economy, 2024)

5.6. Policy option #6: develop regional circular economy cooperation

Table 9. outlines the main policy actions required to achieve the implementation of the regional circular economy cooperation policy option created. The policy is to develop a unified legislative framework establishing recycling and waste management standards and technical specifications for sustainable products in the Arabian Gulf region. This will facilitate companies running operations smoothly and building a competitive market for green products. It also involves the establishment of a Gulf Circular Economy Fund with an initial capital of \$2 billion to fund projects across borders, joint green bonds, and the Gulf Federation for Circular Economy Research, comprising centres of excellence in sustainable technologies and programs specialized in innovation. It will also create a higher coordination committee at the level of environment ministers and seek to develop a unified measurement (monitoring) system to assess performance and provide periodic reports.

Table 9. Policy actions for the Develop Regional Circular Economy Cooperation policy.

Policy Action	Description of policy action	Main Key Players	Best Practice
Harmonize Recycling Standards Across GCC Countries	Involves aligning recycling regulations, guidelines, and practices across Gulf Cooperation Council countries to ensure consistency and efficiency in waste management.	GCC Secretariat, Regulators	The European Union has enacted new rules to improve packaging sustainability, requiring all packaging to be recyclable, limiting hazardous materials, and reducing excessive or unnecessary packaging. (ESG News, 2024)
Establish a \$2B GCC Circular Economy Fund	Establishing a Gulf Circular Economy Fund involves creating a financial initiative across the Gulf Cooperation Council (GCC) countries to support investments in circular economy projects.	GCC States, Multilaterals	COMESA and the European Union have launched a €40 million regional circular economy programme to support sustainable development, resource efficiency, and green innovation across member states. (Gakunga, 2024)
Develop a Gulf-wide Circular Economy Monitoring Framework	Create a unified system across Gulf countries to measure and track circular economy performance and support sustainable policy decisions	Energy Ministries, Utilities	The European Union's Circular Economy Monitoring Framework, developed by Eurostat, is a global best practice for evaluating circular economy progress and shaping evidence-based policy enhancements across the EU. (Eurostat, 2024)

The policy options demonstrated a robust strategy for advancing circular economy practices in the GCC. The Gulf region can shift towards a more sustainable future and a circular economy by enhancing regulations, providing incentives for circular business models, promoting collaboration between the public and private sectors, establishing innovation hubs, increasing education, and promoting regional cooperation. All the strategies use global best practices to enable the region to tackle its environmental issues while unlocking economic growth and social well-being.

Conclusion

The move toward a circular economy represents an important opportunity for Gulf Cooperation Council (GCC) members to deal with growing environmental pressures, lessen dependence on non-renewable resources, and work towards sustainable, diversified economic development. This study has presented a multi-dimensional analysis through the STEEP framework and causal loop modelling to explain the systemic enablers and barriers to a circular economy in the region. Our findings show that, while there are still structural barriers—such as reliance on fossil fuel, lack of recycling infrastructure, and lack of cohesive regional and national policies—the GCC countries are making progress through national and strategic visions, investments in clean technology, and beginning to develop regulatory frameworks. The six policy options presented in this paper provide a framework to bolster the transition toward a circular economy in the GCC region. The first is to develop waste regulations that acknowledge circular economy aspirations; second, to create business models that incentivize and incentivize business practices that encourage circularity; third, to create public/private partnerships to develop capital infrastructure that supports circularity. The fourth is to establish innovation hubs based on best practices; the fifth is to make education and public awareness to reinforce circular economies; and the final option is to promote and strengthen partnerships within member states of the GCC and between the GCC and other partners. All policy options reflect a reasonable faith effort to enhance positive reinforcing loops experienced globally while addressing systemic barriers such as the cost of transition and resistance to new markets.

For the GCC, adopting a circular economy is not simply an environmental issue but an economic one. By investing in circularity now, the Gulf states can usher in a resilient, inclusive, and low-carbon future for the region. Successfully implementing these policy choices will require coherent governance, regional cooperation, and ongoing commitment from all players: government, the private sector, and civil society.

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**ENTREPRENEURSHIP EDUCATION AS INTERVENING SOLUTION TO YOUTH
UNEMPLOYMENT IN SOUTH AFRICA****Ntise Hendrick Manchidi***Department of Applied Management, College of Economic and Management Sciences, University of South Africa,
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Abstract. Youth unemployment has reached an intolerable level in South Africa (SA) since the advent of the new dispensation that was ushered in by the first democratic general elections in 1994. This high level of unemployment amongst young people is attributed mainly to a lack of entrepreneurship teachings at an early age of schooling. Teaching entrepreneurship subjects at primary schools and creating an entrepreneurship culture in SA has become crucial to motivating learners to become entrepreneurs. Using the qualitative research method, the key aspect of this study is to establish whether encouraging entrepreneurial teaching in primary schools at an early stage will create a culture of entrepreneurship that exposes young learners to entrepreneurial opportunities. A phenomenology was chosen nested in social constructivism to explore the participants' experiences of entrepreneurship culture in primary schools, with twenty-seven participants from five primary schools in the City of Tshwane Metropolitan Municipality (CTMM) purposefully selected in varying categories that include learners, educators, principals, and school governing bodies (SGBs). Face-to-face interviews using semi-structured interview questions captured the participants' lived experiences. Through the descriptive, thematic, and phenomenological data analysis, the findings advise on how primary schools could create an entrepreneurship culture to encourage learners to become entrepreneurs as an alternative career preference by applying three cardinal pillars of extra training for educators on entrepreneurship, allocation of extra time to teach entrepreneurship and incorporating the teaching of entrepreneurship in the curriculum.

Keywords: baseline; entrepreneurship; entrepreneurial culture; entrepreneurship teaching; primary schools; youth unemployment; young learners; teachers; school governing bodies; South Africa

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1. Introduction

Many parts of the world regard entrepreneurship as a beacon of hope to bolster job creation and economic growth, particularly in developing countries. Therefore, these emerging economies have always focused on entrepreneurship as a stepping-stone to economic development. The envisaged incorporation of entrepreneurship education in traditional primary school education is a game changer that challenges educators to enhance and broaden the teaching methods to make entrepreneurship teaching effective and contribute to growing the economy (Bell & Bell, 2020).

The International Labour Organisation (ILO) report states that Africa's population is proliferating rapidly, and its youth have limited income opportunities other than to consider self-employment (ILO, 2019). It is estimated that 85% of young people live in developing economies and that nearly 41 million of these young people are job seekers (ILO, 2020). Along with other developing countries, SA is struggling with youth unemployment and endeavours to mitigate this challenge by initiating the teaching of entrepreneurship in primary school. The country's 2011 Curriculum and Assessment Policy Statement (CAPS), however, indicates that entrepreneurship is taught as a small component of the Economic and Management Sciences (EMS) subject in grade seven (DBE, 2011b). This is contrary to the belief that entrepreneurship at the primary school level creates a culture and

social behaviour that influences learners to become entrepreneurs. The effective creation of an entrepreneurship culture would provide an alternative to youth unemployment and, therefore, should be taught as a stand-alone subject.

A high unemployment rate has characterised the labour market situation in SA for many years, and several reasons drive it. In addition, one of the problems often faced by developing countries is the increase in population growth, which is not controlled effectively in quantity and quality, so it has an impact on increasing the number of unemployed (Yulianti, Chaidir & Permana, 2022). For the most part, the situation in SA originated when the liberation movement in the country, the African National Congress, came to power after the country's first democratic elections in 1994 (Maskaeva & Msafiri, 2021). However, several public policies have been implemented in developed and developing countries, including SA, to foster entrepreneurship and enhance entrepreneurship education (Adeel, Daniel & Botelho, 2023). Entrepreneurship training and education and SMEs' development have a significant positive relationship with job creation, income generation, and poverty reduction (Nor, 2024; Madondo & Tinonetsana, 2024).

Despite entrepreneurship being a national imperative and being at the forefront of the National Development Plan (NDP) 2030 in SA, attempts to steer the plan to reduce youth unemployment failed to inject positive results in increasing employment levels. Accordingly, the Global Entrepreneurship Monitor (GEM) South African Report of 2015/2016 indicates the total early-stage entrepreneurial activity (TEA) rate in the country is lower compared to those countries with a similar economic structure (Herrington & Kew, 2016).

Sadly, the implementation of entrepreneurship education at primary schools faced overwhelming hurdles, such as inadequate educator training, lack of practical teaching of entrepreneurship, and inappropriate teaching methods (Du Toit & Gaotlhobogwe, 2018). For example, even though primary schools in SA offer entrepreneurship lessons, albeit on a limited scale of only 30% in EMS, the need to search for an entrepreneurship culture arises. The rationale is that if learners experience an entrepreneurship culture and can be exposed to entrepreneurship opportunities early, some would be encouraged to consider becoming entrepreneurs, contributing to reducing the negative impact of youth unemployment.

The focus of this study is to investigate the role of primary school education in creating an entrepreneurship culture to inspire primary school learners to become entrepreneurs as an alternative intervention to youth unemployment. The following questions are therefore asked:

1. Are educators well-trained to teach entrepreneurship at primary schools and able to inspire learners to become entrepreneurs?
2. Is there adequate time allocation for educators to teach and create an entrepreneurship culture in primary schools?
3. Are the learners interested and inspired in learning about entrepreneurship, creating a culture of entrepreneurship and becoming entrepreneurs?

2. Literature review

2.1 Entrepreneurship education

Various schools of thought have defined entrepreneurship, and there is still no cohesive definition for this concept in the literature despite being a multi-faceted paradigm (Iwu, Opute, Nchu, Eresia-Eke, Tengeh, Jaiyeoba & Aliyu, 2021). Many African countries continue searching for a solution to how entrepreneurship education should be introduced in primary schools to address youth unemployment and identify obstacles preventing primary schools from teaching entrepreneurship. In doing so, entrepreneurship education (EE) has received the attention of governments, policymakers, and entrepreneurship scholars in the last three decades (Otache, Edopkolor, Sani & Umar, 2024). Encompassing a wide array of methodologies that include causal and linear planning, mindset cultivation, and process-oriented approaches (Gazi, Rahman, Yusof, Masud, Islam, Senathirajah, & Hossain, 2024), EE is seen as one of the tools that can be used to boost the economic contribution of entrepreneurs to global prosperity and development, particularly among women (Padi, Dzisi & Eshun, 2022). The concept of EE plays a significant positive role in promoting economic activities because new firms can overcome the disadvantages related to small size and liability of newness (He, Zheng, Sharma &

Leung, 2024). EE is, therefore, simply an education for improving innovation and creativity skills (Lose & Cheteni, 2024). It is meant to encourage, equip, and give students a thorough understanding of what is needed to become a successful entrepreneur (Davids, Tengeh & Duffett, 2021).

Education is vital to growing both human capital and entrepreneurial capital. However, the orientation and approach of education to build entrepreneurial capital would have to differ significantly (Olutuase, Brijlal & Yan, 2023). Despite its importance, EE in upper secondary education is substantially less researched than in higher education. Many entrepreneurship education review studies are conducted at the university level, while relatively few are performed at the high school level (Lin, Qin, Lyons & Sekiguchi, 2023). It is crucial, therefore, to identify the level at which entrepreneurship education should be initiated to create an entrepreneurship culture. Du Toit and Gaotlhobogwe (2018) believe that entrepreneurship should be introduced from grade one in primary schools, even though the assertions lack specifics on how that should be attained. There is, however, a global need to introduce EE at primary schools as a strategy to reduce youth unemployment and grow economies (Shah, Amjed & Jaboo, 2020).

Though EE in primary schools is still muddled and arguably vague, it is generally considered a contemporary effort to endorse youth start-up businesses and self-employment (Korzhev & Pasko, 2020). The inclusion of entrepreneurship in the primary school curriculum should assist in the creation of an entrepreneurial culture. This phenomenon resembles the application of enterprise behaviours, attributes, and competencies to creating cultural, social, or economic values, which do not exclusively lead to venture creation (Penaluna, 2018). Educators, therefore, only facilitate the entrepreneurship processes to ensure that learners gain the necessary practical entrepreneurship experience and are introduced to problem-solving skills, teamwork, innovation, and creativity while still in primary school, as clearly stated by the curriculum (Cárcamo-Solis et al., 2017). Shekar, Huang-Saad and Libarkin (2019) argue that any entrepreneurship education should focus on the learner; therefore, measuring the impact on the learner is vital.

2.2 Training for educators

Seikkula-Leino and Deveci (2018) believe that entrepreneurship teaching must be done by well-trained experts in the subject's content. Lack of educator training has hampered the implementation of entrepreneurship teaching in primary schools. Therefore, educators need to be skilled and empowered to translate theory into practice so that learners can grasp the concept of entrepreneurship at a precise level of understanding (Dhaliwal, 2016). Creating an entrepreneurship culture depends on a planned programme and educators (Makwara, Iwu, Sibanda, & Maziriri, 2024).

On the other hand, the strong emphasis on educator training in entrepreneurship must be acknowledged. In addition to educator training on entrepreneurship, it is assumed that learners would comprehend entrepreneurship education better if, for example, theory is accompanied by practice as directed by the curriculum (Nani, 2016). Furthermore, the engagement of local businesses in teaching entrepreneurship should inspire learners to be entrepreneurs and subsequently create an entrepreneurship culture (Rothman, 2019).

2.3. Uptake of entrepreneurship education by African countries

Responding to the unstable economy and fewer employment opportunities for graduates, the Ministry of Education in Nigeria and the management of higher education institutions were called to integrate entrepreneurial education into the curriculum (Adelaja, 2021). Adebakin and Alege (2023) believe that learners must be equipped with primary and secondary education to acquire entrepreneurial knowledge, competencies, and skills that will enable them to develop a strong entrepreneurial mindset even before they gain admission to tertiary education. Therefore, Nigeria's educational system needs reform to eradicate its numerous challenges, such as a lack of qualified teachers, inadequate resources, and a lack of focus on entrepreneurship education. Refocusing the educational system towards entrepreneurship education can contribute to economic development, job creation, and fostering creativity, problem-solving, and decision-making skills (Nwaordu, 2024).

Kabonga and Zvokuomba (2021) observe a positive relationship between the choice of entrepreneurship as a career and entrepreneurship education in Zimbabwe. Zimbabwean entrepreneurs' contribution towards entrepreneurship depth was found to be insignificant. As a result, the Zimbabwean entrepreneurship education curriculum ought to be coordinated to feed into primary school to university (Jengeta & Phiri, 2021). The country implements various training programmes, including vocations, apprenticeship, and entrepreneurship, to augment the private sector training offered in entrepreneurship.

Mbazo (2019) believes that the increase in youth unemployment in Botswana could be attributable to the dearth of entrepreneurship teaching. For this reason, young people are found unequipped with the skills and knowledge to start a business, contributing to Botswana's high rate of youth unemployment. The understanding is that if entrepreneurship is not taught in primary schools, young people may find it challenging to own sustainable enterprises, perpetuating the culture of youth unemployment. Dinama, Kelebemang and Olesitse, 2024 assert that introducing the business studies syllabus in senior secondary schools was aimed at equipping learners with entrepreneurial skills for future economic survival.

The impact of business start-up procedures on the relationship between unemployment and entrepreneurship was discovered in Namibia to the extent that the more unemployment increases, the more the procedures of starting businesses are eased. This phenomenon shows an increase in the number of individuals who engage in entrepreneurial activities. However, the ultimate results lead to the complexity of executing the formal processes of business start-ups (Nautwima et al., 2023).

The official unemployment rate in SA stands at 32.1% in the third quarter of 2024 as the youth between 15 to 34 years remain vulnerable in the labour market (Stats SA, 2024). SA, for its part, has since acknowledged, as is the case with other countries in the African continent, that entrepreneurship holds the key to unlocking youth unemployment. However, some uncertainties remain about empowering youth with business skills (Du Toit & Kempen, 2018). The country is amongst those countries with the worst youth unemployment rates in the world, although the unemployment rate for graduates is lower compared to those with low education levels (Maskaeva & Msafiri, 2021). Demand for job creation and unequal distribution of economic power have highlighted a need for young entrepreneurial individuals to serve in South Africa's future economic development (Davids, Tengeh, & Duffett, 2021). The promotion of youth entrepreneurship is one of the possible tools for poverty alleviation and economic growth through job creation of young people (Ahmed & Ahmed, 2021).

2.4 Summary and gaps in the literature

There is a common belief that entrepreneurship education should start early during children's primary schooling and be integrated throughout the education system. In the context of SA, primary schooling refers to grade R to grade 7, and therefore, the appropriate grade at which entrepreneurship education should be initiated is still inexplicable. Furthermore, introducing entrepreneurship education in primary schools has received support from many researchers around the globe. However, the precise guidelines for teaching the subject remain scant. Training of educators is vital to ensure proper skill transfer to learners. Therefore, if educators are not well trained, providing entrepreneurial education to primary school learners will be futile. What is still unclear is the training format educators need to create an entrepreneurship culture in schools and inspire confidence in the learners to become entrepreneurs.

3. Research methodology

3.1 Population and sampling

The population of this study included all grade seven Economic and Management Sciences (EMS) learners aged 13 years and their educators. The population also included selected school principals, School Governing Bodies (SGBs) members, and Department of Basic Education (DBE) officials responsible for curriculum development. A sample was selected from these groups in the education sector of Tshwane (see Table 1).

Table 1. Selection of participants

Selected participants	Name of category
Grade 7 learners	Interviews about the learners' experiences of learning about entrepreneurship at school.
Grade 7 Educators	Interviews about the experiences of teaching entrepreneurship and the challenges they encountered.
The SGB Members	Interviews were conducted to obtain complementary data from the main participants and to determine whether they were satisfied with how entrepreneurship was taught in primary schools for additional clarification of data.
DBE Official	Interviews on curriculum development as well as the rationale for making entrepreneurship an optional subject in grade 7 and a component of EMS, i.e., the justification for the structuring of entrepreneurship education, how it contributed to creating an entrepreneurship culture and why it was an optional subject and 30% only EMS.
School Principals	Interviews on the training of educators and the structure of entrepreneurship as a component of EMS.

Source: Own

The selection of the prominent participants was purposeful and targeted at learners in grade 7 and their educators. In addition, the school principals, members of SGBs and DBE officials responsible for curriculum development were strategic participants interviewed to fill the gaps left by the learners and educators for a better understanding of the findings. The sampling was specific and purposeful in that five schools in different areas of the City of Tshwane Metropolitan Municipality (CTMM), such as farm, township/rural, suburban, and urban, were identified from the DBE website and chosen by the researcher for this study.

3.2 Data collection and analysis

Semi-structured interviews were used for the data collection, and interview questions were used as the data collection protocol. Face-to-face interviews were conducted with all selected participants except the DBE official and four SGB members, who were interviewed by telephone due to their unavailability. Purposive (non-probability) sampling was the selection of participants based on a specific purpose rather than random selection (Babbie, 2018). This method was used to determine and understand whether the schools' environment affects the creation of an entrepreneurship culture. Five participants were chosen from each selected primary school for this study. One school had an extra learner, bringing the number of participants to 26 plus one curriculum developer to make the number 27.

Data was recorded and then verified by participants and transcribed, coded, analysed and interpreted by the researcher to construct information and generate knowledge. Data collected for this study was then analysed using descriptive thematic data analysis as elucidated by Herzog, Handke and Hitter (2019), where data were identified and coded. In addition, Atlas ti 8 – a computer program, was also utilised for additional data analysis.

3.3 Ethical and quality considerations

The Gauteng Department of Education (GDE) granted permission for this study with underage learners and urged the researcher to get permission from the learners' parents; the researcher did obtain signed parental consent. The identities of the schools and all participants were withheld for confidentiality. Selected schools were named using alphabet letters, e.g., School A, B, C, D and E. Learners were numerically identified, e.g., Learner 1, 2,3, etc. Other participants were referred to using their titles, e.g., Principal or educator at school A, B, C, D or E. The principals assisted respective educators from each selected school with identifying eligible learners to participate in the study according to the researcher's specifications relevant to purposive sampling.

Efforts were made to ascertain that the collected data were trustworthy. Trustworthiness entailed credibility, conformability, dependability, transferability, and authenticity. Data were collected from various sources to present credible findings (grade 7 learners, EMS educators, school principals, SGB members, and the DBE official). This triangulation process ensures that data is plausible and a reader finds it believable. For conformity, the researcher remained neutral and objective when interpreting the data to ensure genuine findings. The responses were further referred to participants for corrections and recorded as agreed upon by both the participants and the researcher to ensure dependability. The non-probability sampling was subjective and targeted participants who could express their experiences and feelings about an entrepreneurship culture clearly and unambiguously to yield authentic and transferrable findings.

4. Findings

4.1 Descriptive analysis

All learners who participated in the study were between 11 and 13 years of age (with an average age of 13) and were interviewed in the presence of an educator because they were minors. Four members of the SGB and an official from the DBE were interviewed telephonically due to their busy work commitments; one SGB member was interviewed face-to-face.

Table 2. Demographic profile of participants

Learner participants				
Primary school	Location	Lecturers	Gender	Average age
A	Township/Rural	2	F	13
B	Farm	1	M	13
		1	F	
C	Suburban	1	F	13
		1	M	
		1	F	
D	Suburban	2	F	13
E	Urban (Private)	2	F	13
Total learners	11			
Adult participants				
Primary school	Position	Age	Gender	Qualifications
A	Educator	40≤	F	BA Ed.
	Headmaster	40≤	F	BA Ed.
	SGB Member	40≥	M	Not disclosed
B	Educator	30≥	F	BA Hons. Ed.
	Headmaster	40≤	M	BA Hons. Ed.
	SGB Member	40≤	F	Not disclosed
C	Educator	50≤	F	Dip. Ed.
	Headmaster	50≤	F	BA Hons. Ed.
	SGB Member	50≤	M	PhD in Commerce
D	Educator	30≥	F	BA Ed.
	Headmaster	50≤	F	BA Hons.
	SGB Member	40≤	F	Not Disclosed
E	Educator	50≤	F	BA Ed.
	Headmaster	50≤	M	BA Hons. Ed.
	SGB Member	50≤	F	BA Hons. Soc.
DBE	Official	30≥	M	BA Ed.
Total adults	16			
Total participants	27			

Source: Own

The total number of participants was 27, including 11 learners and 16 adults. Table 2 displays the participants' demographic profiles, excluding personal identities.

Table 3. Frequency of word appearances

Words	Length	Appearance	%	Total	%
Activities	10	8	0.12	8	0.23
Alternative	11	5	0.08	5	0.14
Businesses	10	22	0.33	22	0.64
Concepts	8	5	0.08	5	0.14
Consider	8	6	0.09	6	0.17
Constraints	11	4	0.06	4	0.12
Creating	8	6	0.09	6	0.17
Culture	7	30	0.45	30	0.87
Education	9	12	0.18	12	0.35
Educators	9	31	0.46	31	0.90
Encourage	9	8	0.12	8	0.23
Engineer	8	4	0.06	4	

Entrepreneurship	16	146	2.19	146	0.12
Interesting	11	4	0.06	4	4.24
Knowledge	9	4	0.06	4	0.12
Learners	8	81	1.21	81	2.35
Learning	8	11	0.16	11	0.32
Parents	7	10	0.15	10	0.29
Primary	9	4	0.06	4	0.12
Principals	11	9	0.14	9	0.26
Profit	6	6	0.09	6	0.17
Schools	7	20	0.30	20	0.58
Stand-alone	10	9	0.14	9	0.26
Suburban	8	58	0.87	58	1.68
Teachers	8	5	0.08	5	0.14
Teaching	8	30	0.45	30	0.87
Township/rural	14	29	0.43	29	0.84
Unemployment	12	5	0.08	5	0.14
Youth	5	4	0.06	4	0.12
Total	265	6675	100.00	6675	100.00

Source: Generated by ATLAS ti 8 (2019)

All the words in Table 3 were linked to the research objective and focus on the study: An investigation of the role of primary school education in creating entrepreneurship culture to effectively stimulate primary school learners to become entrepreneurs as an alternative intervention to youth unemployment. Transcribed data, correctly rewritten and orderly organised data (Busetto, Wick & Gumbinger, 2020) were initiated from disorganised codes about mixed-up words and phrases. Raw data collected from the field were broken down in open coding as free codes, words, and phrases identified as applicable to the study. Words such as entrepreneurship, educators, learners and culture, to name a few, were selected from raw data from the field as relevant to the study. Axial coding connected concepts, words, or phrases from open coding into categorised codes, classified into related clusters to make sense and given an identity as a theme.

4.2 Thematic analysis

4.2.1 Creating an entrepreneurial culture

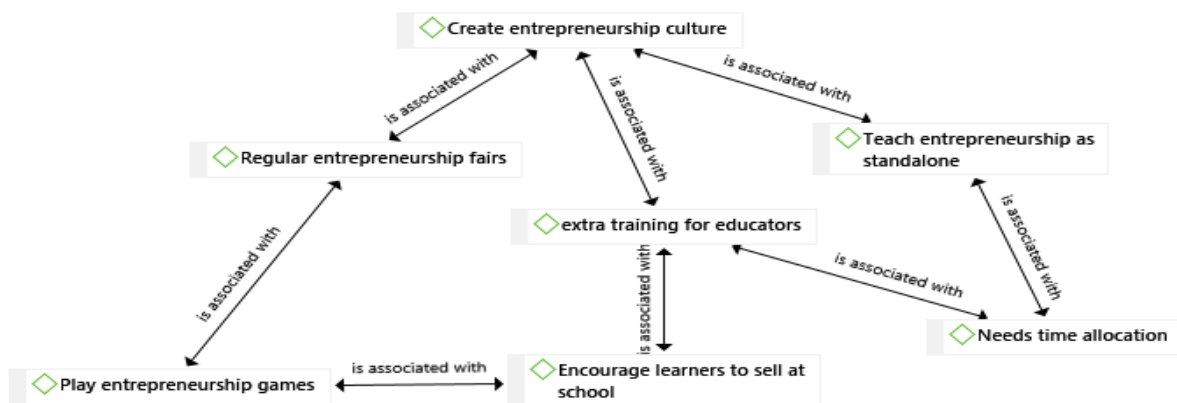


Figure 1. Schematic representation of networks

Source: Generated by ATLAS.ti (2019)

Figure 1 shows how creating an entrepreneurship culture could be achieved by forming networks to link the concepts initiated through data coding. Figure 1 further shows that the creation of entrepreneurship culture is associated with various activities such as regular entrepreneurship fairs, extra training for educators, teaching entrepreneurship as a stand-alone subject, playing entrepreneurship games and encouraging learners to sell at schools. All these activities answer the research questions by reflecting on the study's findings and in line with the conceptual framework. More time is also indicated for the teaching and learning of entrepreneurship. The

data reveals that participants experienced obstacles to creating an entrepreneurship culture at the primary schools.

4.2.2 Perspectives from Learners

Figure 2 summarises the learners' perspective on the interview questions, followed by a detailed description and analysis of the data collected from the learners.

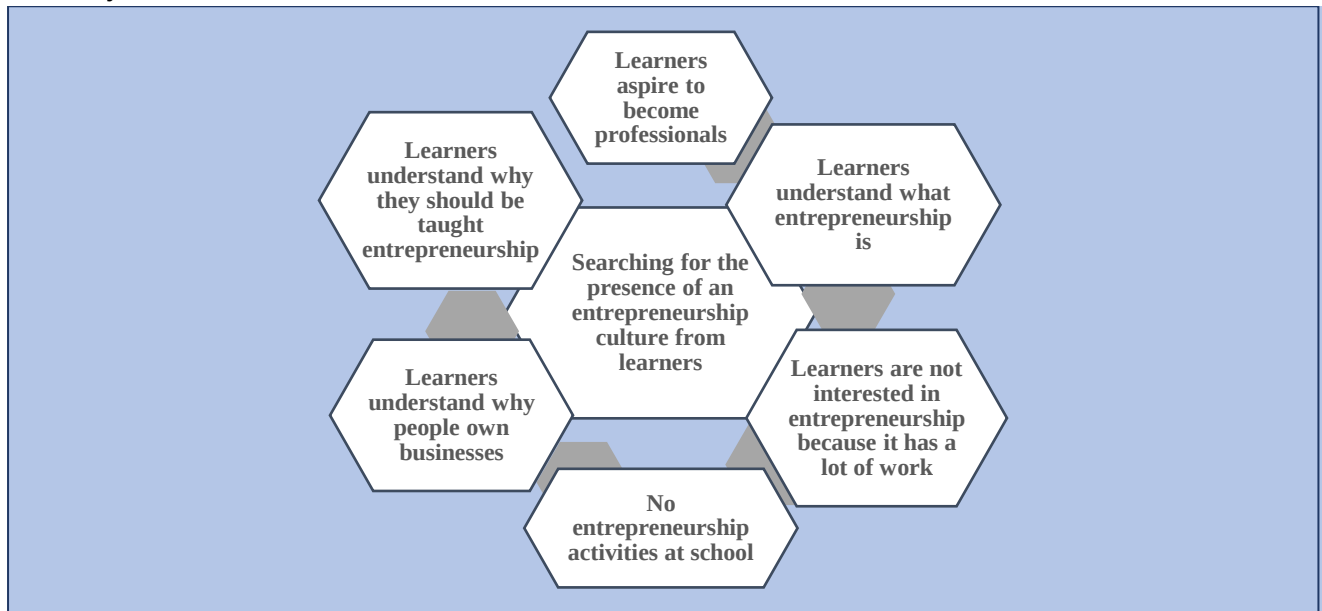


Figure 2. Learner's Perception of Entrepreneurship Culture

Source: Own

Learners' responses to interview questions were less engaging, but a lack of interest in entrepreneurship teaching and learning was evident. Answers were followed by probing, which yielded fewer results. Learners understood the concept of entrepreneurship and why people own businesses but displayed no pleasure in discussing the topic further. It became apparent that learners never knew that becoming an entrepreneur was a possible career option.

When asked about the possibility of owning businesses in the future, the learners' reactions indicated their lack of interest in entrepreneurship. Irrespective of understanding entrepreneurship, learners displayed unhappiness about the subject and complained that entrepreneurship has burdensome work. Learners' experiences with the teaching and learning of entrepreneurship were generally negative. The assumption is that the subject will not be valued if educators' entrepreneurship teaching does not appeal to learners. The entrepreneurship fair is not viewed as a practical event, as learners regard it as an occasion to raise money for the school.

Finally, learners acknowledged that there were few or no entrepreneurship activities at their respective schools, except the fair where learners sold sweets and cakes. The fair did not expose learners to entrepreneurship possibilities or capture their interest. The findings answer the research question of whether learners were interested in learning entrepreneurship, to which the answer was a 'no'.

4.2.3 Perspectives from Educators

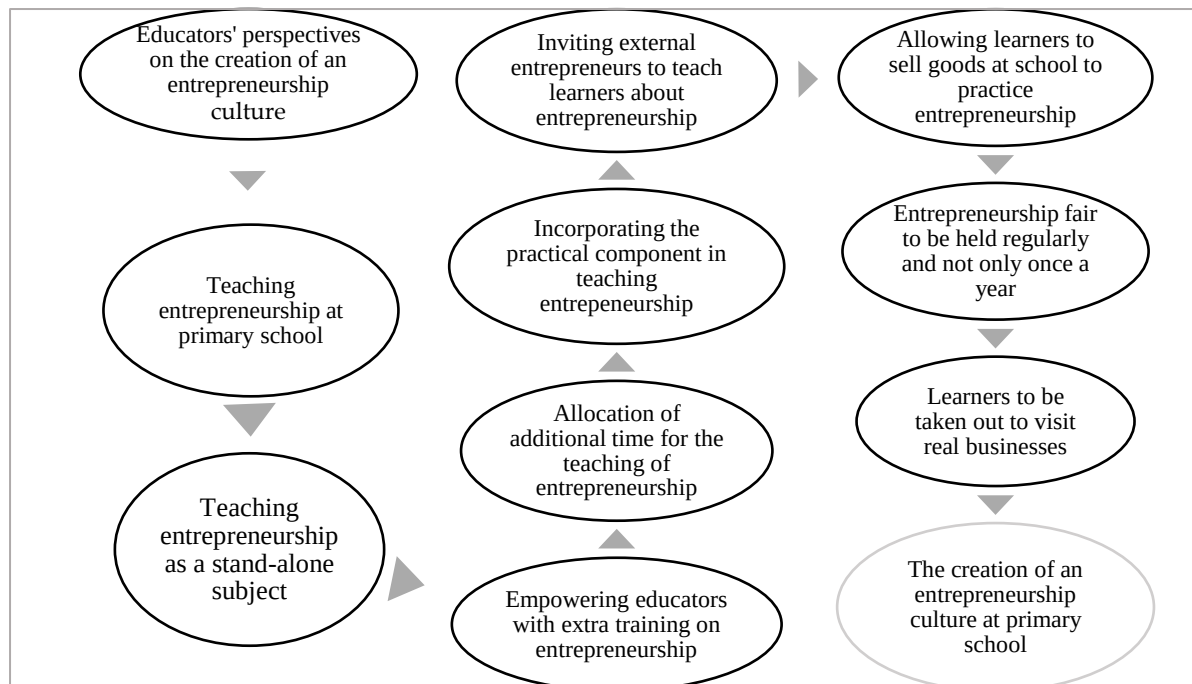


Figure 3. Responses from Educators and the Link to Learners' Responses

Source: Own

Seikkula-Leino and Deveci (2018) suggest that practical teaching should accompany entrepreneurship. This suggestion was validated by educators who affirmed that practical activities barely existed for learners and that this lack posed an obstacle to creating an entrepreneurship culture at the primary schools in the study. The practical teaching of entrepreneurship has been a point of contention since the restructuring of the primary school curriculum in 2005. Accordingly, the practical part of entrepreneurship has never been correctly integrated into the teaching of the subject, even though it has been touted as essential, even though clarity is not provided (Du Toit & Gaotlhobogwe, 2018).

The discussions with educators were intense and nearly degenerated into venting sessions at times, prompting the researcher to pull the discussion back to the research questions. Regardless, the data from the educators was invaluable in presenting challenges and obstacles to creating an entrepreneurship culture. Participants, in this case, educators, provide solutions to the problem presented by the study, and the responses assist in answering the research question on the role of primary school education in creating entrepreneurship culture and generating knowledge on this aspect.

Educators believe that teaching entrepreneurship should be linked to real businesses in the community for learner mentoring, motivating, and guiding. This should create an entrepreneurship culture to display entrepreneurship possibilities to learners. The ideas presented by educators are focused on benefitting learners in learning entrepreneurship better and igniting interest in the subject. Effective entrepreneurship teaching can only be attained if educators are empowered to be experts in teaching the subject and promote it to stimulate the creation of an entrepreneurship culture. Ultimately, creating an entrepreneurship culture and inspiring learners to be entrepreneurs would reduce youth unemployment.

4.2.4 Perspectives from school principals

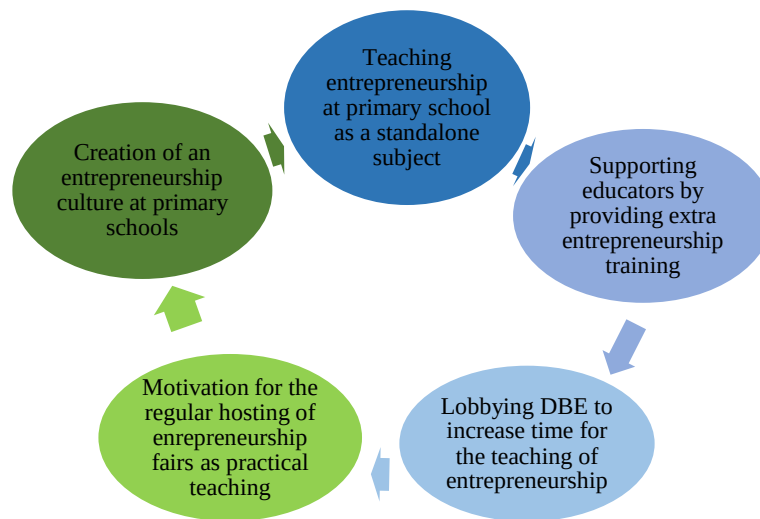


Figure 4. Key Concepts in Creating an Entrepreneurship Culture

Source: Own

Figure 4 presents principals' perspectives on creating an entrepreneurship culture in primary schools, echoes the educators' sentiments, and summarises key aspects that could be considered in making an entrepreneurship culture. The school principals support educators and emphasise that learners are attracted to an exciting and well-presented learning programme. There is also an acknowledgement that entrepreneurship should be well-presented to learners. Currently, the presentation of entrepreneurship content is not intriguing to learners, and educators are not adequately trained to teach entrepreneurship, thus causing them to lack confidence in presenting entrepreneurship content. The principals reiterate the emphasis on establishing if educators are suitably qualified to teach entrepreneurship at primary school, alluding to the fact that inadequate training of educators is why learners are not interested in entrepreneurship, hence playing no role in creating entrepreneurship culture.

The principals also addressed the objective of investigating if learners are interested in learning about entrepreneurship by providing why learners are not interested in entrepreneurship - due to educators' inadequate training and not being assertive in presenting entrepreneurship content. The findings from principals present a picture of the role that primary schools could play in creating an entrepreneurship culture. The principals ponder engaging the DBE to consider teaching entrepreneurship effectively as a stand-alone subject. The principals display support for educators and appear to be hamstrung by DBE's inflexible CAPS. They shared educators' frustration with the ineffective teaching of entrepreneurship. The principals concede that primary schools do not create an entrepreneurship culture, thus not reducing youth unemployment.

However, the researcher observed the principals' determination to engage DBE to address the teaching of entrepreneurship. The intention was to present to DBE that entrepreneurship should be structured as a stand-alone subject, allocated extra time, and given the necessary attention.

4.2.5 Perspectives from members of school governing bodies (SGBs)

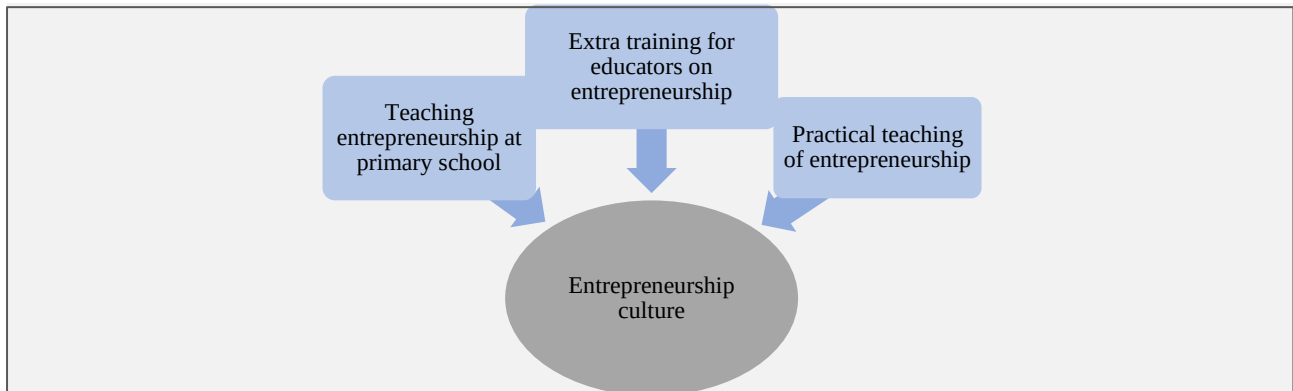


Figure 5. SGB members' view regarding the creation of entrepreneurship culture

Source: Own

As contributors of extra information to the study, the information shared by the SGB members is in contrast to that of the principals and educators. SGB members believe that the time allocated for teaching entrepreneurship was adequate and that the subject should remain part of EMS. From the information shared by SGB members, the researcher identified possible obstacles to creating an entrepreneurship culture. The three points in Figure 5 align with the responses from the other participants when considering building an entrepreneurship culture. The consensus was that entrepreneurship should be taught at primary school, and educators require appropriate training. In addition, the practical teaching of the subject was regarded as vital for learners.

The differing responses from SGB members serve as a reminder that data synthesis requires a more profound exploration to attain new information. Another research study must prove that SGB members had valid reasons to voice these contrasting views of entrepreneurship remaining part of EMS and diverse opinions on the frequency of hosting entrepreneurship fairs. If not adequately addressed, these views will hinder the creation of an entrepreneurship culture in primary schools.

4.2.6 Perspectives from the Department of Basic Education (DBE) official

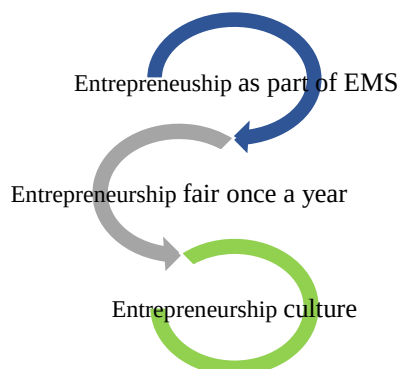


Figure 6. DBE official's response

Source: Own

Further clarification of the data was obtained from an official in the curriculum development section of the DBE. The participant focused on two issues that differed from educators and principals but agreed with SGB members that entrepreneurship should remain a component of EMS and that the entrepreneurship fair should be held once a year. Figure 6 presents the view of the official from the DBE on maintaining entrepreneurship's incorporation in EMS; indicating that it had been thoroughly researched and found to be appropriate. The official

defended hosting an entrepreneurship fair once a year, saying that learners could learn to trade from entrepreneurship fairs held for one day a year. The statement addressed objective d) to evaluate entrepreneurship activities in primary schools. It became evident that the entrepreneurship fair was supposedly the practical part of teaching the subject. This acknowledged that entrepreneurship as a subject required practical teaching and learning. When asked why entrepreneurship was an optional subject, the official said many factors were considered when the decision was taken but declined to elaborate, posing an obstacle to creating an entrepreneurship culture.

5. Discussion

The participants' experiences are unpacked and examined to uncover the truth about the research question, a process called interpretation (Babbie, 2018). Willig (2017) expounded that human behaviour is attached to meaning and that meaning must be uncovered through interpretation. The discussion in this study centres around views obtained about learners, educators, principals and SGB members. Finally, the opinions of DBE officials are discussed to identify possible links between the data from the other participants.

5.1. Learners

There is no difference between learners at no-fee schools in township/rural and farm areas and those in urban and suburban areas regarding how they responded to interview questions. However, learners could not link entrepreneurship taught in class with the entrepreneurship fair, for example, 'What do you learn during the entrepreneurship fair?' To which all learners' responses were 'To sell sweets and cake for the school.' This discrepancy poses an obstacle to creating an entrepreneurship culture since the fair is hosted for only a day in a year; therefore, it will not be feasible for learners to grasp the concept of entrepreneurship in its totality-transferring theory to practice. Furthermore, learners cannot connect what they learn about entrepreneurship in class with businesses outside the school, which is further evidence that there is a disconnection between theory and practice. There is no in-depth learning about entrepreneurship as a practical subject. Therefore, excluding the practical part in teaching entrepreneurship at primary schools would not assist in creating an entrepreneurship culture that attracts learners into the field of entrepreneurship, and ultimately, less contribution to the reduction of youth unemployment. Additionally, for teaching entrepreneurship to be effective, the curriculum must provide a clear direction of how the subject should be taught in schools. Currently, DBE policy on the teaching of entrepreneurship is ambiguous and unattractive to learners and needs restructuring.

Generally, learners lacked eagerness in the discussion of entrepreneurship, and their aspirations most lean towards obtaining a qualification and looking for employment in line with DBE objectives of preparing learners for the world of work and providing employers with skilled employees. Although encouraging learners to consider entrepreneurship as a career option did not imply that all learners would become entrepreneurs, providing a different career consideration would assist them in making informed choices with the belief that creating an entrepreneurship culture in schools will inspire learners to consider entrepreneurship as a career. However, it is difficult to discern if the lack of interest in entrepreneurship was due to excessive work or the limited time allocated to the subject. It is further evident that there is a general dislike for the subject due to unskilled educators' evaluating the subject of entrepreneurship or a lack of intentional, practical teaching. Therefore, the lack of interest in entrepreneurship signals the schools' absence of an entrepreneurship culture.

5.2. Economic and management science (EMS) educators

All EMS educators concede there is an inadequate entrepreneurship culture in schools. As a result, educators touted the suggestion of inviting external entrepreneurs to the schools to share business knowledge and provide learners with much-needed practical learning. This idea would create an entrepreneurship culture at schools and encourage learners to consider entrepreneurship as a career of choice. DBE needs curriculum restructuring to elevate the status of entrepreneurship education as the backbone of the country's economy. The devaluing of the subject of entrepreneurship does not motivate learners to consider being entrepreneurs and contributes to the reduction of youth unemployment. This is an obstacle to creating an entrepreneurship culture. In this regard, school education does not create an entrepreneurship culture, and educators are willing to change the situation.

5.3. School Principals

Principals are bound to follow the DBE guidelines and are not at liberty to introduce alternative methods of teaching entrepreneurship. This lack of flexibility hinders the creation of an entrepreneurship culture at the school. The general perception from principals is that better ways of disseminating entrepreneurship education in schools are possible if only the DBE would grant permission for educators to apply creative methods of imparting entrepreneurship information. However, principals are discouraged because they must follow the strictly structured school curriculum with little room to manoeuvre. Another concern is that learners are not inspired to become entrepreneurs; parents pressure them to study for professions such as doctors, engineers, accountants, and pilots, which would remunerate them well.

5.4. SGB members

The SGB members contradict what the educators and principals said, mostly agreeing only on teaching entrepreneurship in primary schools and the training of educators. SGB members lack classroom teaching experience, which contradicts principals' and educators' experience in teaching.

5.5 DBE official

The DBE official endorsed some views shared by SGB members, such as entrepreneurship remaining part of EMS, the entrepreneurship fair being held once a year and adequate time for teaching entrepreneurship. The official acknowledges the department's knowledge of the need for entrepreneurship in practical teaching and learning. This awareness informed the decision by the GDE to start building entrepreneurship schools, with the first already completed in Soweto. However, it seems removed from schools' challenges in teaching entrepreneurship.

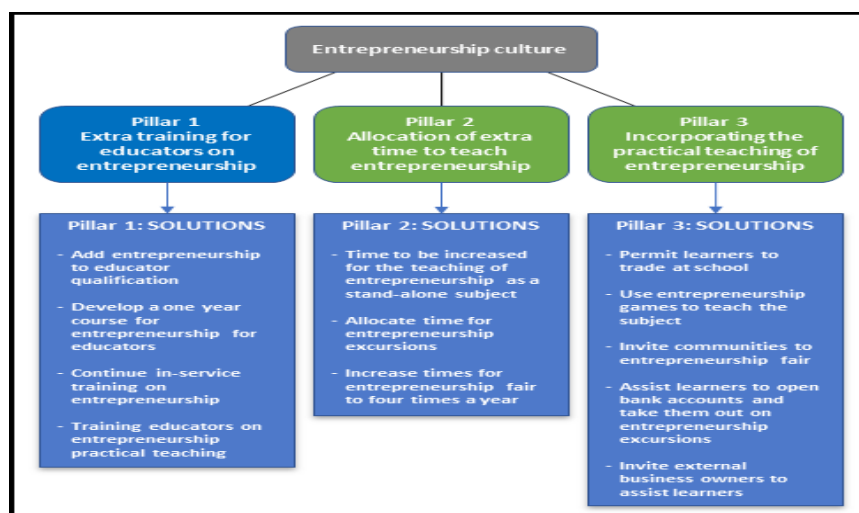


Figure 7. Main contribution of the study: three cardinal pillars

Source: Own

Figure 7 portrays the main contribution of this study, which is the three cardinal pillars for enhancing entrepreneurship culture in schools. These pillars address the main obstacles raised throughout the study: inadequate training of educators, lack of practical teaching and learning, and less time allocation for entrepreneurship education. Poorly trained educators would not be able to convey entrepreneurship information to learners, learners would not be able to internalise the concepts of entrepreneurship without practical learning and more time allocation is required for entrepreneurship to be taught as a component of EMS and/or as a stand-alone subject, preferably as a stand-alone subject. The suggested solutions aim to aid all stakeholders in the basic education sector in determining appropriate measures to be taken to enhance entrepreneurship culture in schools and amongst learners at their early ages of education.

Conclusions

This study sought to investigate the role of primary school education in creating an entrepreneurship culture to inspire primary school learners to become entrepreneurs as an alternative intervention to youth unemployment. In doing so, the questions asked were threefold:

1. Are educators well-trained to teach entrepreneurship at primary schools and able to inspire learners to become entrepreneurs?
2. Is there adequate time allocation for educators to teach and create an entrepreneurship culture in primary schools?
3. Are the learners interested and inspired in learning about entrepreneurship, creating a culture of entrepreneurship and becoming entrepreneurs?

The findings indicate that the training of educators, practical teaching and learning, and more time allocation for teaching entrepreneurship are the focal points needed to create an entrepreneurship culture at the primary schools in SA. In other words, learners will benefit from trained educators, while more time allocation is required for entrepreneurship to be taught as a component of EMS or as a stand-alone subject. The findings present the foundation for a more comprehensive study to be conducted with the findings to assist other primary schools in SA. The literature review and the interviews conducted in this study point to the lack of three cardinal pillars (as the main obstacles) while creating an entrepreneurship culture.

The ineffectiveness of entrepreneurship education in primary schools can be attributed to the devaluation of the subject cloistered in EMS and allocated very little time and the insecurity of educators about entrepreneurship content. In addition, the inauspicious nature of entrepreneurship means that learners are not interested in the subject, an entrepreneurship culture cannot be established, and therefore, youth unemployment cannot be alleviated. The three cardinal pillars and solutions present the ideal process for creating an entrepreneurship culture of teaching entrepreneurship at primary schools, training educators in entrepreneurship, ensuring that entrepreneurship becomes a stand-alone subject that is allocated more time, incorporating practical components to the teaching of the subject, provide resources for teaching entrepreneurship and ultimately create entrepreneurship culture and expose learners to entrepreneurship opportunities.

Recommendations

This study reveals a notable disconnection in entrepreneurship teaching between theory and practice that should be given attention when restructuring the curriculum. The current teaching methods of textbooks, chalk and board appeared ineffective and disregarded by learners. Consequently, learners are still expected to look for employment after leaving school, thus perpetuating youth unemployment. Teaching entrepreneurship in primary schools should allow learners to start enterprises whilst still in school (White, 2017). For primary schools to contribute to reducing youth unemployment, the DBE should initiate the process by training educators on entrepreneurship before considering entrepreneurship as a stand-alone subject to create a culture that would motivate learners to aspire to become entrepreneurs. Creating an entrepreneurship culture in primary schools to make entrepreneurship an alternative career to job-seeking that appeals to learners can only be realised when teachers are confident in teaching the subject. Therefore, the inculcation of cognisance for entrepreneurship education should be preceded and propelled by a desire to create an entrepreneurship culture in primary schools.

Table 4. Recommended activities

Creating entrepreneurship culture	Recommended activities
Role to be played by primary schools to create an entrepreneurship culture	• Extra teacher training on entrepreneurship • Increased teaching and learning time for entrepreneurship. • Invitation to business owners to visit primary schools to teach learners the practical elements of entrepreneurship. • Permitting learners to sell goods at school under supervision. • Playing entrepreneurship games with learners in class during lessons • Regular entrepreneurship fairs for practical learning (at least quarterly – four times a year) • Teach entrepreneurship as a stand-alone subject

Source: Own

Limitations of the study and further research

Qualitative research requires a small sample (27 participants in this study) and covers only the selected schools in the City of Tshwane Metropolitan Municipality in Gauteng Province. Although non-probability sampling was necessary, the sampling method was subjective in selecting suitable participants for the study as the researcher decided the type of participants that would benefit the study. Of all primary school learners, only grade 7 participated in the study as they were the only grades taught entrepreneurship. The educators, principals and SGB members were additional participants. Phenomenological qualitative research is subjective and prone to biases because it focuses on participants' personal experiences. In this study, the researcher tried to avoid biases by allowing participants to respond without interference and reflect on their responses.

This study was conducted in the City of Tshwane Metropolitan Municipality in Gauteng Province and included only five out of 1368 primary schools and 27 participants; hence, it was a small study. However, the information yielded by the research and the knowledge created should serve as a reference for an extensive analysis that would produce findings generalised to all primary schools in the country. Phenomenological qualitative research allows participants to express themselves and narrate their experiences. The DBE can interrogate these experiences and plan a more extensive study. The findings from the five primary schools indicate that teaching entrepreneurship has little impact on learners and prevents primary school education from playing a role in creating an entrepreneurship culture. The DBE could conduct a more comprehensive study to cover a wider area so that the findings could be generalised to all schools nationwide to inform the restructuring of the primary school curriculum. The recommendations serve as the starting point for further research.

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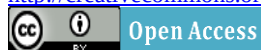
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**E-GOVERNANCE IN SOUTH AFRICA: BARRIERS AND ENABLERS OF VIRTUAL EVALUATION IN THE PUBLIC SECTOR****Lesedi Senamele Matlala***School of Public Management, Governance and Public Policy, University of Johannesburg, South Africa**E-mail: lmatlala@uj.ac.za**Received 15 March 2025; accepted 12 May 2025; published 30 June 2025*

Abstract. Virtual Evaluation (VE) has emerged as a valuable tool in public sector monitoring and evaluation (M&E), offering opportunities to enhance efficiency, accessibility, and cost-effectiveness. The increasing emphasis on digital transformation in South Africa has led to growing interest in integrating VE into public sector evaluation processes. Despite this interest, there is limited empirical research on the factors that influence its adoption, particularly in government institutions responsible for M&E. Existing studies primarily focus on the benefits of VE, with little attention given to the challenges public officials face in implementing it effectively. This study aims to investigate the barriers and enablers affecting the adoption of VE in South Africa's public sector. Using a mixed-methods approach, the study draws insights from workshops hosted by the South African Monitoring and Evaluation Association (SAMEA), a survey with public sector officials, and key informant interviews with senior government evaluators. The Technology Acceptance Model (TAM) and Institutional Theory guide the research, which helps explain the technological and organizational dynamics influencing VE adoption. Preliminary analysis suggests that successful VE implementation depends on technological readiness, institutional support, and regulatory alignment. The study explores challenges related to digital skills, infrastructure, policy clarity, and stakeholder engagement, highlighting areas that require targeted interventions. Based on the findings, the study recommends capacity-building programs to improve digital proficiency among public officials, investment in infrastructure to support VE platforms, and policy frameworks to standardize and institutionalize VE across government departments. By addressing these challenges, public institutions can enhance the effectiveness of M&E practices and leverage digital innovations for improved governance. This study contributes to the evolving discourse on digital transformation in M&E, offering practical insights for policymakers, evaluators, and researchers working to advance evidence-based decision-making in South Africa's public sector.

Keywords: Virtual Evaluation; Public Sector Evaluation; Digital Transformation; Monitoring and Evaluation (M&E); South Africa; Technology Acceptance Model; Institutional Theory; Evaluation Capacity-Building; Policy Innovation; E-Governance.

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JEL Classifications: R11

1. Introduction

Monitoring and Evaluation (M&E) continue to serve as essential tools in the public sector, offering a foundation for accountability, transparency, and evidence-based policymaking. With the increasing complexity of service delivery and heightened demands for efficiency, digital innovations—particularly Virtual Evaluation (VE)—have emerged as promising alternatives to traditional, face-to-face approaches (Funnell & Rogers, 2011; Bamberger & Mabry, 2020; Dossou et al., 2023). VE leverages digital platforms such as cloud-based dashboards, mobile data collection, and real-time analytics to streamline evaluation processes and broaden participation. These capabilities are especially relevant in contexts like South Africa, where logistical and resource constraints often limit large-scale evaluation exercises. By overcoming geographic barriers and reducing costs, VE offers a potentially transformative shift for public sector M&E (UNICEF, 2023).

The integration of VE across Africa has gained momentum in the wake of broader e-governance reforms and the impact of the COVID-19 pandemic (Wirajing & Nchofoung, 2023). Digital tools are increasingly being deployed to collect and process data in sectors such as education, health, and agriculture, albeit unevenly (Letouzé, 2013; United Nations Global Pulse, 2016). In South Africa, however, progress has been patchy (Olumekor et al., 2025). While departments such as Health and Basic Education have experimented with digital platforms, the lack of comprehensive policy frameworks and coordinated infrastructure investments has hindered widespread adoption (OECD, 2022). Global experiences emphasize that the successful institutionalization of VE requires more than just technology—it depends on political will, cross-sector collaboration, and targeted capacity-building (UNDP, 2023). These preconditions are often weak or inconsistently applied within the South African public service, where digital literacy gaps and fragmented IT systems persist (Paul & Adams, 2024).

Despite the increasing use of digital tools in public administration, the adoption of VE in South Africa remains underdeveloped. Studies show that while some public institutions have adapted to virtual M&E environments, many still revert to conventional methods due to a combination of bureaucratic inertia, regulatory ambiguity, and technological under-preparedness (Raftree, 2013; Waxa & Gwaka, 2021). While the Technology Acceptance Model (TAM) explains part of this phenomenon—citing perceived usefulness and ease of use as key factors (Moodley, 2024)—Institutional Theory helps illuminate the broader organizational and systemic forces that discourage innovation in the public sector (Gregory & Wilson, 2018). These include rigid administrative norms, limited interdepartmental coordination, and political resistance to transparency-enhancing tools like VE (African Evaluation Association, 2022). Together, these factors create a constrained environment that limits the uptake of digital evaluation methodologies.

This study critically assesses the key enablers and barriers to VE implementation within South Africa's public sector, drawing from empirical data collected through national surveys, interviews with M&E practitioners, and secondary sources. As global literature suggests, digital transformation in public governance is not solely a matter of technological readiness—it also hinges on institutional culture, regulatory frameworks, and policy coherence (World Bank, 2023). The South African case highlights the disconnect between digital innovation rhetoric and on-the-ground capacity realities, with VE often introduced without sufficient training, funding, or systems integration. By applying both TAM and Institutional Theory, this research explores the micro-level perceptions of evaluators and macro-level dynamics shaping VE adoption. The findings aim to inform strategic interventions that can help reposition VE from a peripheral innovation to a standard practice within public sector M&E frameworks.

The remainder of the paper is as follows. The next sections review existing literature on Virtual Evaluation, focusing on global trends, theoretical frameworks, and empirical studies relevant to the South African context. This is followed by an outline of the research design and methodology, detailing data collection strategies and analytical approaches. The subsequent section presents the findings from the survey, interviews, and SAMEA workshops, identifying key barriers and opportunities for VE adoption. The following discussion explores the implications of the findings, linking them to existing literature and theoretical perspectives. The final section provides policy recommendations and conclusions, highlighting the need for institutional reforms, technological investments, and targeted capacity-building initiatives to facilitate the successful integration of VE into the public sector.

2. Conceptual Framework

Virtual Evaluation (VE) refers to using digital technologies and virtual methodologies to conduct M&E processes remotely, reducing reliance on traditional, in-person data collection and analysis. VE encompasses a range of digital tools, including mobile surveys, cloud-based data management systems, real-time analytics, and video conferencing platforms, all designed to enhance the efficiency, accessibility, and scalability of evaluation

practices (Bamberger & Mabry, 2020). Unlike conventional evaluation methods that require physical presence and extensive logistical arrangements, VE leverages technology to facilitate data collection, stakeholder engagement, and evidence-based decision-making across different geographical locations (Funnell & Rogers, 2011). This approach has gained relevance in contexts where in-person evaluations are constrained by cost, time, or mobility restrictions, making it particularly beneficial for large-scale and cross-sectoral evaluations.

VE operates at the intersection of digital transformation and evaluation science, drawing on innovations in data collection, storage, and analysis to improve the quality and efficiency of assessments. The methodological flexibility of VE allows for integrating quantitative and qualitative evaluation techniques, enabling evaluators to conduct structured surveys, real-time interviews, and participatory assessments remotely. Furthermore, VE is closely linked to broader trends in e-governance and digital public administration, where governments and organizations increasingly adopt technology-driven solutions to enhance accountability and decision-making (United Nations Global Pulse, 2016). While the definition of VE continues to evolve with advancements in digital technology, at its core, it represents a paradigm shift in evaluation methodology, emphasizing efficiency, inclusivity, and adaptability in response to the changing demands of public sector evaluation.

3. Analytical Framework

The analytical framework guiding this study is rooted in two complementary theories: TAM and Institutional Theory. These frameworks help explain the individual-level adoption of VE technologies and the broader organizational and systemic factors influencing their implementation in the public sector. TAM, developed by Davis, posits that the adoption of new technologies is driven by two key factors: perceived usefulness (PU) and perceived ease of use (PEOU) (Kowalska-Pyzalska, 2024).

In the context of VE, PU refers to how effective public officials perceive virtual methodologies to be in enhancing evaluation processes. At the same time, PEOU reflects how they find VE platforms easy to use and integrate into their existing workflows. Several studies have found that public officials are more likely to embrace VE if they believe it improves evaluation efficiency and decision-making without requiring excessive effort or technical expertise (Anadon et al., 2016; McKinsey Digital, 2017). However, TAM alone does not fully account for the organizational, regulatory, and infrastructural barriers that influence VE adoption, necessitating an additional institutional perspective.

Institutional Theory provides a broader organizational lens to understand why public sector institutions either facilitate or resist adopting VE technologies. This theory posits that organizational behaviour is shaped by formal structures (laws, policies, and regulations) and informal pressures (norms, culture, and political dynamics) (Cheng et al., 2017; Gregory & Wilson, 2018). Many public institutions are characterized by rigid bureaucratic structures and risk-averse cultures, which can slow the adoption of digital innovations such as VE. Institutional Theory highlights the role of regulatory frameworks, leadership support, and interdepartmental coordination in determining whether VE is institutionalized as a standard evaluation practice or remains a peripheral tool used only in specific contexts (Gupta, Dasgupta & Gupta, 2008; United Nations Global Pulse, 2016). In this regard, government commitment to ICT infrastructure investment, digital literacy programs, and clear VE policies is crucial in enabling sustainable adoption.

By integrating TAM and Institutional Theory, this analytical framework allows for a multi-level examination of VE adoption in South Africa's public sector. It enables an assessment of public officials' perceptions (micro-level analysis) and the broader institutional environment shaping VE implementation (macro-level analysis). This dual approach is essential given that technological adoption in government is not solely an individual decision but is embedded within complex institutional structures (Shapiro, 2016). The analytical framework will guide the study in exploring how digital evaluation tools are perceived, how public institutions shape adoption decisions, and

what systemic changes are required to support VE integration into South Africa's public sector evaluation ecosystem.

4. Literature Review

The integration of ICT into public administration has revolutionized how governments deliver services, engage with citizens, and evaluate policy performance. VE—a digitally enabled method of conducting M&E remotely—has gained traction for its ability to facilitate real-time data collection, reduce costs, and improve accessibility (Bonfiglio et al., 2023; UNICEF, 2023). As governments shift toward digital governance frameworks, VE stands out as a mechanism that can address logistical challenges and support more inclusive evaluation practices (Garcia & Kotturi, 2020; Fröhlich et al., 2024). Yet, despite its potential, VE remains underutilized in many public sectors, particularly in the Global South. This underutilization stems from challenges such as data security, ethical concerns, digital exclusion, and weak regulatory frameworks (Facca et al., 2020; Petersson & Breul, 2020).

Countries such as Canada, South Korea, and Brazil have advanced digital M&E by leveraging tools like artificial intelligence, blockchain, and big data analytics to enhance real-time performance assessments and ensure transparency in public governance (Jasper et al., 2023). For example, Canada's blockchain-backed evaluation systems enable secure, tamper-proof data management, while South Korea uses AI-based platforms to assess health and urban planning policies (Leeuw, 2020; Gregory & Wilson, 2018). Brazil and Mexico have also made strides with open-data and geospatial monitoring systems in Latin America in social and environmental programs, respectively (Cintron & Montrosse-Moorhead, 2022). These examples demonstrate that VE is scalable and adaptable to various governance settings, providing institutional buy-in and technological readiness (Reid, 2023).

In contrast, VE implementation across much of sub-Saharan Africa remains fragmented due to infrastructure gaps, digital illiteracy, and limited policy support (Hejnowicz & Chaplowe, 2021). While mobile-based evaluations have been piloted in countries like Kenya and Ghana, the lack of sustainable investment in VE systems limits their scalability (Mobenzi, 2020). Despite national digital strategies and growing interest in e-governance in South Africa, VE uptake has been sporadic and mainly driven by donor-funded pilot initiatives. Institutional inertia, rigid procurement systems, and outdated regulatory frameworks hinder full-scale adoption. Moreover, many departments operate with legacy systems incompatible with cloud-based tools, posing a technical and financial barrier to digitizing evaluation practices.

Emerging research suggests that one of the critical enablers of VE adoption is the ability to align digital tools with existing policy mandates and operational needs. Studies by Bamberger and Mabry (2020) and Davies et al. (2018) emphasize the importance of developing flexible evaluation frameworks integrating ethical data management, participatory design, and adaptive learning. In VE, real-time analytics and AI-enhanced platforms can offer deeper insights into program effectiveness. Still, their implementation must be guided by strong legal and ethical standards—particularly concerning data privacy, equity, and consent (Facca et al., 2020). This is particularly relevant when working with marginalized populations or politically sensitive contexts where digital exclusion and trust deficits may compromise data integrity.

The evolving landscape of digital evaluation calls for a paradigm shift in how public institutions conceptualize and execute M&E. As the COVID-19 pandemic illustrated, digital platforms are not just alternatives but necessary instruments for continuity in evaluation under conditions of uncertainty (UNICEF, 2023). However, transitioning to VE demands more than adopting new technologies—it requires institutional transformation, sustained capacity-building, and a rethinking of accountability mechanisms in the digital era (Garcia & Kotturi, 2020; McKinsey Digital, 2017). While international models provide valuable lessons, localized approaches tailored to governance contexts like South Africa are essential for meaningful VE implementation. Bridging the

gap between potential and practice in VE requires multisectoral collaboration, adequate funding, and a commitment to continuous learning and policy coherence.

5. Context and Scope of Virtual Evaluation in the Public Sector

In this study, the assessed VE refer specifically to government-led evaluations of public programmes and policies across various sectors, including health, education, social development, economic development, and environmental governance. These evaluations were conducted virtually using online surveys, remote interviews, digital data dashboards, and video conferencing platforms like MS Teams and Zoom. Government officials reported using VE primarily to monitor program performance, assess service delivery outcomes, evaluate policy implementation progress, and conduct stakeholder consultations. For instance, in the education sector, VE was used to assess school readiness interventions and teacher development programmes, while in health, it was applied to assess the rollout of community-based care strategies. These examples demonstrate that VE is not limited to administrative functions but is increasingly used to monitor complex, field-based interventions and policy reforms. Logistical constraints, cost-efficiency considerations, and a broader push for digital transformation in public service delivery largely drove the shift to virtual modes.

6. Methodological Framework

6.1 Research Design and Rationale

This study adopts a qualitative-dominant mixed-methods design to investigate the barriers and enablers influencing the adoption of VE in South Africa's public sector. This methodological approach was selected to capture both individual experiences and systemic challenges shaping VE implementation across varying levels of government. Mixed-methods research is particularly suited for studying digital innovation within public administration, where adoption decisions are informed by personal perceptions, organizational cultures, and regulatory dynamics (Fetterman et al, 2015; Creswell, 2017). The design integrates three core components: a structured online survey, one-on-one semi-structured interviews, and analysis of workshop discussions with M&E professionals. These instruments allow for triangulated insights into how VE is understood, utilized, and contested within public institutions.

6.2 Data Collection Methods

Primary data was collected between July and October 2024. Ethical clearance for the study was obtained from the University of Johannesburg's Faculty of Humanities Research Ethics Committee (Protocol No: 24PMGPP157). All data collection activities were conducted virtually using digital platforms such as Google Forms for surveys and Microsoft Teams or Zoom for interviews and workshops. The survey served a dual purpose: it captured quantitative perceptions of VE from M&E professionals and functioned as a recruitment tool for the qualitative phase. Out of the full dataset, responses from 98 public-sector officials were isolated for this study to ensure sector-specific relevance. These respondents were drawn from national, provincial, and municipal departments.

Four semi-structured interviews were conducted with eight government officials representing different tiers and departments within the public sector. These interviews enabled a deep dive into leadership perspectives on VE policy alignment, budgetary priorities, institutional resistance, and digital readiness. In addition, transcripts from three multi-stakeholder virtual workshops were analyzed, focusing specifically on contributions from public officials. Although the workshops were attended by representatives from academia, NGOs, and the private sector, the current analysis maintains a narrow lens on government insights to preserve thematic consistency. Both the interviews and workshops offered rich, dialogic spaces for capturing the lived experience and strategic reflections of officials tasked with implementing or overseeing VE initiatives.

6.3 Data Analysis Techniques

Qualitative data from interviews and workshops were thematically analyzed using NVivo 12, applying Braun and Clarke's (2006) six-phase framework. This approach enabled systematic coding and the identification of recurrent themes such as infrastructure limitations, digital literacy gaps, policy fragmentation, and stakeholder resistance. Patterns were cross-validated across sources to enhance analytical rigour. Survey data was processed in SPSS, where descriptive statistics were used to highlight trends in attitudes toward VE's feasibility, perceived effectiveness, and institutional constraints. While inferential statistical methods were not prioritized due to the sample size, the descriptive results complemented and contextualized the qualitative findings.

6.4 Validity, Reliability and Ethical Considerations

Multiple strategies were employed to ensure the credibility and trustworthiness of the study. Data triangulation across three distinct sources (surveys, interviews, and workshops) allowed for cross-verification of emerging insights. Researcher reflexivity was also maintained throughout the process to minimize bias in interpretation. Participation in the study was entirely voluntary, and all respondents provided informed consent before engagement. Confidentiality was upheld through anonymized coding (e.g., GOV012, GOV021) and secure data storage on password-protected devices. No personal identifiers were retained in the analysis or reporting processes, and participants were informed of their right to withdraw at any point without penalty. The University of Johannesburg's ethical approval process ensured that all procedures adhered to standard academic protocols, affirming the study's ethical integrity and compliance.

7. Findings and discussions

7.1 Demographic profiles of the participants

The demographic profile of the 22 government officials who participated in the interviews and 40 respondents from the survey provides key insights into the composition, experience, and expertise of public sector evaluators engaging with VE. Most interview participants were Program/Project Managers (10 respondents) and Professional Evaluators (8 respondents), indicating that most individuals involved in VE discussions occupy operational and managerial roles within government-led evaluations. Researchers (4 respondents) were comparatively fewer, highlighting a limited engagement of research-driven evaluation specialists in policy implementation processes. The survey respondents showed a similar distribution, with 14 Program/Project Managers and 12 Professional Evaluators comprising the largest segments. Experience levels varied, with most senior officials (more than 10 years of experience) occupying managerial positions, which could influence attitudes toward VE adoption given their reliance on traditional evaluation methodologies. Conversely, early-career professionals (1-5 years of experience) were primarily found in Researcher and Public Service Evaluator roles, indicating that younger professionals may be more receptive to technology-driven evaluation processes.

The gender and education composition of participants further reflects key structural patterns within the public sector evaluation space. Female officials (11 interviewees and 19 survey respondents) were likelier to occupy mid-level evaluation roles, while male officials dominated senior leadership positions. Educational backgrounds suggest high expertise among government evaluators, with most participants holding Master's (15) or Honours (12) qualifications. Notably, PhD holders (6 respondents) were concentrated in the education and social development sectors, reinforcing the idea that policy-oriented evaluation roles attract higher academic qualifications. The geographic distribution of participants showed a strong concentration in Gauteng, Western Cape, Free State, and KwaZulu-Natal, highlighting the centralization of government evaluation functions in administrative hubs. These findings suggest that while VE adoption is influenced by institutional positioning, experience, and digital literacy, younger and mid-career professionals may be key drivers of technological transformation in public sector evaluation.

Table 1. Government Officials – Comprehensive Demographic Overview

Category	Interviews (n=22)	Survey (n=40)
Role in Evaluation		
Program/Project Manager	10	14
Professional Evaluator	8	12
Researcher	4	6
Public Service Evaluator	0	4
Traditional Civil Servant	0	4
Years of Experience		
1-5 years	5	8
6-10 years	7	12
More than 10 years	10	20
Gender		
Male	11	21
Female	11	19
Highest Education Level		
PhD/NQF 10	4	6
Masters/NQF 9	9	15
Honours/NQF 8	7	12
Diploma/NQF 6	2	7
Sector of Evaluation		
Education	7	12
Health	6	10
Social Development	5	8
Environment	4	6
Economic Development	3	7
Geographic Distribution		
Gauteng	8	14
Western Cape	5	9
Free State	4	6
KwaZulu-Natal	3	6
Limpopo	2	5

7.2 Understanding and Adoption of Virtual Evaluation

The understanding and adoption of VE within the public sector remain uneven, with significant gaps between theoretical awareness and practical implementation. As illustrated in Figure 1, a large portion of survey respondents demonstrated some level of familiarity with VE, with 44% rating their understanding as *Good* and 32.6% as *Fair*. However, only 16% rated their understanding as *Excellent*, while a small but notable group (9%) reported *Poor* or *Very Poor* comprehension. This discrepancy suggests that while many government officials

acknowledge the principles of VE, fewer have hands-on experience applying these methods in their evaluation processes. This finding is reinforced by data on VE adoption, where only 30% of respondents reported incorporating VE methodologies into their government evaluation projects.

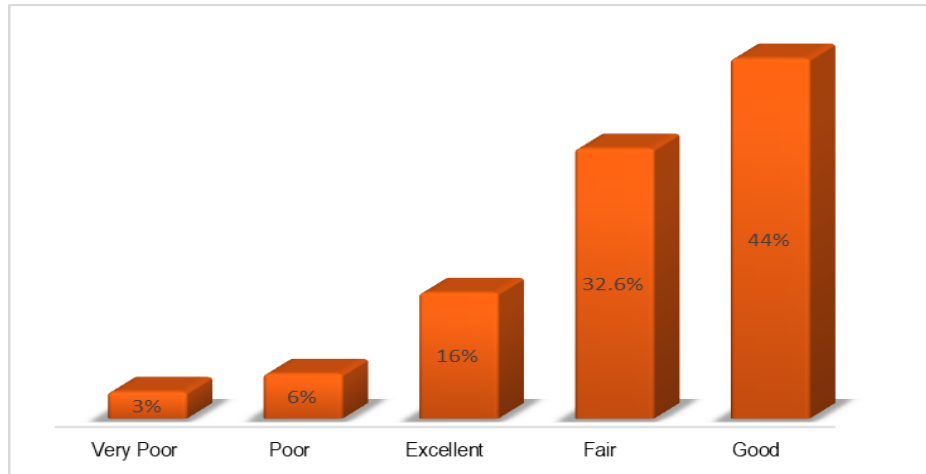


Figure 1. Understanding of Virtual Evaluation

Source: own production

When asked about their previous use of VE, 48% of the respondents indicated that they had integrated VE methodologies into government evaluation projects at least once (see Figure 2). In comparison, 13% of respondents had never fully conducted a VE but had participated in discussions about its potential implementation. Interviews revealed that officials who had conducted VE processes tended to work in the education, health, and social development sectors, where digital monitoring tools are more commonly piloted. However, many participants cited inconsistent internet connectivity, lack of digital literacy, and resistance to technology adoption as key barriers to fully transitioning to VE models.

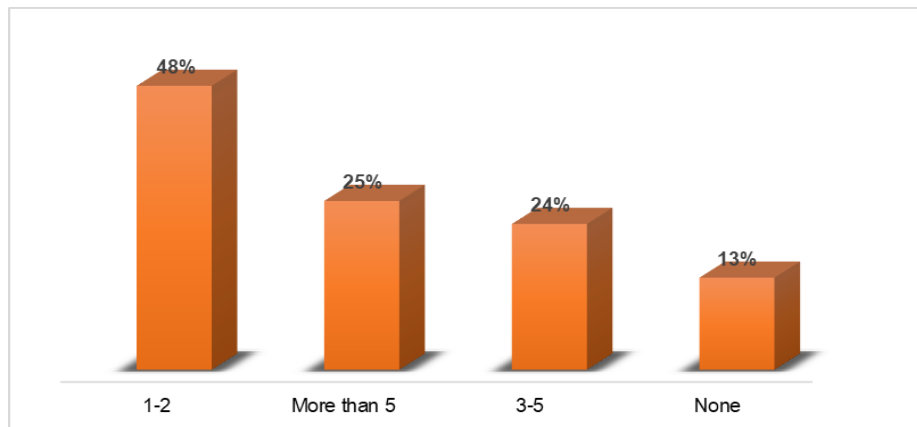


Figure 2. Incorporation of Virtual Evaluation in Projects

Source: own production

Before presenting the detailed findings, it is useful to summarize the main barriers and enablers influencing the adoption of VE in South Africa's public sector. These factors were derived from survey results, interviews, and workshop discussions with public officials. The barriers include institutional resistance to change, technological and infrastructure constraints, limited digital capacity, data security concerns, and cultural resistance to virtual

engagement. Conversely, enablers include increasing recognition of VE's effectiveness, supportive policy frameworks, growing technological investments, and the willingness of some departments to integrate VE into future evaluation initiatives. Table 2 below provides a consolidated overview of these key factors.

Table 2. Overview of Barriers and Enablers to VE Adoption in the Public Sector

Barriers to VE Adoption	Enablers to VE Adoption
Institutional and bureaucratic resistance to change	Perceived effectiveness and feasibility of VE
Technological limitations and infrastructure gaps	Institutional and policy support for VE adoption
Digital literacy and public sector capacity deficits	Technological advancements and infrastructure investments
Methodological and data security concerns	Future intent to use VE in public sector evaluations
Cultural and stakeholder resistance to VE	

7.3 Barriers to the Effective Virtual Evaluation Adoption

Adopting VE in the public sector is hindered by several challenges that impact its effectiveness and implementation. As depicted in Figure 3, most respondents (89.1%) acknowledged experiencing barriers in implementing VE, reinforcing concerns about the feasibility of digitizing evaluation in government settings. Table 3 further breaks down these barriers, with technological limitations such as unstable internet connectivity and compatibility issues emerging as the most prominent challenge, cited by 20 respondents. This is followed by a lack of digital literacy (10), underscoring the reality that many public officials and stakeholders are inadequately trained to utilize VE tools effectively. Concerns about data privacy and regulatory compliance (5) point to risks associated with handling sensitive evaluation data on virtual platforms. Cultural barriers (3), such as discomfort with digital interactions in traditionally interpersonal contexts, further reveal that VE adoption is not only a technical issue but also a socio-cultural one.

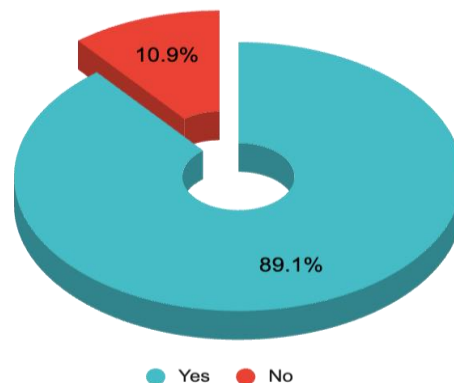


Figure 3. Annual Challenges Experienced in Virtual Evaluation
Source: own production

The qualitative responses reinforced the survey data by exposing less quantifiable yet significant barriers such as the erosion of interpersonal connection in digital spaces, limited participant engagement, and distrust of remote methodologies. For instance, issues like low response rates, bias due to digital exclusion, power cuts, and difficulties in rapport-building during virtual interviews were all cited, each by one or two respondents. These may appear statistically marginal, but when triangulated with qualitative insights, they underscore the cumulative weight of seemingly minor yet persistent operational disruptions. Of note is the lack of stakeholder willingness to engage in VE—reported by at least one participant—which speaks to a broader scepticism about the legitimacy of virtual tools in high-stakes public evaluations. These findings reveal a landscape where technological readiness, institutional culture, and social trust intersect to shape the trajectory of VE implementation. The following

sections delve deeper into technological, institutional, methodological, and cultural barriers to unpack the nuanced and often systemic issues obstructing VE institutionalization in South Africa's public sector.

Table 3. Challenges Faced in Conducting Virtual Evaluations (VE)

Challenge	Count
Technological limitations (e.g., unstable internet connection, compatibility issues with digital platforms)	20
Lack of digital literacy among stakeholders (e.g., difficulty navigating online tools, limited access to technology)	10
Concerns about data privacy and security (e.g., protecting sensitive information shared online, ensuring compliance with data protection regulations)	5
Cultural sensitivities (e.g., challenges in adapting virtual evaluation methods to diverse cultural contexts)	3
Elements of interpersonal connection lost using online methods	2
Elements of interpersonal connection lost using online methods	2
Low response rates from participants	2
Bias in online samples due to digital accessibility differences	1
Inconsistent responses and participant hesitation due to privacy concerns	1
Difficulty in building rapport with focus groups and interviewees	1
Loadshedding and power cuts affecting digital meetings	1
Lack of willingness from stakeholders to engage in VE	1
Limitations in conducting direct observations in VE	1

7.3.1 Institutional and Bureaucratic Resistance to Change

One of the primary barriers to adopting VE in the public sector is institutional inertia and resistance to change, which are deeply rooted in government bureaucracies. Findings indicate that senior officials, particularly those with over ten years of experience, are hesitant to shift from traditional evaluation methodologies, prioritizing direct engagement and structured oversight. The reliance on long-standing bureaucratic procedures makes integrating VE challenging, as officials perceive it disrupts conventional oversight mechanisms. Survey data supports this notion, with 35 out of 40 respondents identifying limited face-to-face interaction as a key disadvantage of VE (Table 3). The preference for in-person evaluations aligns with the structured nature of public sector accountability mechanisms, where interpersonal interactions, contextual observations, and relationship-building are considered vital components of the evaluation process. According to participant GOV012, a senior official from Gauteng, *"Virtual evaluations challenge the traditional way we assess programs. Without direct engagement, verifying the validity of findings and building trust with stakeholders is harder."* This sentiment illustrates a broader concern that digital methods may weaken the rigour of public sector evaluations by reducing direct oversight and engagement with beneficiaries.

Table 4. Perceived Disadvantages of Virtual Evaluation (VE)

Disadvantage	Count (n=40)
Limited face-to-face interaction	35
Technical challenges	32
Concerns about data privacy and security	28
Potential biases in online data collection	30

Beyond institutional resistance, the bureaucratic structure of government evaluations reinforces hierarchical control over data collection and reporting. Traditional evaluations allow for centralized authority over fieldwork, data validation, and decision-making, while VE introduces decentralized participation that some officials perceive as a threat to institutional control. This is evident in the reluctance of senior officials to embrace digital

transformation due to concerns over data security, inconsistencies in virtual engagement, and the inability to physically monitor project sites. As participant GOV027, a department head from the Western Cape, noted, *"Virtual evaluations decentralize authority. Instead of our teams overseeing every aspect of data collection, evaluators work remotely, and we don't always have control over what's being reported."* This resistance is not unfounded, as public sector evaluations involve politically sensitive programs where data manipulation or misrepresentation can have significant policy implications. Studies on public sector digital transformation indicate that government agencies are slower to adopt technology-driven processes due to risk aversion and concerns about accountability mechanisms (Heeks, 2018; Dammak et al., 2023). In this context, VE is perceived as an approach that shifts power away from central agencies, reducing their ability to oversee and validate findings in real time.

Another major institutional barrier to VE adoption is scepticism surrounding the credibility and reliability of digital data collection methods. Traditional evaluations in the public sector emphasize on-the-ground observations, direct beneficiary interactions, and comprehensive site visits, all of which VE methods struggle to replicate. Survey findings reveal that 30 out of 40 respondents cited potential biases in online data collection as a critical disadvantage of VE, further reinforcing concerns about data integrity. The perception that digital methodologies may exclude marginalized communities, particularly those with limited digital access, raises concerns about selection bias and the representativeness of evaluation findings. As Participant GOV019, an evaluation manager in Free State, explained, *"With virtual evaluations, you don't always get the full picture. Remote data collection doesn't capture the contextual realities of different locations, making it harder to assess real program impact."* This perspective is consistent with previous research on digital governance, which suggests that public sector evaluations require mixed-method approaches to ensure comprehensive data collection (Bonfiglio, 2023). While VE offers efficiency and scalability, its perceived lack of contextual depth makes it less attractive for policymakers who rely on evaluations to inform budgetary and policy decisions.

Slow digital adaptation and institutional culture further exacerbate public sector resistance to VE. Many government agencies continue to rely on paper-based reporting, in-person site visits, and bureaucratic procedures that are fundamentally incompatible with the flexibility required for VE. Even when new digital tools are introduced, their integration into government systems is often delayed due to administrative bottlenecks and senior officials' lack of digital skills. As Participant GOV034, a mid-career evaluator from KwaZulu-Natal, explained, *"Government institutions don't change overnight. Even when introducing new evaluation tools, it takes years before they become standard practice."* This slow adaptation is widely recognized in public sector digital transformation research, emphasizing the need for strong policy incentives, training programs, and leadership buy-in before technological innovations are widely adopted (OECD, 2020). Findings from this study suggest that institutional inertia, resistance to decentralized evaluation models, concerns about digital data integrity, and the slow pace of bureaucratic reform are the most significant barriers to VE adoption in the public sector.

7.3.2 Technological Limitations and Infrastructure Gaps

Public sector institutions, particularly in developing contexts, continue to face severe technological limitations that hinder the effective adoption of VE. The findings of this study reveal that technological barriers are among the most significant constraints preventing the institutionalization of VE in government evaluation processes. Table 3 highlights that 20 respondents cited unstable internet connectivity and software compatibility issues as key challenges, reflecting broader infrastructure deficiencies in government offices. Many public institutions rely on outdated ICT infrastructure, with slow internet speeds, weak cybersecurity measures, and fragmented digital systems making it difficult to conduct VE efficiently. This aligns with broader discussions in the literature that emphasize the digital divide as a key determinant of technology adoption (Shevlane et al., 2023; United Nations Global Pulse, 2016). While developed countries have successfully integrated cloud-based platforms, AI-driven evaluation tools, and real-time data analytics in public sector monitoring, many developing nations struggle with even the most basic ICT capabilities, limiting their ability to transition to virtual methodologies (Reid, 2023).

In South Africa, infrastructure disparities between urban and rural government institutions exacerbate these challenges. Interviews with public officials revealed that while metropolitan-based departments have relatively stable internet access, municipal and provincial offices—particularly in Free State, Limpopo, and Eastern Cape—continue to experience frequent disruptions in connectivity. Participant GOV021, a government evaluator from Free State, explained: *“Our internet is unreliable, especially in remote government offices. If we can’t maintain a stable connection, how do we expect people to engage meaningfully in virtual evaluations?”* This issue is particularly relevant given the increasing reliance on cloud-based VE tools that require continuous internet access for data collection, analysis, and reporting. The TAM suggests that perceived ease of use plays a significant role in determining technology adoption; however, when infrastructure limitations create technological inefficiencies, public officials are less likely to perceive VE as a viable alternative to traditional evaluation methods (Anadon et al., 2016). This further supports the notion that while digital tools offer clear advantages in enhancing evaluation efficiency, their adoption remains contingent on institutional capacity and ICT readiness (McKinsey Digital, 2017).

Beyond internet instability, software incompatibility and digital literacy gaps were also identified as critical barriers to VE implementation. Public sector evaluation systems often operate on legacy software that lacks integration with modern VE platforms, resulting in frequent technical failures. As Participant GOV033, an IT specialist supporting government evaluation systems, noted: *“Government departments rely on outdated internal systems that don’t integrate well with modern virtual evaluation tools. This means that even when there’s an attempt to go digital, we still face technical failures.”* This underscores the challenge of transitioning from paper-based or manually conducted evaluations to digital frameworks, particularly in bureaucratic institutions that are slow to modernize their operational systems. Findings from the survey further reinforce this, with 10 respondents identifying a lack of digital literacy among stakeholders as a major barrier to VE adoption (Table 3). This challenge is consistent with existing research, highlighting that public officials, especially senior personnel who have spent decades working with traditional evaluation methods, often resist technological change due to inadequate training and exposure (Hejnowicz & Chaplowe, 2021). While TAM emphasizes perceived usefulness as a key driver of adoption, the absence of structured digital capacity-building programs in government institutions means that many officials lack the technical proficiency required to engage with VE tools effectively, leading to continued reliance on traditional, in-person evaluation approaches.

In addition to infrastructure deficiencies and software challenges, load shedding and power outages present another systemic barrier to VE adoption in South Africa’s public sector. Participant GOV026, a government evaluator from Limpopo, noted: *“We’ve lost virtual evaluation data multiple times due to unexpected power cuts. Government systems are not designed to safeguard digital data effectively.”* Unlike private-sector organizations that invest in backup power solutions and secure data storage mechanisms, government institutions often lack contingency plans to ensure the resilience of VE systems. This is a critical limitation, as VE relies on uninterrupted digital access for evaluation sessions, stakeholder engagement, and real-time data processing. Institutional Theory (Cheng et al., 2017) suggests that both formal policies and informal norms shape organizations. In the case of VE, the absence of institutional mechanisms to prioritize digital security and reliability has resulted in persistent technological inefficiencies. Government procurement and budgeting processes have not sufficiently prioritized ICT investment, further delaying the digital transformation of public sector evaluations (McKinsey Digital, 2017). Participant GOV018, a government procurement officer, described the challenge as follows: *“We can’t just buy software when we need it. It takes months of approvals, tender processes, and compliance checks before anything gets implemented. By the time we get the tools, they are already outdated.”* This highlights the bureaucratic inefficiencies in public sector procurement, where slow administrative processes make it difficult for government institutions to keep pace with technological advancements. Compared to private sector organizations, which adopt digital tools based on competitive needs and efficiency gains, the public sector remains constrained by procedural delays and regulatory hurdles that prevent the timely adoption of VE.

The combination of technological constraints, digital literacy gaps, and bureaucratic inefficiencies suggests that VE adoption in the public sector is not merely a technical challenge but a deeply embedded structural issue. While ICT-driven evaluation models have been successfully integrated into governance frameworks in countries such as Estonia, Canada, and South Korea (Gregory & Wilson, 2018), South Africa's experience reflects the broader struggles of developing nations attempting to modernize public administration. The literature emphasizes that VE has the potential to enhance efficiency, reduce costs, and improve stakeholder participation in policy evaluations (United Nations Global Pulse, 2016), yet without addressing infrastructure limitations and institutional resistance, its implementation will remain inconsistent. The findings suggest that beyond investment in ICT, government institutions must also implement structured training programs, digital security protocols, and procurement reforms to support the long-term viability of VE. As public-sector evaluations increasingly demand real-time data and adaptive decision-making, overcoming these barriers will be critical in ensuring that VE can be effectively institutionalized within South Africa's evaluation landscape.

7.3.3 Digital Literacy and Public Sector Capacity Deficits

The widespread lack of digital literacy among government officials and key stakeholders is a significant barrier to adopting VE in the public sector. The ability to navigate digital platforms, interpret data from virtual sources, and effectively conduct remote evaluations is not evenly distributed across public institutions. The study findings indicate that 10 respondents specifically cited digital literacy issues, with many government officials reporting difficulty using digital evaluation tools. The TAM underscores that the perceived ease of use of technology is a critical determinant of its adoption. When government officials struggle with digital literacy, their PEOU decreases, negatively impacting their willingness to engage with VE tools. This aligns with previous research by Anadon et al. (2016), highlighting that digital literacy remains a core challenge in developing countries, where training programs on technology adoption are often inadequate or inconsistently implemented.

Interviews further reinforced this issue, with multiple participants emphasizing that limited training on VE methodologies prevents meaningful engagement with digital platforms. One government evaluator from KwaZulu-Natal explained: *"Many officials struggle with even basic digital tools. Without serious capacity-building efforts, asking them to conduct a fully virtual evaluation is unrealistic."* This statement reflects the institutional challenges discussed by Cheng et al. (2017), who argue that public institutions are often slow to integrate new digital methods due to a lack of structured training and investment in human capital. Without targeted interventions, digital literacy deficits will continue to hinder the effective deployment of VE methodologies, creating reliance on traditional, in-person evaluations despite their logistical inefficiencies.

Beyond individual competency gaps, the study found that government training programs have not sufficiently incorporated VE techniques, leaving public officials ill-equipped to transition to digital methodologies. Institutional Theory (Scott, 2008) provides insight into why this occurs, suggesting that deeply ingrained bureaucratic norms and rigid administrative structures discourage the rapid adoption of new methods. Many government training modules still prioritize traditional M&E approaches, with limited efforts to integrate emerging virtual techniques. A respondent from Limpopo expressed frustration at the absence of structured capacity-building programs, stating: *"There is no formalized training on VE within most government departments. We are expected to learn on our own, but without structured guidance, adoption remains slow."* This lack of structured training exacerbates the digital divide within the public sector, as younger professionals who may have some familiarity with digital tools are often overshadowed by senior officials resistant to technology-driven change. As McKinsey Digital (2020) highlighted, governments that fail to invest in digital skills development often experience slow and fragmented technology adoption, leading to inefficient evaluation processes and increased reliance on outdated assessment methods.

The public sector's slow response to digital literacy training also affects its ability to institutionalize VE as a standard practice. Gregory & Wilson (2018) argue that public institutions require a sustained commitment to

professional development to ensure that digital innovations are effectively integrated into governance processes. The study findings reinforce this argument, as participants noted that government agencies rarely offer ongoing digital training tailored to VE methodologies. As a result, evaluators are left to rely on their initiative to acquire the necessary digital skills, which significantly slows the uptake of VE. Furthermore, the absence of peer learning structures—such as mentorship programs or cross-departmental knowledge-sharing initiatives—further isolates officials who lack confidence in using VE platforms. Without structured efforts to enhance digital literacy, the government will struggle to overcome the institutional resistance that currently limits the adoption of virtual evaluation methods.

7.3.4 Methodological and Data Security Concerns

Beyond operational and technological barriers, methodological and data security concerns are critical factors limiting the widespread adoption of VE in the public sector. As seen in Table 3, 28 respondents identified data privacy and security concerns, emphasizing the heightened risks associated with digital platforms in government evaluations. Public sector evaluations involve handling sensitive information related to policy performance, financial accountability, and service delivery outcomes. The transition to virtual methodologies introduces potential cybersecurity threats, unauthorized data access, and regulatory non-compliance risks. As Participant GOV014, a senior M&E officer from Gauteng, explained: *"Government evaluations handle highly sensitive data, from financial expenditure reports to impact assessments on vulnerable populations. Virtual platforms may lack the encryption standards required for regulatory compliance, exposing this data to cyber risks."* This statement reflects growing concerns about digital governance, where cybersecurity and data protection remain significant challenges in adopting e-Governance tools. The institutional barriers identified align with Institutional Theory, which explains how formal rules and compliance requirements shape technological adoption in public administration. Many government agencies struggle to implement VE due to a lack of standardized guidelines on safeguarding sensitive information within digital evaluation environments.

Further compounding the issue, 30 respondents cited concerns about bias in online data collection, a methodological limitation affecting VE findings' representativeness. Unlike traditional in-person evaluations, where evaluators can ensure diverse participation across geographic and socio-economic groups, VE relies on digital accessibility. This dependence on online engagement inherently excludes individuals with limited internet connectivity, digital literacy, or access to necessary technological devices, leading to biased data collection. As participant GOV029, a researcher from the Department of Economic Development, stated: *"We noticed that our virtual evaluations overwhelmingly reflected the views of urban professionals who had the means to participate. Meanwhile, the voices of lower-income and rural respondents were completely underrepresented, distorting our findings."* In the public sector, where policy decisions must reflect diverse stakeholder perspectives, this limitation creates hesitancy around fully adopting VE methodologies. Ensuring inclusivity in evaluation processes is particularly critical in government settings where policy interventions directly impact marginalized communities.

Additionally, participant hesitation and inconsistent responses in VE were cited as challenges, particularly concerning stakeholder engagement in digital environments. Unlike in-person evaluations, where evaluators can build rapport and probe deeper into responses, virtual platforms often limit interaction quality. Participants may be reluctant to provide candid feedback due to fears of digital surveillance, misused recorded responses, or uncertainty about the confidentiality of virtual platforms. As Participant GOV011, a program manager from the Western Cape, highlighted: *"Stakeholders are hesitant to speak freely in virtual evaluation settings. They worry that their responses are being recorded, monitored, or could be accessed by unintended parties, which makes them more reserved in their feedback."* These findings align with the TAM, which suggests that perceived risks, including security concerns and lack of trust in digital tools, significantly affect technology adoption. The perceived lack of security and privacy in VE diminishes its credibility among public officials, reinforcing their preference for traditional face-to-face evaluations, which allow for confidential, controlled environments that ensure data integrity and trust.

These methodological and security concerns illustrate why VE adoption in the public sector remains slow despite the potential benefits of digital evaluation tools. The need for stringent data protection policies, investment in digital security infrastructure, and strategies to mitigate online sampling biases remain unresolved challenges that significantly hinder the institutionalization of VE within government evaluations.

7.3.5 Cultural and Stakeholder Resistance to VE

The cultural dimension of public sector evaluations presents another significant barrier to adopting VE. Findings indicate that stakeholder engagement remains a persistent challenge, with three respondents highlighting cultural sensitivities as a major obstacle. Public sector evaluations often involve communities where direct, in-person engagement is deeply ingrained in governance and participatory decision-making. In such contexts, virtual interactions may be perceived as impersonal, detached, and insufficient in fostering the trust needed for effective data collection. As Participant GOV017, a community engagement officer in a social development program, explained: *"In the communities we work with, evaluation is built on personal relationships and face-to-face dialogue. Virtual platforms feel disconnected from the realities of the people we serve, making participation more difficult."* This resistance is particularly pronounced in participatory evaluation models, emphasizing collaboration, inclusivity, and interpersonal rapport as essential elements for generating meaningful insights (Cousins & Whitmore, 1998). VE methods, by contrast, limit evaluators' ability to observe non-verbal cues, establish credibility, and engage communities in iterative discussions, which are fundamental to participatory evaluations. Public sector officials working in social development, public health, and rural governance have expressed concerns that the shift to VE undermines the core principles of inclusive evaluation, particularly in settings where oral communication and informal consultations are central to decision-making processes.

Beyond cultural sensitivities, low response rates (two respondents) and stakeholder unwillingness to engage in VE (one respondent) further illustrate the difficulty of securing participation in virtual evaluation processes. Public sector evaluations involve multiple stakeholders, including civil society organizations, community leaders, and program beneficiaries. However, reluctance to engage with digital platforms reduces the effectiveness of VE, as non-participation skews data representation and reduces the legitimacy of evaluation findings. As Participant GOV026, a government program manager from Limpopo, noted: *"We struggle to get community stakeholders to engage in virtual discussions. Many feel excluded because they are unfamiliar with the technology or don't see it as a legitimate way to be heard."* This aligns with broader research on e-Governance adoption, which suggests that digital exclusion—stemming from limited digital literacy, access constraints, and cultural norms—can create participation gaps in technology-driven public sector interventions. Moreover, these findings underscore the broader institutional challenges identified under Institutional Theory, which explains how long-standing practices and norms shape public sector responses to technological change (Cheng et al., 2017; Gregory & Wilson, 2018). Given that public sector evaluations require consensus-building and legitimacy among diverse stakeholders, resistance to VE ultimately slows its adoption and limits its application in participatory governance settings. Without strong stakeholder buy-in, VE remains an incomplete and underutilized evaluation tool within the public sector. Without addressing these cultural and participatory challenges, government institutions may struggle to institutionalize VE fully, further entrenching reliance on traditional evaluation methods despite the potential advantages of digital assessment tools.

7.4 Enablers to the effective adoption of VE

7.4.1 Perceived Effectiveness and Feasibility of VE

Government officials who have utilized VE in public sector evaluations report that it offers significant advantages in terms of efficiency, accessibility, and cost reduction. The ability to conduct evaluations remotely eliminates the logistical challenges of travel and venue arrangements, making the process more streamlined and financially sustainable. As illustrated in Figure 4, most respondents expressed satisfaction with VE's effectiveness, citing its ability to expedite data collection and decision-making. Participant GOV014, a senior evaluator in the Department

of Health, highlighted this advantage: *"Previously, evaluations would take months due to travel and scheduling constraints. We've completed assessments in half the time with virtual tools while maintaining rigour."* This aligns with broader trends in e-governance and digital evaluation, where technology is increasingly leveraged to enhance efficiency in policy assessment (McKinsey Digital, 2020; Anadon et al., 2016).

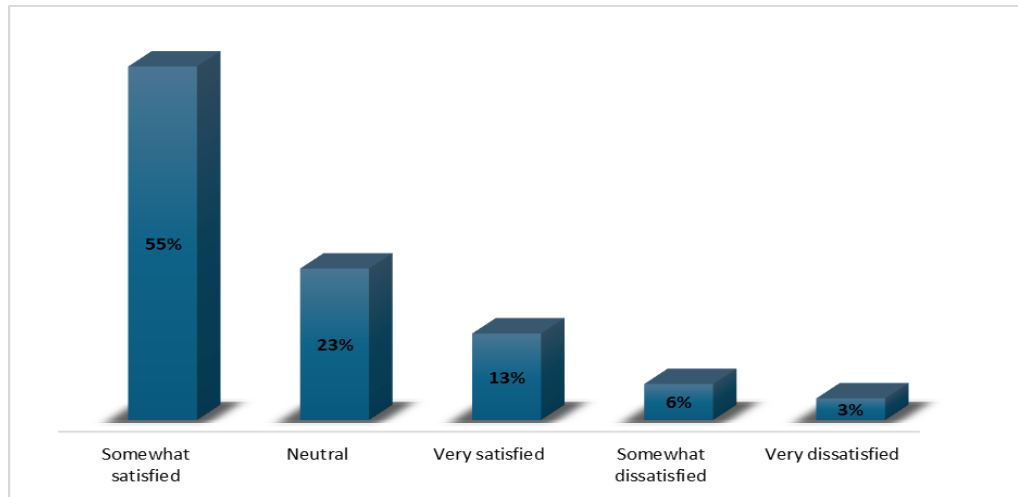


Figure 4. Satisfaction with VE Effectiveness

Source: own production

Beyond efficiency, the feasibility of integrating VE into public sector evaluation workflows has gained recognition. Figure 5 illustrates that many respondents found VE to be a practical alternative to traditional methods, particularly for evaluations requiring multi-stakeholder engagement. Remote tools have allowed for greater flexibility, enabling evaluators to conduct interviews, focus groups, and surveys without geographic limitations. Participant GOV027, an evaluator from the Department of Economic Development, explained: *"In many cases, we've found that VE is the only viable option. It allows us to reach key informants in different provinces without the usual logistical bottlenecks."* These findings suggest that VE is particularly well-suited for large-scale evaluations where in-person methods may be impractical. Cost-effectiveness is another major factor contributing to the perceived feasibility of VE adoption. Several government officials noted that virtual methods significantly reduce travel, accommodation, and venue hire expenses, allowing resources to be redirected toward more substantive evaluation activities. As Participant GOV035 from the Department of Social Development stated: *"Budget constraints are always a challenge. Virtual evaluations have allowed us to allocate funds toward more critical aspects of the evaluation process rather than logistics."* These cost-saving benefits align with findings from ICT-driven evaluation studies, emphasizing digital evaluation approaches' financial sustainability (United Nations Global Pulse, 2016).

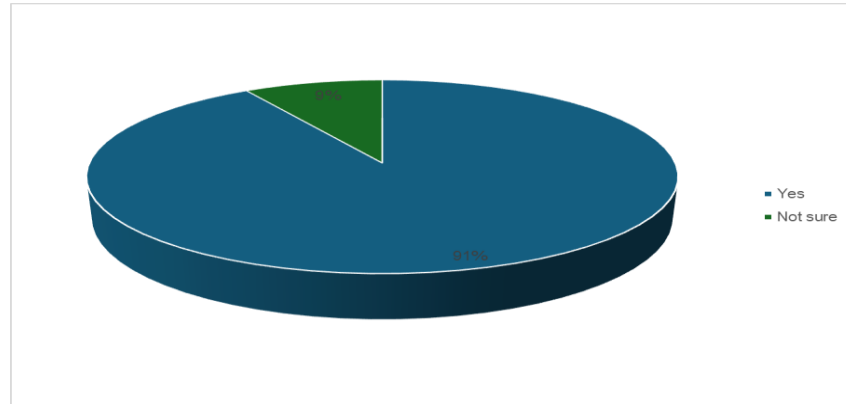


Figure 5. Feasibility of Integrating VE Methodologies
Source: own production

7.4.2 Institutional and Policy Support for VE Adoption

Successfully adopting VE in the public sector depends heavily on institutional commitment, leadership buy-in, and supportive regulatory frameworks. Government officials and evaluators widely recognize that VE adoption remains inconsistent and fragmented without a structured policy environment. Strong leadership commitment from government departments, particularly within M&E units, is critical in facilitating the integration of VE into standard public-sector evaluation practices. As previous digital governance initiatives demonstrated, leadership endorsement is crucial in influencing adoption rates and ensuring digital evaluation tools receive the necessary institutional backing (McKinsey Digital, 2020). Participant GOV011, a senior official in the DPME, emphasized this point: *"If VE is not championed at the highest levels, it remains a side project. We need leadership-driven policies that make it a mandatory evaluation approach rather than an optional alternative."* This statement underscores the importance of formalizing VE as part of national M&E policies to ensure sustained implementation across departments.

Regulatory frameworks also play a fundamental role in establishing clear guidelines for VE adoption. Several participants noted that one of the main barriers to VE implementation is the absence of standardized protocols governing virtual evaluation processes. Without clear policies on data security, evaluation ethics, and digital accountability, government departments remain hesitant to shift away from traditional evaluation methodologies. Figure 6 highlights that while there is an increasing intent to integrate VE into public sector evaluations, officials require stronger regulatory assurances to ensure that these methodologies meet compliance requirements. Participant GOV030, an evaluator from the Department of Public Works, stated: *"We don't have uniform policies that govern how VE should be conducted. Currently, each department is experimenting with its approach, making consistency challenging."* This reflects findings from public sector digital transformation research, which emphasize the need for cross-departmental alignment in policy frameworks to enhance the effectiveness of digital evaluation initiatives (United Nations Global Pulse, 2020).

Training programs and structured digital literacy initiatives further enhance VE adoption by addressing previous resistance among government officials. Findings indicate that a major impediment to VE adoption is the lack of digital competence among evaluators, particularly senior officials accustomed to traditional, in-person methodologies. Institutional support in the form of targeted training programs is therefore essential in bridging this gap. Several participants emphasized the importance of integrating VE training into broader capacity-building programs for government evaluators. Participant GOV024, a National School of Government training coordinator, explained: *"Most officials struggle with VE simply because they haven't been trained to use it. Resistance would decrease significantly if digital evaluation tools were incorporated into formal training programs."* This aligns

with the principles of the Technology Acceptance Model, which suggests that perceived ease of use and user confidence directly impact technology adoption rates. By investing in structured digital literacy initiatives, the government can equip officials with the skills needed to navigate VE platforms effectively, ultimately fostering greater acceptance and institutionalization of these methodologies.

Digital transformation strategies also play a critical role in fostering an enabling environment for VE adoption. Public sector agencies that have successfully implemented VE have done so within broader digitalization efforts to modernize governance processes. Several participants highlighted the importance of integrating VE into government-wide digital strategies to ensure sustainability. Participant GOV039, an ICT director from the Department of Cooperative Governance and Traditional Affairs (COGTA), noted: *"VE should not exist in isolation—it should be part of a larger government digital transformation agenda. Integrating it into national e-governance frameworks will make its adoption more seamless."* This perspective is consistent with global best practices, where countries that have successfully institutionalized digital evaluations have done so within broader digital governance frameworks that promote interoperability, standardization, and cross-sector collaboration (Cheng et al., 2017).

7.4.3 Technological Advancements and Infrastructure Investments

The effectiveness and sustainability of VE in the public sector depend significantly on technological advancements and strategic infrastructure investments. Improvements in digital connectivity, the expansion of cloud-based platforms, and the development of secure data management systems play a crucial role in strengthening the adoption of VE methodologies. Public sector institutions, particularly those in developing contexts, have historically struggled with inadequate digital infrastructure, which has hindered the feasibility of virtual assessment processes. However, as governments prioritize digital transformation, significant progress has been made in expanding high-speed internet access, particularly in urban and administrative hubs, thereby enabling smoother integration of VE in policy evaluation. Participant GOV017, an IT director from the Department of Digital Transformation, emphasized this shift: *"We've seen noticeable improvements in digital connectivity in key government offices. The challenge is ensuring that these advancements extend to municipal and rural institutions where evaluation processes often occur."* This aligns with findings from ICT policy studies, which highlight the importance of equitable infrastructure expansion to ensure that digital evaluation methodologies do not exacerbate existing digital divides (United Nations Global Pulse, 2020; McKinsey Digital, 2020).

One of the key technological enablers of VE is the adoption of cloud-based platforms that facilitate real-time data collection, storage, and analysis. Traditional evaluation processes rely on cumbersome paper-based reporting systems, making data retrieval inefficient and limiting accessibility. On the other hand, Cloud-based VE platforms provide centralized repositories for evaluation data, allowing evaluators, policymakers, and stakeholders to access information remotely while ensuring data security and compliance with regulatory standards. Participant GOV031, a senior M&E specialist from the Department of Health, noted: *"Cloud-based platforms have significantly improved our ability to manage evaluation data. Previously, data silos made it difficult to coordinate evaluations across different departments, but now, with secure cloud solutions, we can ensure data integrity and accessibility across government entities."* These insights align with global trends in digital governance, where cloud computing is increasingly leveraged to enhance public sector evaluation processes, improve data transparency, and enable multi-agency collaboration (Gregory & Wilson, 2018). Emerging technologies such as artificial intelligence (AI), blockchain, and real-time analytics are further transforming the VE landscape by increasing the reliability and accuracy of virtual evaluation methodologies. AI-powered tools are being deployed to automate data analysis, identify trends, and detect anomalies in evaluation datasets, thereby improving decision-making efficiency. Participant GOV022, an AI specialist in government digital services, highlighted the potential of these technologies: *"AI is helping us process large volumes of evaluation data faster and more accurately. It minimizes human error and ensures we can detect patterns that might be overlooked in manual"*

analysis.” Similarly, blockchain technology has been proposed to secure evaluation data, ensure tamper-proof records, and enhance data integrity. Public sector evaluators increasingly recognize blockchain's potential to authenticate evaluation findings, particularly in sensitive assessments where data security is a primary concern.

VE is also integrated into broader e-governance strategies to enhance M&E processes across government institutions. As governments shift toward data-driven policymaking, digital evaluation tools are embedded within national e-governance frameworks to ensure seamless data interoperability and improve policy monitoring. Participant GOV039, a director of public sector innovation, explained: *“Virtual Evaluation shouldn’t be treated as a standalone tool—it should be embedded in the wider digital governance ecosystem. When linked with e-Governance frameworks, VE becomes essential to public administration, enabling real-time performance monitoring and evidence-based decision-making.”* This perspective aligns with international best practices, where countries such as Estonia, Canada, and South Korea have successfully incorporated VE into digital governance ecosystems to enhance policy evaluation and service delivery effectiveness (McKinsey Digital, 2020; Gregory & Wilson, 2018).

7.4.4 Future Intent to Use VE in Public Sector Evaluations

The study findings reveal a notable shift toward the willingness to integrate VE into future public sector evaluation frameworks. While early resistance to VE stemmed from concerns over methodological rigour, digital infrastructure limitations, and institutional reluctance, the findings indicate that many government officials recognize its long-term benefits. VE is increasingly perceived as essential for government programs’ cost-effective, scalable, and real-time evaluation processes. Figure 6 highlights that a significant proportion of participants expressed a positive outlook on the continued use of VE, particularly in social policy evaluations, performance audits, and remote monitoring of development projects. This aligns with global trends in digital governance, where governments in countries such as Estonia, South Korea, and Canada have successfully embedded ICT-based evaluation methodologies into policy monitoring systems (McKinsey Digital, 2020; York & Bamberger, 2020). Public sector officials, particularly those from urban-based government institutions with stronger digital infrastructure, noted that VE enhances accessibility and efficiency, reducing the time required to conduct evaluations while allowing for broader participation across multiple locations.

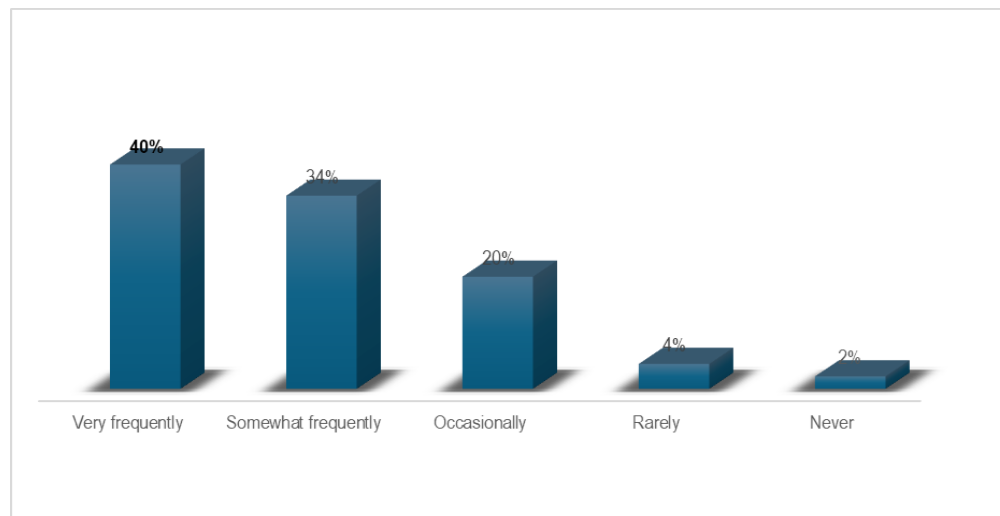


Figure 6. Future Intent to Use VE Methodologies

Source: own production

A key enabler of VE adoption is its ability to facilitate real-time policy tracking, particularly in crisis response scenarios. In recent years, governments worldwide have increasingly relied on virtual methodologies to conduct rapid assessments of emergency interventions, including pandemic response evaluations, disaster relief monitoring, and economic stimulus impact assessments (United Nations Global Pulse, 2021). This trend is also reflected in South Africa's public sector, where officials noted that VE provided an opportunity to collect and analyze data in real-time, thereby improving policy responsiveness. As Participant GOV025, a senior evaluator from the National Treasury, explained: *"When we need real-time data to track how public funds are being utilized, virtual evaluation provides an avenue to conduct oversight without delays. If integrated properly, VE could significantly strengthen accountability in public spending."* This statement supports arguments in digital governance literature that VE enhances transparency and accelerates evidence-based decision-making (Gregory & Wilson, 2018). However, some officials expressed scepticism, emphasizing that while VE enables rapid data collection, it does not automatically translate to improved accountability unless paired with robust verification mechanisms.

The generational divide in VE adoption was also evident in the study, with younger and mid-career public officials demonstrating greater openness to digital methodologies than senior officials. This aligns with findings in technology adoption research, which indicate that early-career professionals are more likely to experiment with digital tools due to their familiarity with technology in their daily work environments. Participant GOV031, a program manager in the health sector, noted: *"The more we use VE, the more we realize its efficiency. If the government invests in refining the systems and training officials properly, I don't see why VE wouldn't become a standard practice."* This statement underscores that while VE adoption is growing, sustained implementation will require structured training programs to enhance digital competency among government officials. This finding corresponds with the TAM, which posits that perceived usefulness and ease of use influence technology adoption. Officials who found VE to be intuitive and effective in streamlining evaluation workflows were more likely to express intent to continue using it in future projects. However, resistance remains among senior officials who view VE as requiring significant effort to integrate into established bureaucratic systems, reinforcing findings from Institutional Theory, which suggests that public sector organizations often resist digital transformation due to deeply embedded administrative norms and control mechanisms.

The future adoption of VE is also influenced by sectoral needs, with officials from the social development, education, and healthcare sectors expressing the strongest interest in using VE for ongoing program evaluations. This is largely attributed to the increased reliance on digital monitoring tools within these sectors, particularly for tracking service delivery outcomes in geographically dispersed communities. A senior education official (Participant GOV041) emphasized: *"Education sector evaluations require continuous tracking of interventions, and VE provides an opportunity to conduct follow-ups without requiring in-person visits to every school district. This is especially relevant for rural schools where physical access is limited."* This statement aligns with global trends in digital education monitoring, where governments have increasingly leveraged cloud-based platforms to track student performance, teacher training programs, and school infrastructure development (Letouzé, 2013). The healthcare sector has similarly recognized the value of VE in evaluating public health interventions, with some officials highlighting its use in monitoring vaccine rollout programs and telemedicine initiatives. These findings suggest that while VE adoption may be slower in sectors with high regulatory constraints, its potential for cost-effective and scalable evaluation is gaining recognition in policy-relevant fields.

Despite this increasing intent to use VE, concerns remain regarding data security, stakeholder engagement, and methodological reliability. Several officials cautioned that its future use may be sporadic rather than systemic without clear government policies on VE implementation. Participant GOV038, an evaluator in the economic development sector, warned: *"We've seen enthusiasm for digital tools before, but without institutional policies, they don't last. For VE to work long-term, it must be integrated into national evaluation frameworks with clear guidelines and accountability measures."* This reflects findings in institutional governance literature, which argue

that the sustainability of digital innovations in the public sector depends on regulatory support and long-term capacity-building efforts (United Nations Global Pulse, 2016). Thus, while officials recognize VE's potential, its success as a standard evaluation method will hinge on the government's ability to create enabling policies, invest in secure digital systems, and ensure that VE methodologies align with broader public sector governance objectives.

8. Lessons Learned, Implications, and Emerging Best Practices for Public Sector VE

The study's findings reveal critical lessons regarding adopting VE in the public sector, highlighting structural barriers and enabling conditions that shape its implementation. One key takeaway is the importance of balancing technological advancements with institutional capacity-building. While VE offers significant benefits regarding efficiency, accessibility, and cost reduction, its effectiveness depends on digital literacy, stakeholder buy-in, and robust ICT infrastructure. Public officials who have successfully integrated VE emphasize the need for structured training programs, regulatory clarity, and leadership support to mitigate resistance. This aligns with the TAM, which posits that technology adoption is influenced by perceived usefulness and ease of use. Institutional inertia remains a significant challenge, as government agencies operate within rigid bureaucratic frameworks that favour traditional evaluation methods. However, case studies from digital governance models in Estonia, South Korea, and Canada suggest that strategic policy interventions, such as formalizing VE guidelines and investment in digital security protocols, can accelerate adoption (McKinsey Digital, 2020).

The implications of these findings extend beyond technological constraints to the broader governance landscape. VE is not merely a technical shift but a systemic transformation that requires changes in institutional culture, evaluation methodologies, and stakeholder engagement practices. Public sector evaluations often operate within complex political environments where trust, transparency, and data credibility are paramount. The study highlights that resistance to VE is partly rooted in concerns over data validity and fears that virtual methods may fail to capture contextual nuances essential for policy evaluation. Institutional Theory supports this concern, as public organizations tend to resist change due to established norms, regulatory constraints, and hierarchical structures that make digital transitions difficult (Gregory & Wilson, 2018). Addressing these concerns requires a hybrid evaluation model that integrates digital tools while preserving elements of direct engagement where necessary. Furthermore, governments must develop legal and ethical frameworks to govern VE practices, ensuring compliance with data protection regulations and minimizing biases in online data collection (United Nations Global Pulse, 2021). These measures are crucial for positioning VE as a sustainable and effective approach to policy assessment.

Emerging best practices in VE highlight the importance of multi-stakeholder collaboration in strengthening its implementation. Successful VE initiatives globally demonstrate that partnerships between government agencies, technology providers, and academic institutions can drive digital innovation in public sector evaluations (Hejnowicz & Chaplowe, 2021; Cintron & Montrosse-Moorhead, 2022). For instance, governments that have incorporated artificial intelligence, blockchain, and real-time analytics into VE processes report higher levels of data security, improved stakeholder engagement, and enhanced decision-making capabilities. Evidence from digital governance initiatives suggests that mainstreaming VE into broader e-governance strategies—rather than treating it as a standalone tool—can lead to greater institutional acceptance. Ensuring VE aligns with national digital transformation agendas and public administration reforms increases its legitimacy and fosters long-term adoption.

The study's findings also indicate that a forward-looking approach is necessary for scaling up VE adoption in the public sector. Public institutions must move beyond pilot projects and embed VE within official evaluation policies and procedures. This requires sustained investment in digital infrastructure, professionalization of VE skills among public officials, and a shift toward open-data evaluation frameworks that enhance transparency.

Lessons from global best practices suggest that incentives such as performance-based funding mechanisms, digital literacy certification programs, and cross-sector learning platforms can further encourage VE adoption (Gregory & Wilson, 2018; McKinsey Digital, 2020). Ultimately, the success of VE in government evaluations will depend on a strategic combination of technological readiness, institutional reform, and stakeholder engagement, ensuring that virtual methodologies enhance rather than replace the fundamental principles of public sector evaluation.

Conclusion and Areas for Future Research

This study examined the barriers and enablers influencing the effective adoption of VE in the South African public sector. Drawing from empirical data—including survey responses, interviews with government officials, and a comprehensive literature review—the research set out to answer two core questions: (1) What factors hinder the institutionalization of VE in public sector evaluation systems? and (2) What conditions facilitate the integration of VE into public governance frameworks? The findings reveal that while VE holds promise as a scalable and efficient tool for public sector monitoring and evaluation, its implementation is constrained by institutional inertia, infrastructural gaps, digital literacy limitations, and weak regulatory and policy support. Conversely, enablers such as perceived cost-effectiveness, emerging digital infrastructure, leadership commitment, and stakeholder satisfaction with VE outcomes offer a path forward for its institutionalization.

The novelty of this study lies in its context-specific exploration of VE adoption within South African governance structures—an area often underrepresented in global M&E discourse. Unlike most evaluations focusing solely on technological capabilities, this research integrates the TAM and Institutional Theory to provide a dual-level analysis of individual and organizational dynamics that shape VE uptake. This theoretical contribution enhances our understanding of why digital evaluation tools are accepted in some institutional settings and resisted in others, offering a nuanced framework for policy intervention. In addition, the study presents empirical insights based on real-world challenges and perspectives from frontline evaluators, many of whom navigate complex bureaucracies that are slow to adopt innovation.

Despite these contributions, the study is not without limitations. First, it relies on self-reported data from a limited sample of government officials, which may introduce bias or restrict generalizability. Second, while it captures insights from diverse provinces and departments, it does not comprehensively account for the varying levels of digital maturity across all spheres of government. Third, the study focused primarily on the South African context due to time and resource constraints and may not fully reflect broader continental or global VE dynamics. Finally, the rapidly evolving nature of technology means that any static assessment of VE systems risks becoming outdated without longitudinal follow-up.

Future research should explore the long-term institutionalization of VE within the broader landscape of digital governance in the Global South. Key areas of inquiry include examining how governments can integrate advanced technologies—such as artificial intelligence, blockchain, and predictive analytics—into their evaluation ecosystems without compromising ethical standards or data protection. Additionally, comparative case studies between digitally advanced and under-resourced public institutions can provide valuable insights into best practices and scalable models of VE adoption. Investigating the role of political leadership, interdepartmental coordination, and civil society engagement in accelerating VE uptake would further enrich the field. As digital transformation continues to reshape public administration, ensuring the effective use of VE will be central to enhancing accountability, transparency, and evidence-informed policymaking.

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EXPLORING RENEWABLE ENERGY FUTURE THROUGH HOUSEHOLD ENERGY BEHAVIOUR: CASES OF LITHUANIA AND MOROCCO*

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Abstract. The study examines the role of household energy behaviour in the transition to renewable energy, focusing on the comparative cases of Lithuania and Morocco. In both countries, households account for approximately 1/4 of total energy consumption, making them a key area for promoting energy efficiency and sustainability. Lithuania and Morocco have different approaches driven by their economic, cultural, and political environments. In Lithuania, household energy behaviour is influenced by efforts to promote using more energy-efficient appliances and renewable energy sources. Public policy and support are focused on building renovations, small-scale renewable energy production in households, and electrification of the transport sector, all of which are supported by public subsidies. Additionally, introducing energy-efficiency measures aims to reduce household energy consumption further. Morocco, on the other hand, emphasises large-scale renewable energy projects, such as the Noor Solar Complex, while targeting households with energy efficiency campaigns and providing financing mechanisms to make renewable energy technologies more accessible, thereby encouraging a more passive role in direct energy generation but active participation in energy-saving practices. The study uses a comparative case study approach, drawing on secondary data from sources such as the International Energy Agency (IEA) and national reports. The main findings show the importance of economic incentives, public awareness, and tailored policy interventions in shaping energy behaviour. Although there is public support for renewable energy in both countries, barriers such as financial costs and information gaps remain. The study provides insight into ways to involve households in the energy transition, highlighting the need for effective communication and strategic policies.

Keywords: household energy behaviour; renewable energy transition; Lithuania, Morocco; comparative case study

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JEL Classifications: D12, Q41, Q 40, Q56

Additional disciplines: sociology; information and communication

1. Introduction

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Household energy consumption constitutes a significant portion of global energy use, accounting for approximately 30% of total energy consumption. This makes it a crucial factor in shaping the future of renewable energy. The transition towards renewable energy depends not only on technological advancements but also on the capacity of societies to adopt sustainable energy practices at the household level. Households contribute to this transition by adopting energy-efficient technologies, generating energy through home-based renewable systems, and supporting broader national energy policies aimed at sustainability and resilience.

However, how households use energy varies significantly between regions, influenced by economic development, energy availability, and cultural contexts. Understanding these differences is essential for designing effective strategies for energy transition. This study, therefore, focuses on a comparative analysis of household energy behaviour in Lithuania and Morocco. Despite their geographic and economic differences, this comparison is particularly valuable due to both countries' shared challenges in transitioning to sustainable energy sources and their substantial investments in renewable energy. Morocco's significant solar projects, like the Noor Solar Complex, and Lithuania's balanced investments in solar, wind, and biofuels highlight different pathways toward a common goal. Analysis of these variations provides new insights into the potential trajectories of renewable energy adoption at the household level.

Moreover, this comparison gains further relevance when considering that household energy consumption in both countries represents around one-fourth of total final energy use. In 2023, households in Lithuania used about 25% of the total final energy, primarily for heating, with additional consumption for appliances and lighting (IEA, 2023 a,b). Similarly, Moroccan households account for approximately 25% of the country's final energy consumption, including energy for heating, cooking and lighting (Enerdata, 2023). The figures underscore the importance of focusing on energy efficiency and renewable energy solutions in the residential sectors of both countries to reduce overall consumption and improve sustainability.

The analysis of household behaviour in a border context is important as a significant contribution to the transition to renewable energy and energy consumption in general (Tvaronaviciene, 2024). Energy efficiency and locally generated renewable energy can address uncertainties in energy supply, price volatility, and climate targets. Governments have responded to these challenges through various measures, including targeted subsidies, incentives for renewable installations, and campaigns to reduce energy demand. According to the IEA (2023 a), changes in household energy behaviour can reduce global energy demand by up to 18% by 2030, highlighting the substantial impact of consumer practices on overall energy use (IEA, 2023 c,d). At the 8th IEA Annual Conference on World Energy Efficiency, energy ministers globally emphasised that behavioural changes, alongside technical efficiency, are key to reducing consumption.

The primary objective of this study is to explore the differences and similarities in household energy behaviour between Lithuania and Morocco and to understand how these behaviours contribute to energy resilience and the broader transition to renewable energy. The study aims to provide information on the role of household energy practices in supporting national energy goals and addressing global energy challenges.

The research question in this article is: How do household energy behaviours in Lithuania and Morocco contribute to energy resilience and the transition towards renewable energy, and what factors influence these behaviours in each country?

The study uses a comparative case study approach to analyse the energy behaviour of Lithuanian and Moroccan households. This approach explores how households in each country contribute to the transition to renewable energy. Data for the study were collected from secondary sources, including reports from the International Energy Agency (IEA), national energy strategies, and household energy behaviour surveys. The analysis focuses on the

main factors influencing household energy behaviour, such as economic conditions, access to energy technologies, and policies to promote renewable energy. By comparing these data, the study aims to identify common challenges and opportunities to strengthen the sustainable energy transition in the residential sectors of both countries.

2. Theoretical background

2.1. Definition of household energy behaviour

Household energy behaviour is the term used to describe people's choices about using energy in their homes. Modern approaches extend beyond just saving energy, including decisions about energy-efficient renovations (Pelenur, 2018), installing energy-saving appliances, and integrating renewable energy technologies (Alberini, 2018). Several factors, such as socioeconomic status, cultural norms, environmental awareness, and access to energy-saving technologies, influence this behaviour. Key factors affecting energy behaviour include income level, energy prices, household size, and the efficiency of appliances and buildings. Psychological and social influences, such as habits, attitudes towards energy savings and social norms, also play an essential role. Studies indicate that educational campaigns and financial incentives can effectively encourage household energy-saving behaviour (Ślupik, 2021; Bhattarai et al., 2024; Qiao & Lin, 2024). However, the energy behaviour of households is challenging to characterise due to the interplay between these factors, which can vary considerably between regions and demographic areas (Simionescu et al., 2020; Tvaronavičienė, 2024).

The environmental impact of household energy consumption is considerable, as residential energy use significantly contributes to global greenhouse gas emissions. Therefore, promoting sustainable household energy behaviour is crucial to achieving environmental sustainability objectives. Potential measures and strategies to influence the energy behaviour of households include improving energy efficiency through retrofitting and refurbishing buildings, promoting the usage of renewable energy technologies, and implementing policies to encourage behavioural change toward energy savings (Han et al., 2021). It is important to note that the household's energy behaviour includes energy consumption at home and vehicle ownership. In regions with a rapid increase in the use of electric vehicles (EV), these have reduced the overall energy consumption of cars, thus contributing to carbon neutrality (Yin, 2024). Evidently, policies that shape household energy behaviour considerably affect energy consumption. Policymakers and practitioners can develop more effective interventions to reduce energy consumption and mitigate environmental impacts by understanding the motivations and barriers.

2.2. Factors affecting household energy behaviour

Various situational factors and lifestyle patterns shape household energy behaviour. The perceived behavioural change varies between individuals and contexts, influencing how people adopt energy-saving behaviours and actively participate in the energy market. Situational factors such as access to electricity, efficient energy sources, and modern household technologies are essential in determining household energy consumption patterns (Kuhe & Bisu, 2020). Lifestyle also significantly impacts energy use, with daily routines and energy-consuming appliances being key considerations when analysing household energy behaviour. SCOPUS AI generated Concept map, generated after entering the phrase “Renewable Energy Future through Household Energy Behavior”, is presented below in Figure 1.

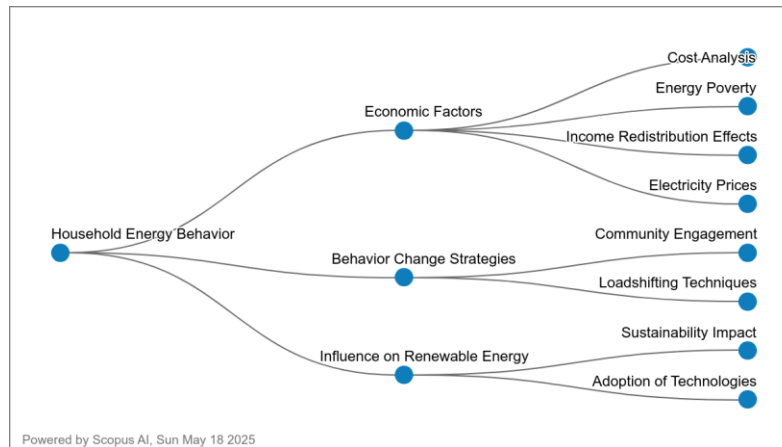


Figure 1. SCOPUS AI generated a Concept map after entering the phrase “Renewable Energy Future through Household Energy Behavior.”

Household behaviour greatly affects greenhouse gas (GHG) emissions. Behavioural changes, such as energy-efficient renovations, installing energy-saving appliances, and using renewable energy technologies, can significantly reduce emissions (Balezantis et al., 2024).

Households' attitudes towards renewable technologies and their knowledge about energy consumption are crucial for adopting sustainable energy systems (Brown et al., 2023). It is important to emphasise that household energy consumption can be changed through various interventions and policies. Promoting renewable microgeneration technologies is a critical intervention to reduce energy consumption and encourage the uptake of renewable energy solutions in households. Assessing households' willingness to pay for energy renovations, energy-efficient appliances, and renewable energy technologies can provide valuable insights for developing effective policies and measures to reduce GHG emissions (Balezantis et al., 2024). These strategies can significantly promote sustainable household energy behaviour and mitigate environmental impacts (Heinrich et al., 2022).

Theoretically, two behavioural interventions dominate energy policy implementation: reward and social comparison. A reward-based strategy is based on the promise that households will save energy by changing their behaviour. Reward-based interventions have been shown to significantly impact household energy behaviour, leading to reductions in energy consumption (Tiedemann, 2009). The social comparison strategy is based on feedback, such as home energy reports. It has also been shown to be more effective in promoting household energy and conservation behaviour than reports based on historical comparison.

The dominant strategy for encouraging behavioural change in household energy consumption is reward-based, particularly through initiatives that motivate households to participate in community projects and invest in energy efficiency improvements.

The availability of new, affordable technologies is an important stimulus (Sotnyk et al., 2023; Brown et al., 2023). For example, motivating households to improve their buildings' energy performance can lead to better indoor environmental quality (IEQ) and greater energy efficiency (Ghita & Catalina, 2015). Renovated and newly constructed buildings typically achieve better IEQ and energy performance than older structures (Prozuments et al., 2023). The primary goal of these upgrades is to reduce energy consumption, particularly heating. In addition, these upgrades are being introduced as they can reduce the energy required for heating, hot water and electricity in homes. Technologies like heat recovery ventilation systems and exhaust air heat pumps can improve district heating systems' efficiency, reducing energy use and CO₂ emissions in retrofitted homes. In addition,

incorporating solar district heating systems in these buildings can significantly reduce CO₂ emissions and help countries meet their emission reduction targets (Rehman et al., 2020; Gargasas, Bazienė & Dzienis, 2023).

Overall, reward-based strategies can be promoted. There is considerable evidence that they encourage changes in household energy behaviour.

3. The context of household energy behaviour: energy sector in Lithuania and Morocco

Lithuania and Morocco differ significantly in geography, geopolitics, culture and economy, leading to different approaches to energy policy. Despite these differences, both countries have set clear climate and environmental goals, committing to international agreements and establishing national targets to reduce carbon emissions and increase the use of renewable energy. However, the progress and implementation methods vary between the two countries.

The *first* difference between the countries to be considered is the varying *goals and achievements* of the energy policy. Following the implementation of the National Energy Independence Strategy, Lithuania ceased importing energy from Russia in 2022 and is committed to meeting all its electricity needs from renewable sources by 2030 and achieving climate neutrality by 2050. Lithuania has a national energy independence strategy, which has been adopted and periodically updated since 2012. The strategy forms the basis for structural reforms in the energy sector. This is in response to the high prices of energy resources and the use of energy as a political tool. Lithuania has a terminal for liquefied natural gas (LNG), which allows it to import natural gas from any LNG trading supplier (Energetikos Ministerija, n.d.). However, to achieve further energy independence, there is a need for a rapid increase in investment in clean energy. The National Energy Independence Strategy identifies renewable energy as a key objective. The objective is to increase the proportion of renewable energy in the final energy consumption balance, thus reducing dependence on fossil fuel imports. The long-term energy policy aims to achieve complete energy sector decarbonisation by 2050 (Energetikos Ministerija, 2024).

Morocco's energy strategy focuses on reducing reliance on fossil fuels, which constitute about 90% of its energy consumption, and increasing energy security through developing renewable energy projects. The country's National Energy and Energy Efficiency Plan launched in 2008 aims to reduce the country's carbon footprint and energy production costs. The plan prioritises energy efficiency and aims to increase renewable energy production equally from wind, solar, and hydroelectric sources to achieve a more balanced and resilient energy sector (SDG, n.d.). However, Morocco's energy sector relies heavily on fossil fuels, representing approximately 90% of its total energy consumption. The country's energy consumption includes significant shares from coal (30.8%) and fuel oil (56.4%) (IEA, 2023 c). Despite this dependence, Morocco is increasing its share of renewables in its energy mix. At the end of 2022, renewables accounted for 38% of the country's total electricity capacity, with ambitious plans to increase this to 52% by 2030 (ITA, n.d.).

The *second* difference between countries lies in the trends in *household energy consumption*. On the demand side, residential consumers must improve efficiency and use more energy from renewable sources. Household energy consumption accounted for 28.4 per cent and is falling year-on-year (Statistics Lithuania, 2023). To achieve this goal, the Lithuanian government has allocated approximately €265 million in support for residential solar power plants from 2021 onward, with a total capacity of 1.33 GW of household power plants, representing more than half of the country's total solar power capacity (Energetikos Ministerija, 2023). The involvement of producing consumers has become a pivotal element in the advancement of solar energy in Lithuania, contributing considerably to the reduction of dependence on imported electricity.

Morocco has witnessed a notable shift in household energy consumption trends, primarily driven by the country's strategic initiatives to enhance electrification and expand energy access. Most rural areas now have access to

electricity, which has resulted in a consistent increase in household energy consumption. The data reveal a 5% annual growth in national demand for primary energy, driven partly by increased household electricity consumption. This consumption increased at an average rate of 6% per year due to widespread electrification and economic growth in rural areas. The national energy strategy emphasises promoting energy efficiency and integrating renewable energy sources to meet increasing demand. The strategy includes developing renewable energy projects and improving energy efficiency across various sectors (MoF, n.d.).

The *third* difference lies in the *renewable sources of energy*. Analysing the structure of renewable energy sources reveals striking differences between countries. Lithuania relies heavily on biofuels as a source of renewables, whereas Morocco prioritises solar and wind energy. The primary source of renewable energy in Lithuania is biofuels (firewood, wood waste and agricultural waste), most of which are used for electricity generation and central heating (51.8%) in households (34.1%) (Statistics Lithuania, 2023b). Recent government initiatives have encouraged energy-producing consumers, positioning these power plants as a popular solution for residential energy needs. Subsidised household solar power plants are specifically designed to generate domestic electricity and improve the efficiency of home heating systems. Subsidies have had the effect of converting around 7% (100k) of households into electricity producers, which has significantly contributed to more than 2/3 of the electricity generated in Lithuania in 2023 coming from renewable sources, while electricity consumption from the grid has fallen by 1.2% per year (Energetikos Ministerija, 2023a). All this shows the essential changes in the energy consumption behaviour of households in Lithuania.

Meanwhile, Morocco's renewable energy sector is recognised for its significant investment in solar energy, particularly the Noor Solar Project. Morocco is making notable progress in developing large-scale renewable energy projects, with the Noor Solar Project being the most prominent. The aim is to provide reliable, sustainable, and affordable energy. However, it should be noted that reducing energy intensity in the Moroccan economy remains a challenge. Currently, the share of renewable energies in the total installed capacity is 38% (MoF, n.d.), while renewable energy accounts for less than 10% of the total energy supply (IEA 2023 a). The increasing energy demand, averaging 3% per year (Enerdata, 2023b), has hindered a substantial increase in the share of renewables in total final consumption over the last decade. A significant portion of fossil fuel energy is consumed by households, prompting the government to set targets for using renewable energy in homes (IEA, 2023 c). The Moroccan government has taken several initiatives to promote renewable energy and improve energy efficiency among household energy users. The most prominent initiative, as mentioned above, is the Noor Solar Plan, which provides electricity generated at the solar power plant to users. Additionally, the government has expanded the access to electricity to rural areas through renewable energy sources. Energy efficiency programs that promote energy-efficient appliances have also been designed to reduce household energy consumption.

In summary, Lithuania's energy strategy for households encompasses multiple facets: ensuring the provision of clean energy (both heat and electricity) from renewable sources within the centralised supply system and encouraging households to produce and supply their electricity from renewable sources, mainly small solar power plants. On the contrary, Morocco's energy strategy focuses primarily on large-scale renewable energy projects, positioning households as passive consumers of the provided energy.

4. Household energy behaviour: a case of Lithuania

Household energy consumption. In Lithuania, household energy consumption primarily focuses on space heating, representing around 63.5% of final energy use in the residential sector in 2022. Heating and cooking of water also represented significant portions, covering 14.9% and 6.3%, respectively. Electricity for lighting and other electrical appliances represented 13.9% of household energy use (Eurostat, n.d.).

The primary energy sources used in Lithuanian households include solid biofuels, natural gas, and electricity. In 2022, about 34.1% of the renewable energy consumed in households was sourced from firewood and wood waste, a significant component of household energy use, especially for heating purposes (Statistics Lithuania, 2023a). Other renewable sources, such as solar and wind energy, play a more minor but growing role in household energy consumption. This is important, as household gas prices increased significantly between 2020 and 2022 due to the geopolitical situation but have decreased since then. Overall, Lithuania is working to increase the share of renewables in household energy consumption to achieve complete self-sufficiency in energy by 2050.

Patterns in household energy behaviour. The literature on household energy behaviour in Lithuania represents three main patterns.

First, there has been a notable pattern in how households adopt technologies for producing and using renewable energy at home and for private transportation. Installing renewable energy technologies in households has an important positive effect, as it helps reduce energy transmission losses. In a study of Lithuanian households with small solar power plants, researchers found that energy flows between the household and the distribution grid are reduced by about 10% of the total annual energy flows between the household and the distribution grid; for smaller systems (less than 10 kW), this value can be even higher (18% or more) (Riupa et al., 2022). This represents significant savings in electricity transmission. In addition, households where small solar systems are installed tend to change their electricity behaviour. Households that install rooftop solar panels are found to be more aware of their energy consumption as they are more likely to monitor their energy use through apps or smart meters. They are more likely to use the energy immediately rather than send it to the grid, saving money. With solar power systems, households shift their energy usage to times when solar production is highest (midday), leading to changes in consumption patterns (Hubert et al., 2024). As a result, households using renewable energy tend to use less electricity from the grid, incentivising energy savings and reducing CO₂ emissions. One of the most significant factors influencing the adoption of renewable energy technologies in households is the decision-making process concerning renewable energy by households. Public policy plays a crucial role in this process by reducing barriers to adopting renewable energy through subsidies offered to households that implement renewable energy production and efficiency technologies.

Second is the pattern of willingness to accept renewable energy in their homes. The survey conducted in Lithuania revealed positive trends in household energy behaviour, with more than 60% of households wanting to use renewable energy sources to produce heating, air conditioning, hot water or electricity at home (Štreimikienė et al., 2022). This is done both to minimise environmental impact and to save energy. This is linked to both the desire to reduce environmental impact and the desire to save energy.

Still, there are several common barriers that traditional renewable energy policies are unable to overcome in Lithuania (Štreimikienė et al., 2022): (1) high upfront costs and long payback periods, (2) lack of information and knowledge, (3) low environmental priority, (4) resistance to change, and people's habits. A representative survey of the Lithuanian population showed that 60% of the respondents are unwilling to pay extra for renewable electricity. Furthermore, the same study showed that most Lithuanian households surveyed (62.5%) use biodiesel or bioethanol in their cars. However, only 5.5% of the respondents use electric or hybrid cars. Nevertheless, 62% of respondents would like to buy an electric or hybrid car, but 74.9% face financial difficulties in purchasing an electric or hybrid car despite government support for such vehicles (Štreimikienė et al., 2022). A more detailed study in Lithuania reveals different public attitudes towards different types of renewable energy. Although most of the population supports using green energy, there is a notable reluctance to adopt bioenergy, especially biomass (Liobikienė, Miceikienė, 2002). This is even though biomass accounts for Lithuania's largest share of district heating. The negative perception of biomass is particularly pronounced regarding its use in private transport.

To overcome this negative attitude, financial mechanisms emerged as the most influential in shaping attitudes toward bioenergy. Importantly, individuals who consider financial support critical also tend to be more knowledgeable about bioenergy, indicating that the Lithuanian population understands the essential role of government support. This suggests that subsidies and financial incentives could motivate people to adopt bioenergy.

Third, there is a pattern in willingness to decrease energy consumption at home. The survey shows that 67% of the population often or always takes active measures to save energy in Lithuania (Figure 2).

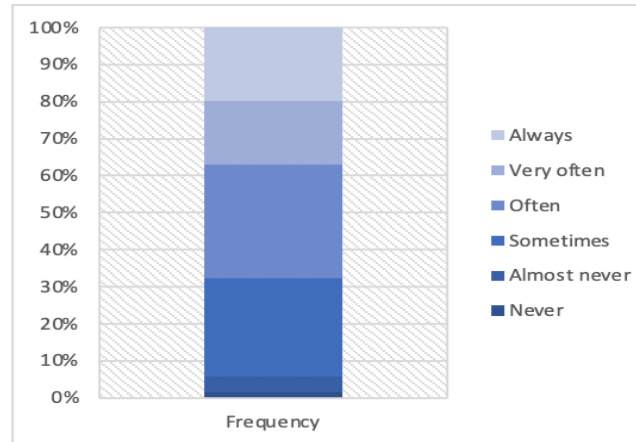


Figure 2. Frequency of energy-saving actions in daily life: survey responses on energy conservation measures
Source: Telešienė et al., 2024

According to the data, 74.3% of the population intends to take measures to reduce their energy consumption in the future (Figure 3). This intention is based on the belief that using less energy will reduce the impact of the household on the environment. In Lithuania, 67.8% of the population believes in this effect. Furthermore, household representatives believe that it is up to them to take measures to reduce energy consumption (72.2%) (Telešienė et al., 2024).

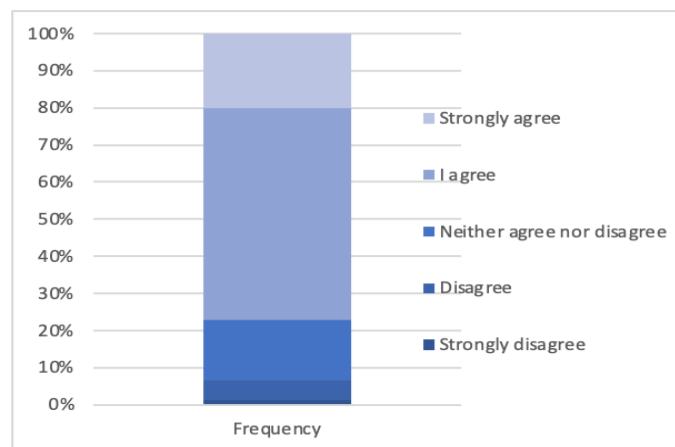


Figure 3. Frequency of intention to take measures to reduce energy consumption in the future
Source: Telešienė et al., 2024

As the above data show, the population believes that their household energy consumption is highly dependent on their choices, so information on renewable energy can significantly change the composition of household energy consumption. According to the survey (Štreimikienė et al., 2022), more than 30% of respondents have information about possible support measures for renewable energy in the household, 45.6% of respondents have heard about possible support measures but lack some information (Štreimikienė et al., 2022). Consequently, disseminating information on renewable energy options in the home can be more efficient.

According to Streimikiene (2022), community-based social marketing (CBSM) can be used as a tool to promote the reduction of household greenhouse gas (GHG) emissions through behavioural change. The results of the replicated study show that households can significantly reduce GHG emissions, saving energy and money without significant investments.

Although the use of renewable energy in Lithuania has increased significantly due to government policies, the full potential of using renewable energy in households is still unused due to household behaviour, which can be changed by providing more information to residents.

4. Household energy behaviour: a case of Morocco

Household energy consumption. Households are Morocco's second largest electricity consumer; therefore, household energy behaviour is making a tremendous impact on energy consumption in the country. Energy consumption is concentrated in cooking, water heating, and space heating, with significant regional variations due to climatic conditions. In Morocco, around 38% of household energy consumption is used for cooking, 24% for heating, and 24% (IEA, 2023a), with no consumable channels over time (Iysaouy, 2019). Moroccan households' main energy sources are butane gas, electricity and biomass. Butane gas is a widely used energy source, especially for cooking and water heating, as it is available to households through public subsidies. Electricity is used for lighting and electrical appliances and is becoming more widespread in rural areas, accounting for around 18% of household energy consumption (IEA, 2023a). In rural areas, biomass, especially firewood, remains an important energy source, particularly for cooking and space heating (MoF, n.d.).

Renewable energy sources, such as solar energy, are slowly penetrating Moroccan households. Solar water heaters are becoming more common, especially in newer developments and in urban areas. However, their overall contribution to household energy production is still low compared to traditional sources (Enerdata, 2023 b).

Patterns in household energy behaviour. The literature on household energy behaviour in Morocco is subject to some different patterns than in Lithuania.

First, Moroccans, in general, are very aware that renewable energy is part of climate change mitigation and strongly support renewable energy projects in the country. Large-scale surveys near renewable energy installations, such as the concentrated solar power project in Ouarzazate, show that most respondents understand the importance of switching to renewable energy. Around 91% of the respondents supported specific renewable energy projects, recognising their potential benefits for energy security and sustainability (Komendantova, 2021). However, despite the generally positive attitude toward renewable energy, there are still concerns about the economic implications. Moroccan respondents often prioritise economic factors when evaluating energy transformation projects (Komendantova, 2021). Issues such as the cost of the energy transition and its potential to create local economic opportunities are key. Many people evaluate renewable energy projects based on how they will affect local job creation and economic stability and, therefore, prefer tangible economic benefits to abstract environmental benefits. Unlike Lithuania, surveys of Moroccan households indicate a lack of active participation in the installation of renewable energy systems, with their role largely limited to benefiting from existing

renewable energy infrastructure. Morocco's energy policy primarily influences this limited engagement, which precedes the development of large-scale renewable energy projects over smaller, community-driven initiatives.

Second, the acceptance and support of renewable energy in Morocco also depend on the accessibility of information and participation in decision-making processes. The survey results note that many Moroccans feel inadequately informed about local renewable energy projects, with more than 40% of the survey participants reporting a lack of awareness about the specifics of these projects (Komendantova, 2021). The government has implemented laws and regulations to reduce energy consumption and increase efficiency. In addition, energy efficiency promotion campaigns show ways to reduce energy consumption and improve energy efficiency. Since 2008, the Kingdom has conducted public energy awareness campaigns on national television channels.

Additionally, municipalities have disseminated guidelines to assist citizens in enhancing their energy efficiency (Hafdaoui et al., 2023). The objective is to modify household energy consumption through behaviour change, specifically by promoting energy savings and efficiency, while considering the regional economy, terrain and climate. Despite these efforts, researchers have stated that challenges remain in enhancing efficient energy use (Hafdaoui et al., 2023; El Iysaouy et al., 2023). The information gap suggests that, while there is an underlying support for renewable energy, a better-informed public might engage more actively in the transition process. Improving communication about the benefits and operations of renewable energy projects could help bridge this gap and increase public support for renewable energy projects.

Third, urbanisation primarily influences households' energy behaviour in Morocco. Research shows that urban households in Morocco tend to consume more energy due to better access to electricity and modern appliances (Haouraji et al., 2020). Meanwhile, rural households mainly use traditional energy sources for cooking and heating, such as biomass, which consists of wood and other organic materials. While urban households benefit from a larger energy infrastructure that allows for more intensive and diversified energy use, rural households face access restrictions and continue to rely on biomass energy. This disparity in energy use between urban and rural households has implications for future energy consumption trends. With increasing GDP and urbanisation, Moroccan residential energy demand is projected to increase by 70% by 2030, with electricity as the final energy experiencing the highest increase (Haouraji et al., 2020). Following this pattern, economic growth and urbanisation will lead to increased energy consumption despite a growing awareness of the need for energy efficiency and sustainable practices.

To sum up, Moroccans are well aware of the role of renewable energy in mitigating climate change and are generally supportive of related projects; several factors influence their attitudes toward energy transformation. Economic considerations, such as the impact on local job creation and costs, often precede environmental concerns. Furthermore, the level of public participation and the availability of information are significant, as many Moroccans feel that they are not sufficiently informed about specific projects. The differences between urban and rural energy consumption and rapid urbanisation and economic growth pose challenges to sustainable energy use. Addressing these challenges through targeted communication and supportive policies is the key to encouraging more active and informed participation of households in the transition to renewable energy.

Conclusions

This study provides insight into how household energy behaviour contributes to the transition to renewable energy in Lithuania and Morocco, highlighting similarities and differences due to different economic, cultural and political contexts. In Lithuania, household energy behaviour has changed significantly due to government policies promoting small-scale renewable energy generation, such as residential solar energy systems. As a result, households have become more involved in producing renewable energy and are more energy efficient. Lithuania's focus on energy independence and sustainability is reflected in households' positive uptake of

renewable technologies, although barriers such as financial constraints remain. In contrast, Morocco has large-scale renewable energy projects, such as the Noor solar project, and households play a more passive role in the transition process. There is widespread public support for renewable energy. They are troubled by limited awareness of how to support national or local renewable energy projects more actively. The Moroccan government has implemented several initiatives to promote energy efficiency and address this. However, more must be done to increase public awareness and participation, especially in rural areas where traditional energy sources dominate.

The comparative analysis between the two countries highlights the vital role of tailored policies and interventions in shaping household energy behaviour. While both countries are committed to sustainable energy change, their strategies differ in scale and focus, reflecting their unique socioeconomic circumstances. Effective communication, economic incentives, and targeted policies can stimulate energy-saving behaviour in both countries and contribute to global climate goals.

The study had a limitation: it relied on secondary data sources. The renewable energy market is changing rapidly, as are people's attitudes and preferences towards using renewable energy. This dynamic nature means that the data used may not fully reflect new trends or changes in consumer behaviour after the data collection period. Furthermore, the rapid technological progress in both Lithuania and Morocco can significantly change household energy consumption behaviour. Future studies should consider incorporating longitudinal data and real-time analysis to understand how these changes affect households' adoption of renewable energy technologies and practices.

Future research could focus on a more in-depth study of the long-term impact of these households' energy-saving behaviour on national energy resilience and sustainability. In general, the study highlights that achieving the energy transition goals will require technological solutions and a deeper engagement with the social aspects of energy consumption.

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MARKET SYSTEM DEVELOPMENT (MSD) FOR POVERTY ALLEVIATION STRATEGIES AND SOCIETAL IMPLICATIONS: A CONCEPTUAL AND BIBLIOMETRIC ANALYSES*

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Abstract. Market System Development (MSD) is an approach to economic development and poverty alleviation, focusing on making market systems more inclusive and efficient for marginalised populations. Through a conceptual and bibliometric analysis, this review explores various facets of MSD, such as integrating push and pull strategies, leveraging technology for market information dissemination, and assessing the impacts of microfinance and private sector development on market inclusivity. Using bibliometric analysis with the Biblioshiny Package for RStudio, we examined 46 articles sourced from Scopus. Our findings highlight the importance of context-specific interventions and a deep understanding of local market dynamics. Notable examples include strategies for enhancing women's economic empowerment and the application of the Progress out of Poverty Index (PPI) for precise targeting in poverty alleviation programs. The roles of mobile enterprises and periodic markets in rural Kenya and the potential of ICT in improving agricultural market information access illustrate the diverse applications of MSD. This review underscores the need for resilient and equitable market systems to ensure inclusive economic growth, providing valuable insights for policymakers, practitioners, and researchers dedicated to sustainable and secure regional development that uses market conditions through efficient continuous market development.

Keywords: market system development; poverty alleviation; regional development

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JEL Classifications: R11

1. Introduction

The market economy's basic understanding is as a type of economic system where decisions about investment, production, and distribution to consumers which are directed by price signals resulting from the forces of supply and demand, should be adapted to tackle local barriers and social inequalities. External forces such as climate change are leading to a weakened global market and economy, as observed with the energy wars, that affect the poorest communities and regions that, however, require market opportunities and economic access to be active members of society who can self-sustain. However, a non-inclusive market leads to marginalised people, as

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women in several countries cannot negotiate pervasive social, legal, and cultural barriers, reducing their participation in the productive sphere or market systems, as producers and entrepreneurs (Faveri et al., 2015). The integration of push and pull strategies to enhance women's economic empowerment demonstrates how targeted interventions could create significant economic and social benefits.

Market System Development (MSD) is an approach aimed at fostering sustainable and inclusive economic growth by transforming market systems to function more effectively for poor and marginalised communities. Unlike traditional development models that often rely on direct aid or isolated interventions, MSD focuses on understanding and addressing the systemic barriers that prevent markets from being inclusive and efficient. This approach seeks to improve market systems for the poor by targeting the root causes of market dysfunctions and promoting changes that benefit all participants, particularly marginalised groups (Faveri et al., 2015).

The concept of the market(s) is relevant in terms of social inclusion and the inclusion of human and product capital. It was already in 1997 that Griffin and Ickowitz mentioned the importance of natural capital in the total stock of capital tends to vary inversely with the level of income per head. That is, the poorer the country, the more significant natural capital is likely to be in determining the overall distribution of wealth. (Ickowitz, 2000). Thus, we should also consider that the economies of developing countries have to tackle diverse challenges than developed ones (Anderson et al., 2006).

An example includes the Katalyst project, where the use of the Progress out of Poverty Index (PPI) illustrates how precise targeting and measurement tools improve the effectiveness of poverty alleviation programs. The role of mobile enterprises and periodic markets in rural Kenya, as well as the potential of ICT in improving agricultural market information access, further underscore the diverse applications and impacts of MSD. These studies collectively emphasise the importance of creating market systems that are efficient and inclusive, ensuring that the benefits of economic growth reach the most vulnerable populations.

To present an overview of how the scholarly research has tackled this topic so far, considering this crucial value for societal inclusion, the paper presents the current literature on this pressing topic by carrying out a bibliometric analysis and, subsequently, a manual selection of specific issues of relevance to provide a comprehensive examination of how market systems could be developed and leveraged to benefit those with lower market accessibility. These highlight the importance of context-specific interventions and the need for a deep understanding of local market dynamics.

2. Approaching the Concept of Market System Development

The economic theory of modern capitalism can be viewed as a complex system of interdependent categories, such as price, capital, wages, interest, and rent, defining and influencing each other. If one element is removed, the entire system falls apart, as each category loses its distinct meaning and can no longer be quantified (Kramar, 2018). Therefore, considering (market) accessibility and societal innovation, it is crucial to study measures where this market system development creates environments conducive to dynamic and equitable economic activity. It should be acknowledged that the former theory is criticized arguing that it is the current perception and behaviour of production and consumption that has led to a market that leaves out those who require this same market to be just the most.

MSD is built on the principle that market systems are complex networks of actors, rules, and norms that dictate how goods, services, and labour are exchanged. To make these systems more inclusive, MSD aims to identify and address constraints that hinder the participation of marginalised groups, such as smallholder farmers, women, and the poor. This often involves facilitating changes in market behaviours and relationships, improving access to information, enhancing skills, and promoting more supportive regulatory environments (Anderson et al., 2006).

A key feature of MSD is its focus on systemic change rather than temporary solutions. This involves engaging with various stakeholders, including private sector actors, governments, and civil society organisations, to create lasting improvements in market systems. By doing so, MSD aims to establish market conditions that allow for broader and more equitable participation, enabling marginalised groups to improve their livelihoods sustainably (Bekkers et al., 2008).

Technological innovation is also a crucial component of MSD, as it can significantly enhance access to market information and improve connectivity among market participants. For instance, leveraging Information and Communication Technology (ICT) can empower smallholder farmers by providing timely and relevant market information, which helps them make informed decisions about production and sales, ultimately increasing their incomes and resilience (Magesa et al., 2015).

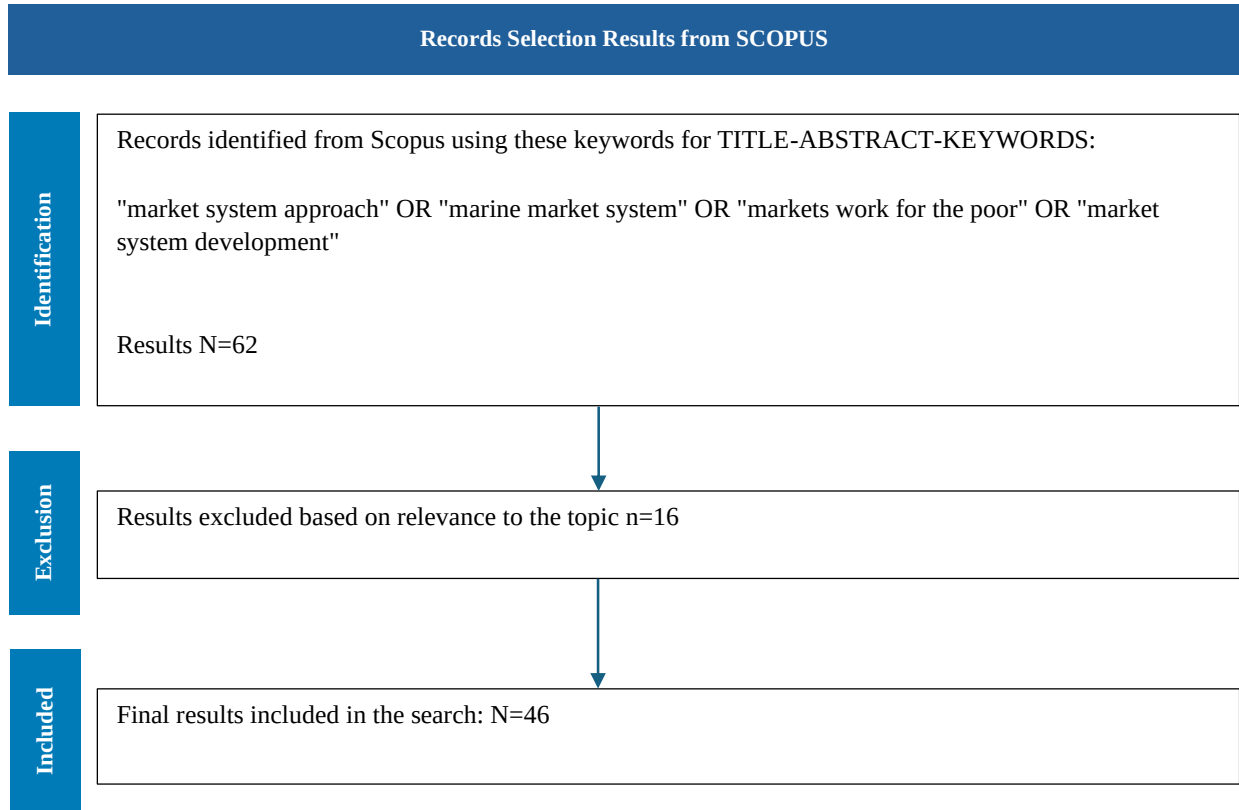
Furthermore, MSD often employs a "push-pull" strategy to facilitate market participation. "Push" strategies are designed to build the capacities of marginalised groups by providing skills training or access to financial services, helping them enter and compete in markets. On the other hand, "pull" strategies aim to enhance demand by making markets more accessible and attractive for these groups, often through regulatory reforms or improvements in market infrastructure (Faveri et al., 2015).

MSD focuses on creating more inclusive and resilient markets by addressing systemic barriers that prevent equitable participation. By fostering sustainable changes that benefit all market actors, primarily the marginalised, MSD could provide a robust framework for sustainable economic development and poverty alleviation. This approach underscores the importance of systemic improvements, technological innovation, and capacity building in achieving inclusive and just economic growth. The next section presents the bibliometric methodology and results, followed by discussion and concluding sections.

3. Methodology

Considering the topic's relevance, as presented in the first section of this paper, it is necessary to highlight the gaps in scholarly literature to identify the societal implications and future research requirements. To carry out this analysis, we searched on Scopus using selected keywords (carried out on 18 July, 2024) and the results (N=46) were analysed using bibliometric instruments employed through the Biblioshiny Package for RStudio (Aria & Cuccurullo, 2017). The next section deploys a more conceptual analysis of selected papers.

The keywords "market system approach" OR "marine market system" OR "markets work for the poor" OR "market system development" limited to final articles resulted in 46 items (Figure 1).

**Figure 1.** PRIMA flow diagram

Source: own production based on Page et al. (2022) illustrating the inclusion and exclusion criteria employed in this study

4. Bibliometric Results

The results highlight that scientific production on this topic varies, providing one paper published in 1980 from 2004 with no connection between the two (Figure 2). The first paper from 1980 debates how the periodic market system is (or was) primarily from West Africa and the historical progression of the market system from the colonial era's dominance by expatriates to an indigenous, African-controlled system, the ongoing growth rather than the eradication of small, mobile, part-time vendors, and their limited mobility seem to contradict key elements of the majority of current economic models (Freeman, 1980). The latest paper published in 2023 looked specifically at China and suggested that the government implement property right reform to generate effective incentives, advance factor price market reform, foster institutional innovation that is consistent with the high-standard market system, maintain market security and improve the mechanisms that support the high-standard market system (Baoping, 2023).

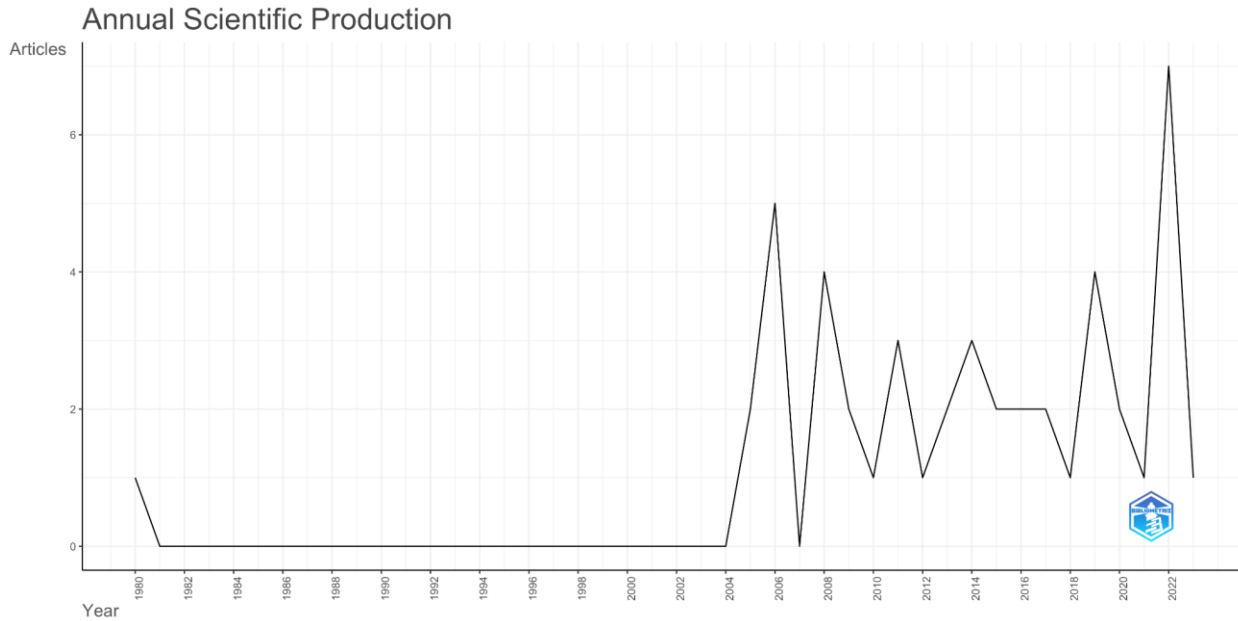


Figure 2. Annual Scientific Production (count Articles per year)
Source: own production using Biblioshiny

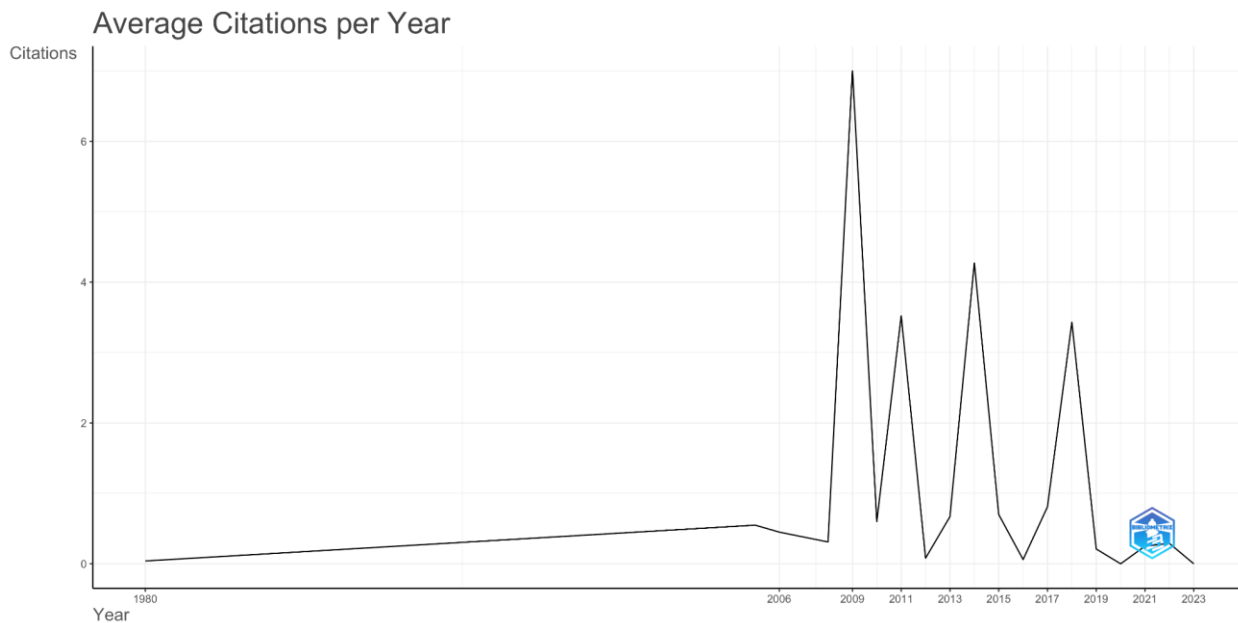


Figure 3. Average Citations per Year (count average per year)
Source: own production using Biblioshiny

The average number of citations per year peaked in 2009 with two main papers on farmers' market access (Hellin et al., 2009) - also the most cited (Figure 6) - and a paper presenting the concept of Making Markets Work for Poor (MMW4P) seen as an approach to poverty reduction in developing countries that focuses on the role of business in improving the lives of the poor, acknowledging market limitations (Poole, 2009).

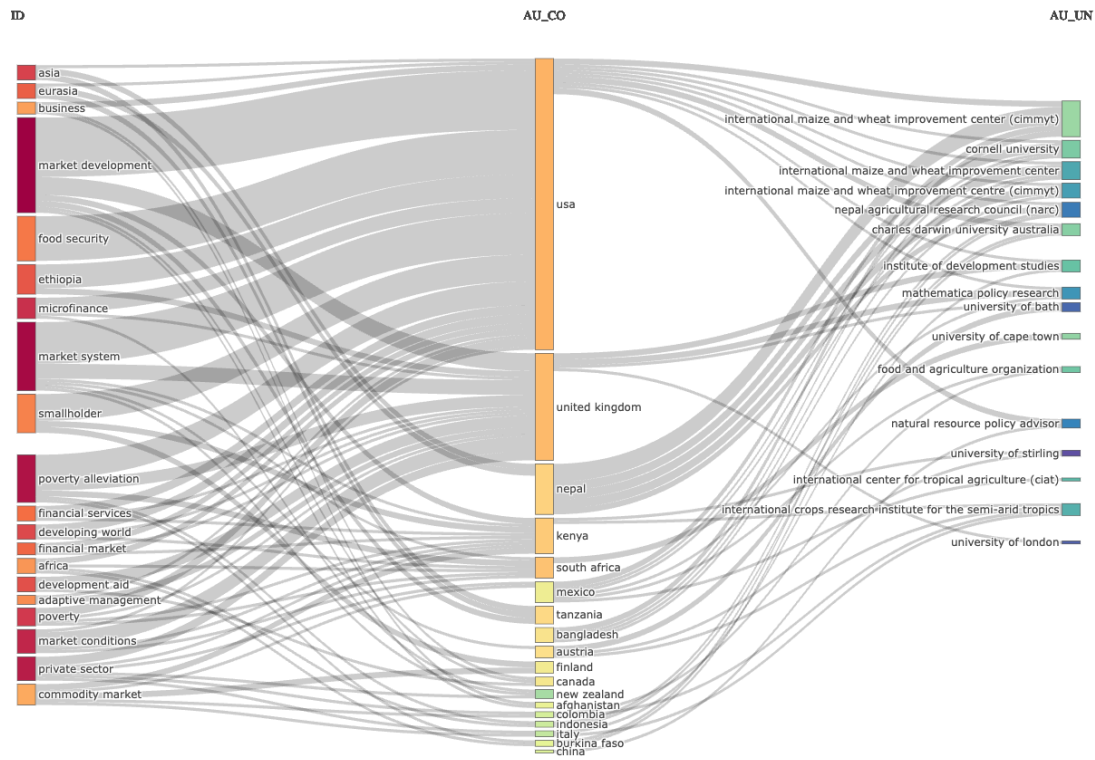


Figure 4. Three-Field Plot with KeyWord Plus (left), country (middle), and Affiliations (right)

Source: own production using Biblioshiny

The Three-Field Plot (Figure 3) not only points out that research derives from the same locations (USA and Britain) while researching topics are related to countries outside of these same (also observed by motor themes in Figure 8), such as those in continent Asia focusing on microfinance, food security, and poverty alleviation as highlighted by the keywords. KeyWords Plus enhances the power of cited-reference searching by searching across disciplines for all the articles that have cited references in common. For Scopus data, KeyWords Plus is calculated by analysing the reference lists of the documents in the dataset and identifying frequently recurring words and terms from the titles of the articles cited by your documents (Aria & Cuccurullo, 2017).

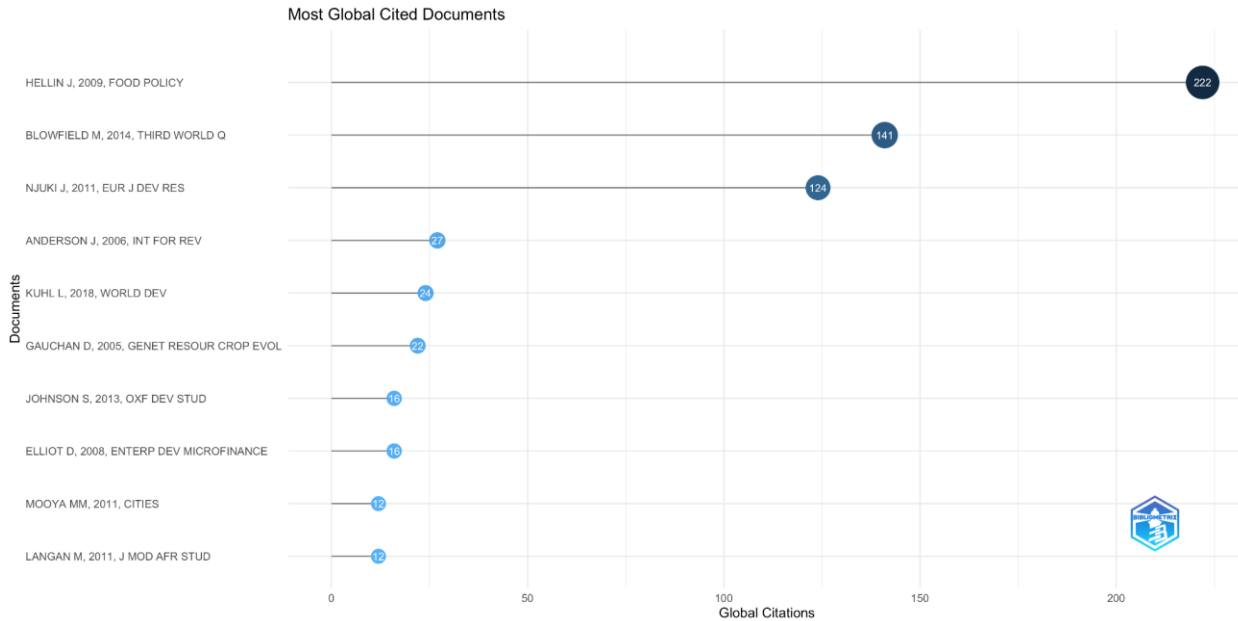


Figure 5. Most Global Cited Documents (per Global Citations per Documents)

Source: own production using Biblioshiny

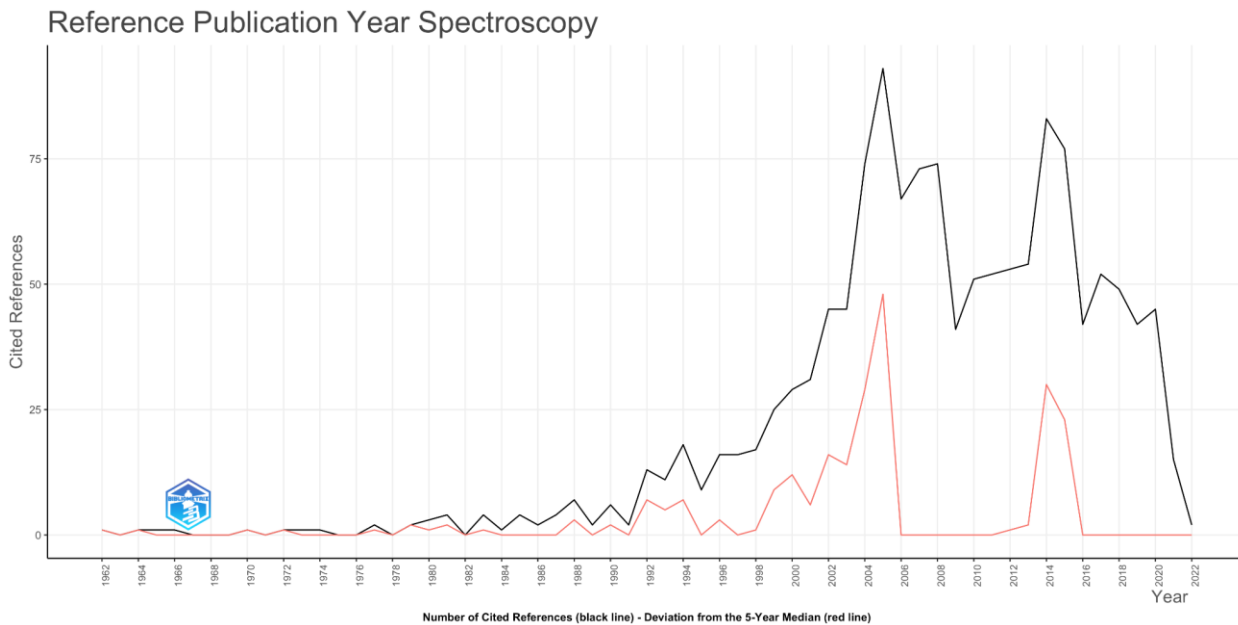


Figure 6. Number of Cited References (black line) per deviation from the 5-year Median (red line)

Source: own production using Biblioshiny

The reference publication year spectroscopy (RPYS) is a bibliometric method which can be used to analyse the historical origins of research fields or researchers. This method analyses the cited references (CR) and especially the referenced publication years of a publication set. For this particular analysis it identifies historical peaks in 2005 and 2015 indicating that a large number of recent papers in the field have cited papers from these years. Articles published in these years include specifically on market-based incentives for farmers (Gauchan et al., 2005), making market assessment more useful (Miehlbradt, 2005), agricultural market information (Magesa et al., 2015), and making markets work for females (Faveri et al., 2015). It could be assumed that as MSD debates that market inclusion should be built on a self-sustained system (e.g., local communities should not rely on external more economically stronger powers to survive) then agriculture, obviously necessary to combat famine, requires attention to how farmers, whether women or men, adapt to the market changes and crises. Furthermore, how women, being considered potentially needed for child-bearing, may be key, if allowed and trained, to become farmers and contribute to the market.

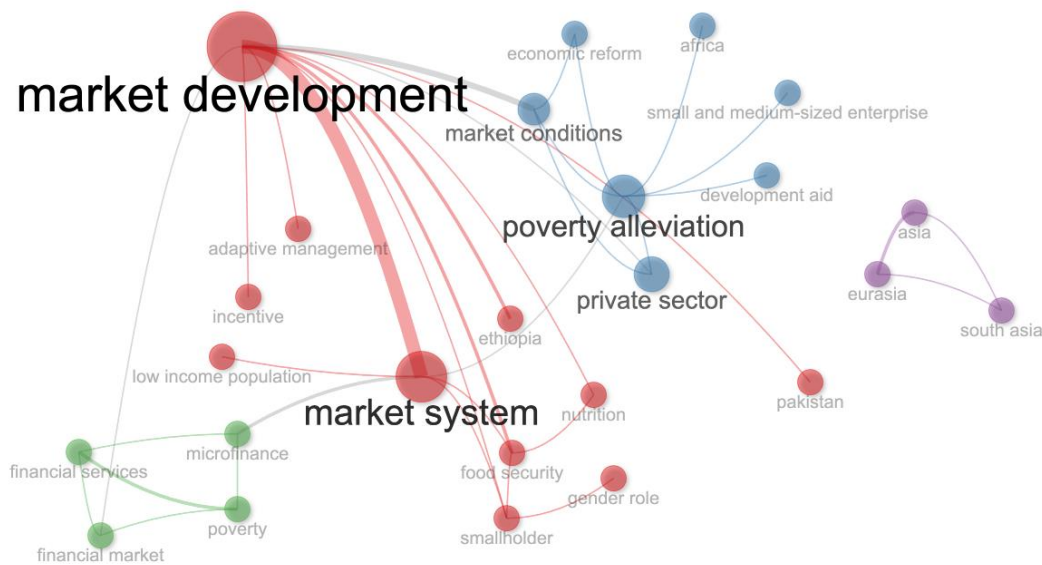


Figure 7. KeyWords Plus Word Chart per theme(s) (divided by colour)

Source: own production using Biblioshiny

The gender factor appears in the literature when observing the KeyWords Plus (Figure 7); however, it is not observed as a motor theme (Figure 8), suggesting the need for more attention. This remains true for the themes of market development and market conditions; while they are both relevant, only market conditions (intending demands to tackle poverty alleviation) are developed. However, this should be carried out for market development, referring to the process of expanding a market or creating new market opportunities that are needed within market conditions and do not remain constant.

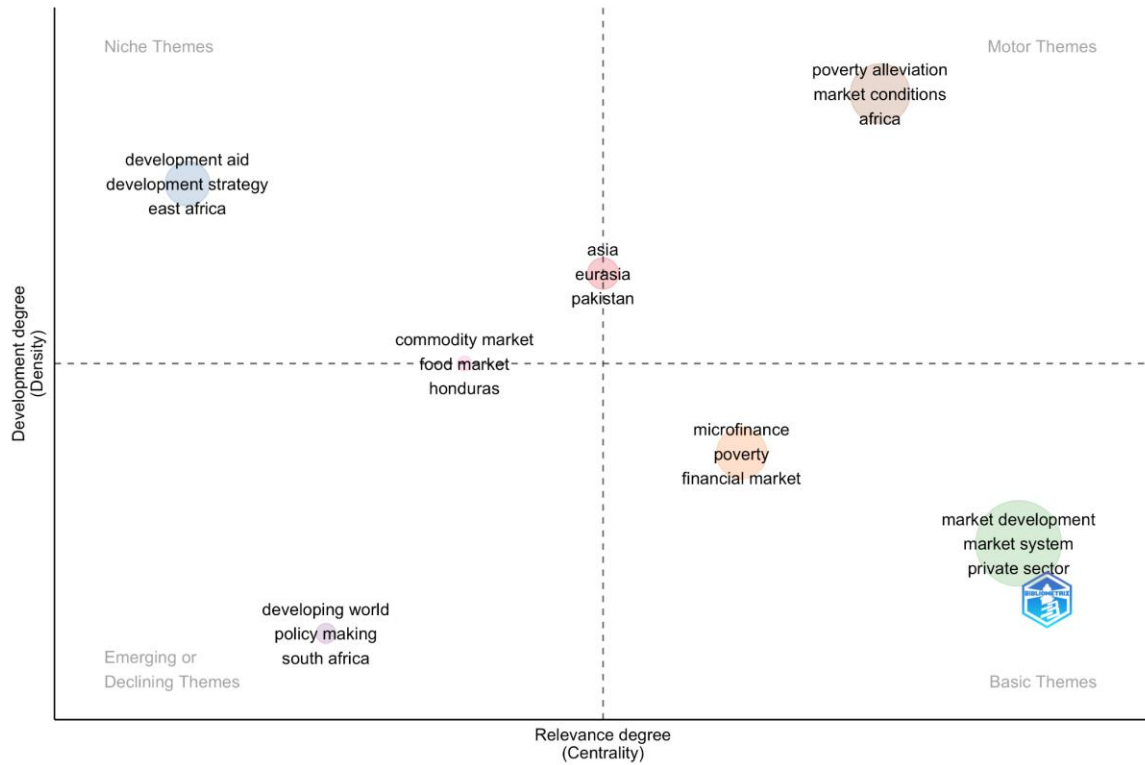


Figure 8. Motor Themes (top right) by KeyWords Plus
Source: own production using Biblioshiny

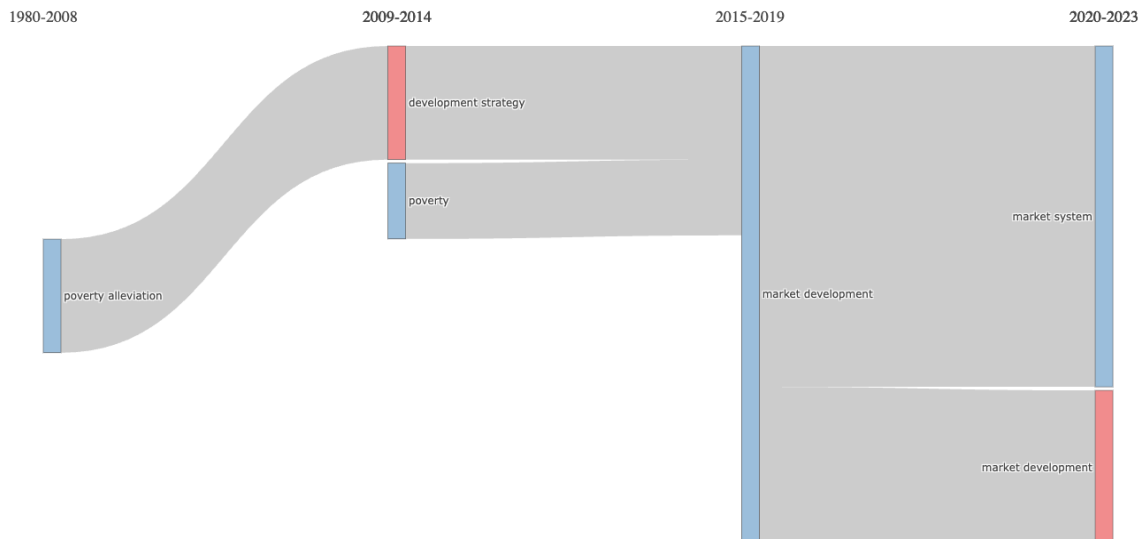


Figure 9. Theme Evolution by KeyWords Plus (1980-2024)
Source: own production using Biblioshiny

All the figures (7-9) above highlight the direction and interest of MSD in achieving poverty alleviation. Additionally, in Figure (8), we identify that the main key terms have indeed evolved where the stream appears to be that research that started for poverty alleviation rather moved to highlight that for development, you require an understanding of the market development.

For the next subsections, we identify key papers selected manually for their focus on poverty alleviation and examples of how MSD has achieved such an objective.

4.1. Women's Economic Empowerment through Push and Pull Strategies (Faveri et al., 2015)

Faveri et al (2015)'s paper highlights the integration of push and pull strategies to enhance women's economic empowerment across different contexts, including Ghana, Pakistan, and Afghanistan. Push strategies focus on equipping women with the necessary skills, confidence, and assets to engage in markets. In contrast, pull strategies leverage market incentives to ensure sustained economic participation. The case studies demonstrate that combining these strategies significantly improves women's income, business sustainability, and social status. The findings emphasise the importance of context-specific interventions and the role of social and cultural factors in shaping economic opportunities for women.

4.2. Mobile Enterprises and Rural Markets in Kenya (Freeman, 1980)

Donald B. Freeman's study examines the patterns of mobile enterprise activities and rural market dynamics in Central Province, Kenya. The research critiques existing theoretical models of trader mobility and periodic market structures, highlighting the unique aspects of East African markets. Through a survey of 852 non-farm enterprises, the study provides an alternative explanation of market participant behaviour based on empirical data. The findings challenge traditional models and offer new perspectives on rural economic activities, contributing to a deeper understanding of market dynamics in sub-Saharan Africa.

4.3. Assessing Pro-Pooriness with the Progress out of Poverty Index (PPI) (Jalil & Azam, 2014)

Jalil and Azam (2014)'s paper discusses the use of the PPI to evaluate the poverty impact of the Katalyst project in Bangladesh, an M4P (Making Markets Work for the Poor) initiative. The PPI, a tool developed by the Grameen Foundation, helps measure the poverty profile of beneficiaries accurately and efficiently. The study showcases how PPI has been instrumental in both internal project management and external reporting, ensuring that interventions effectively target poor populations. The paper provides practical insights into the benefits and challenges of using PPI in poverty assessment.

4.4 Framework for Accessing Agricultural Market Information (Magesa et al., 2015)

Magesa et al. (2015)'s study presents a framework for improving smallholder farmers' access to agricultural market information through ICT (Information and Communication Technology). The framework aims to enhance farmers' market participation and income by providing timely and accurate market data. Case studies demonstrate the potential benefits of ICT interventions in bridging information gaps and empowering farmers. The research emphasises the strategic role of technology in transforming agricultural markets and improving smallholder farmers' livelihoods.

4.5 Private Sector Development and Microfinance (Tanburn, 2006)

This paper explores the role of private sector development and microfinance in promoting economic growth and reducing poverty. It examines various microfinance models and their effectiveness in fostering entrepreneurship

and financial inclusion. The study provides a comprehensive analysis of microfinance as a development tool, highlighting successful models and potential challenges. It contributes to the broader discourse on financial inclusion and the role of microfinance in sustainable economic development.

5. Discussion

As the above analysis highlights there are various ways in which MSD is implemented, but for different reasons. Therefore, it is crucial to provide an overview of the efficient implementation of the same.

The integration of push and pull strategies provides a practical framework for designing women's economic empowerment programs, adaptable to various cultural and economic contexts. The use of PPI in project assessment offers a robust tool for accurately targeting and measuring poverty impacts, enhancing the effectiveness and accountability of development projects. The framework for accessing agricultural market information through ICT highlights the transformative potential of technology in improving market access and decision-making for smallholder farmers. Freeman's study on mobile enterprises in Kenya challenges existing theoretical models, offering new perspectives on rural market dynamics and trader mobility.

The analysis of microfinance models provides valuable insights into optimising financial inclusion initiatives for sustainable economic growth that require market development to be more included in the implementation of market conditions, as previously expressed. The emphasis on understanding local conditions and cultural factors in designing interventions ensures that development strategies are relevant and effective in diverse contexts. It is acknowledged that this means that MSD should be structured case-by-case; however, future research should also consider replicability factors.

Microfinance and private sector development are critical components of MSD. The role of microfinance in promoting financial inclusion and economic growth is well-documented, with various models offering valuable insights into optimising these initiatives for sustainable development. This underscores the importance of financial tools in fostering entrepreneurship and reducing poverty. Other examples of this point include studies on complementary currencies ideally portrayed as social innovation tools able to enhance the resilience of local communities, increasing the level of economic activity, trust, and cooperation among its users, promoting citizens' participation in the management of social and economic affairs in the territory (Fare et al. 2017).

Technological innovations play a significant role in MSD, particularly through the use of ICT to disseminate information about the agricultural market. By bridging information gaps, technology can substantially boost market participation and income for smallholder farmers, demonstrating the strategic importance of ICT in transforming agricultural markets and livelihoods.

Empirical and theoretical contributions from studies like Freeman's work on mobile enterprises in Kenya challenge existing models and provide new perspectives on rural market dynamics. These insights are crucial for developing more accurate and effective market interventions, contributing to a deeper understanding of economic activities in sub-Saharan Africa and beyond.

Measurement and evaluation tools, such as the PPI are highlighted for their effectiveness in assessing the poverty impact of development projects. These tools enable precise targeting and evaluation, enhancing the accountability and effectiveness of interventions aimed at poverty alleviation. Furthermore, integrating market systems with climate resilience strategies presents both opportunities and challenges. Effective program design, as seen in the Feed the Future program, is essential to manage trade-offs and enhance technical capacities, thereby maximising the impact of agricultural development in the face of climate change.

Inclusive financial markets require addressing underlying social structures and regulatory frameworks. The shift towards making financial markets more inclusive necessitates understanding and tackling relational aspects of poverty, as these social institutions significantly influence market participation and economic outcomes. Addressing these aspects is crucial for truly inclusive economic development.

In the educational sector, systemic approaches to reform, such as the DEEPEN project in Lagos, Nigeria, demonstrate the potential for achieving sustainable impacts. Prioritising long-term outcomes over short-term gains is essential for meaningful improvements in education, suggesting a need for fundamental changes in aid strategies to enhance educational systems effectively.

The case studies presented above share the importance of context-specific approaches in achieving meaningful and sustainable impacts on marginalised populations. These contribute to a deeper understanding of economic development challenges and offer actionable solutions to enhance market efficiency, empower marginalised groups, and reduce poverty. Thus, provide a valuable resource for development practitioners, policymakers, and researchers seeking to implement effective and sustainable development programs.

5.1 Farmer's Organisations as a pro-poor growth strategy in Meso-America (Hellin et al., 2009; Kuhl, 2018)

As shown by case studies in Meso-America conducted by Hellin et al. (2009), smallholder farmers face challenges in the evolving global agricultural economy, such as meeting market standards and providing consistent products. Supermarkets' demand for vertical coordination exacerbates these difficulties. In Honduras and El Salvador, farmer organisations enhance market access in the high-value vegetable sector, which has high transaction costs. For undifferentiated commodities like maize in Mexico, the incentive to organise is lower, but these organisations still help by providing access to agricultural inputs.

Farmer organisations in El Salvador and Honduras need subsidies due to low margins. Still, they demonstrate that such organisations can effectively promote pro-poor growth and make markets work for the poor. In La Frailesca, Mexico, they facilitate access to inputs. Farmers need to add value or differentiate their products to move out of poverty, making farmer organisations a dynamic solution for pro-poor growth.
Market system development to build climate resilience

Kuhl (2018) examines the interplay between market systems and climate resilience approaches in agricultural development, focusing on the Feed the Future program in Ethiopia and Honduras. While market systems interventions offer potential benefits for climate resilience, they also face significant challenges due to conflicting objectives and methodologies. Effective integration requires careful program design, including strategies to address trade-offs and enhance technical capacities. The findings underscore the importance of managing tensions between these approaches to maximise their impact on agricultural development in the face of climate change.

5.2 Inclusive Financial Markets (Johnson, 2013)

Johnson (2013) discusses a shift in microfinance policy from focusing on building financial institutions for the poor towards an inclusive agenda termed *Making Markets Work for the Poor*. While this approach aims to address social exclusion, it appears to be adopting a *residualist* (e.g., lack of resources) view of poverty, overlooking the relational aspects of this approach and missing the deeper causes of poverty that are related to social structures and relationships, such as gender roles, power dynamics, and social norms. The author argues that understanding poverty requires recognising social institutions' influence as regulatory structures. Using gender relations as an example, the author illustrates how this disjuncture can be addressed.

This article identifies a gap between the discourse of inclusive financial markets and its analysis, stressing the need to examine how markets perpetuate poverty through relational processes. It suggests integrating the concept of social regulation, which emphasises the role of social institutions in structuring market exchange. Policy interventions should move beyond regulatory measures to empower marginalised groups and address underlying social structures that hinder equitable participation in financial markets. Ultimately, advocating for broader rights and addressing social regulatory structures are essential for promoting inclusive financial market development.

5.3 MSD in education: the case study of DEEPEN in Lagos, Nigeria (Taylor et al., 2017)

Taylor et al. (2017) highlight the persistent challenges in global education despite decades of aid investment. Conventional aid approaches have had limited success in improving educational outcomes, often only providing a small supplement to broken systems. The paper introduces a framework to analyse aid program motivations and assesses different education approaches against key metrics. It proposes an alternative approach that fundamentally changes education systems to achieve sustainable impact. The case of DEEPEN in Lagos, Nigeria, demonstrates the potential of a systemic approach, although the results are preliminary. The paper emphasises the need for a reprioritisation of metrics, prioritising scale and long-term impact over short-term gains. Transparency about these priorities is crucial for improving educational outcomes in developing countries.

5.4 How to assess if markets work better for the poor? Evidence from Katalyst project in Bangladesh (Bekkers et al., 2008)

Bekkers et al. (2008) explore the need for reports on private sector development project results and poverty impacts, particularly focusing on Katalyst, an M4P project in Bangladesh. Katalyst implemented an internal monitoring system for impact assessment, aiding in selecting interventions with the greatest poverty reduction potential and enhancing reporting by projecting future impact and providing qualitative examples. Despite requiring resources and staff involvement, Katalyst managers find the investment worthwhile for its positive impact on project effectiveness.

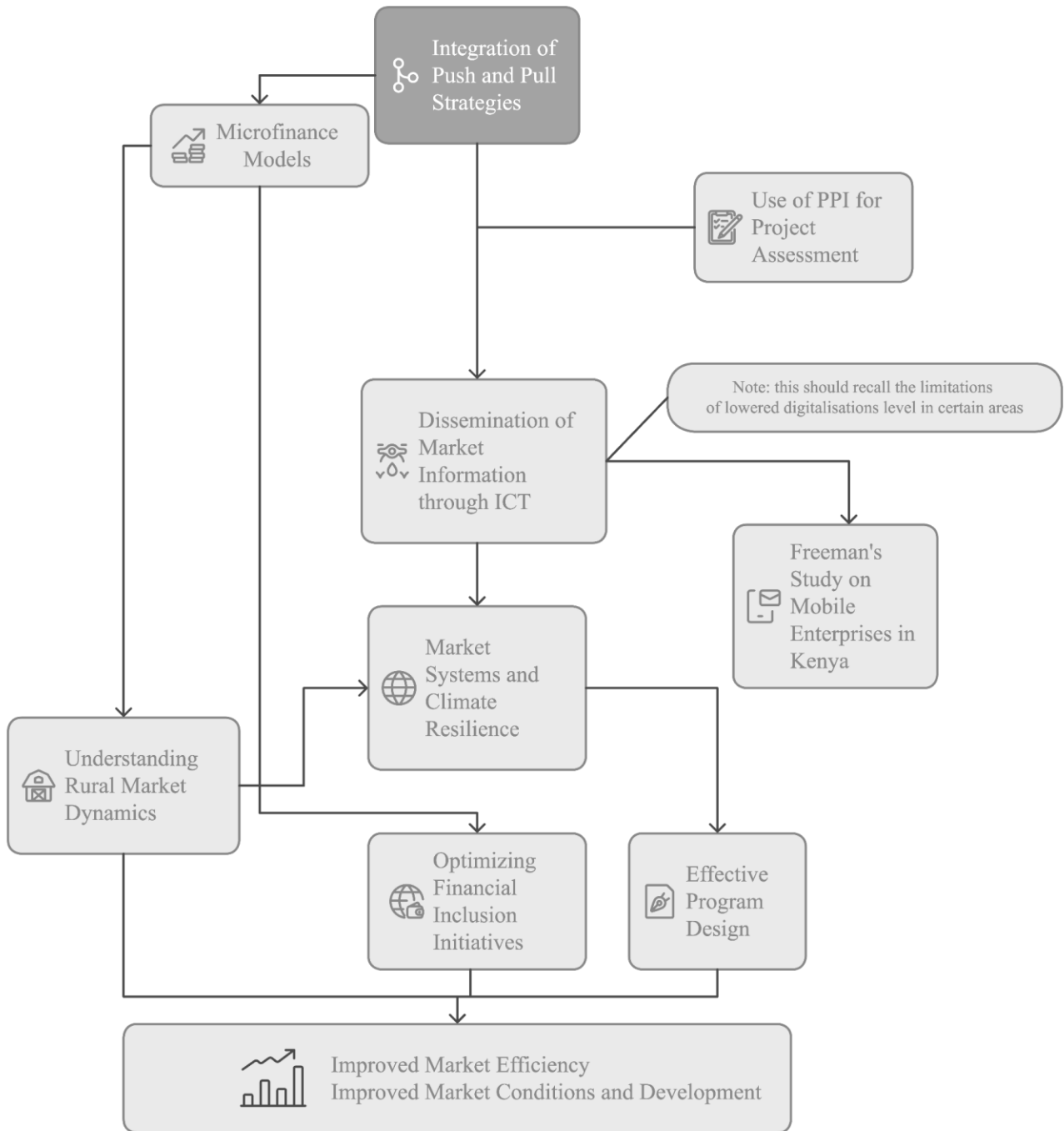


Figure 10 Summary Concepts

Source: Own production

Figure 10 aims to summarise the successful elements derived from the literature above that could support the efficient development and implementation of MSD.

Conclusions

The literature on MSD reveals its substantial impact on economic development and poverty alleviation by fostering more inclusive and efficient market systems. Tailoring interventions to local contexts and integrating technological innovations are key to empowering marginalised populations, such as women and smallholder farmers. Empirical studies challenge existing economic models, offering fresh perspectives on market dynamics, particularly in rural and developing regions. The role of microfinance and private sector development in promoting financial inclusion and entrepreneurship is well-established, highlighting the need for robust measurement tools like the PPI to ensure effective targeting and accountability. Moreover, the integration of MSD with climate resilience and inclusive financial markets underscores the importance of addressing underlying social and regulatory structures to achieve sustainable economic growth. In the education sector, systemic reforms demonstrate the potential for lasting improvements, emphasising the necessity for long-term impact over immediate gains.

These insights and strategies collectively offer a comprehensive roadmap for policymakers, development practitioners, and researchers to enhance market efficiency, empower marginalised communities, and reduce poverty sustainably through MSD. Further literature can lead to the question of the relationship between market systems, capital, and other underlying topics such as poverty management, national development, and local issues and circumstances, without forgetting about lower levels of digitalisation, currency limitations, and other similar factors.

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THE IMPACT OF POVERTY, INEQUALITY AND UNEMPLOYMENT ON YOUTH: A CASE STUDY OF NQABANE, SOUTH AFRICA

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Abstract. The triad of poverty, inequality, and unemployment has a detrimental effect on the lives of South African youth. A complex web is formed by the interaction of each of these elements, which not only restricts opportunities but also exacerbates the psychosocial issues of young people. A comprehension of the implications of this triad is necessary to address the distinctive requirements of South African youth. This quantitative study used a sample of 100 youth to respond to questionnaires on the extent to which the triple challenges affect unemployed youth in Nqabane, South Africa. The study accepted the alternative hypothesis, which states that youth agri-preneurs are more affected by the triple challenges of poverty, inequality, and unemployment. These findings have far-reaching implications. They emphasise the pressing need for economic institutions and policymakers to encourage young people to pursue entrepreneurship and incorporate agriculture issues into the field.

Keywords: Youth; poverty; inequality; unemployment; agri-preneurship

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JEL Classifications: J1, L26

1. Introduction

The powerful triad of poverty, inequality, and unemployment negatively impacts the lives of South African youth. Each of these elements interacts with the others to form a complex web that not only limits opportunities but also makes young people's psychosocial problems worse. Addressing the unique needs of South African youth requires an understanding of the ramifications of this triad. Even though South Africa has one of the biggest economies on the African continent, poverty is a widespread problem that affects millions of people. Precarious employment conditions contribute to the overall poverty landscape, as evidenced by the many employed people who remain impoverished (Makhalima, 2023). The gender wage gap impacts women since they typically make much less than men and work in lower-paying positions (Makhalima, 2023). The Ministry of Social Development acknowledges that a large percentage of the population lives below the poverty line due to the highly unequal income distribution, which traps young people in a cycle of disadvantage (Zibengwa & Tanga, 2023). Cross-sectional studies that emphasise the impact of poverty on mental health in South Africa show that this widespread poverty has negative psychological effects, including higher rates of depressive symptoms among youth (Zimmerman et al., 2022). This problem is exacerbated by differences in access to resources, which make it harder for young people living in poverty to break free.

Unemployment, which continues to be one of South Africa's most pressing problems, is closely related to poverty. South Africa has one of the world's highest rates of youth unemployment. Youth unemployment has been shown to have negative effects on social cohesion, increased distress, lower self-esteem, and the likelihood of social unrest, in addition to economic repercussions (Musariwa & Tinonetsana, 2023). These circumstances were greatly worsened by the COVID-19 pandemic, which led to millions of young people losing their jobs and their means of subsistence (Brown et al., 2024). There are also worries that young people have difficulty entering the workforce because of their lack of education and real-world experience, which feeds the vicious cycle of unemployment and poverty (Marsay, 2022).

The problems caused by unemployment and poverty are exacerbated by inequality. South Africa consistently ranks among the world's most unequal societies, with young people, especially those from marginalised communities, being disproportionately impacted by income disparities (Aiseng, 2024). Wealth is concentrated in the hands of a select few due to economic inequality, and a sizable section of the youth population faces survival challenges. This disparity affects their access to education and work prospects, resulting in a setting where socioeconomic mobility is hindered from an early age. Young women frequently experience both economic and gender-based disparities, which are made worse by the gender pay gap that currently exists (Makhalima, 2023).

These difficulties have significant psychological ramifications. According to Mamukeyani et al. (2023), young people who are unemployed and living in poverty are more likely to experience mental health problems like anxiety and depression, which can result in substance abuse in a variety of ways as a coping strategy. Interventions must address mental health, well-being, and economic empowerment (Madisha & Skhosana, 2022). Cultural considerations influence the conversation about depression and unemployment, highlighting the necessity of culturally aware methods in youth-focused interventions in South Africa (Odimegwu & Ugwu, 2022).

Additionally, young people from marginalised communities face difficulties and are frequently further excluded from welfare and employment opportunities. Additional forms of marginalisation are experienced by this group, which makes them more likely to engage in risky behaviours just to survive (Ramoshaba et al., 2022). These problems could be made worse by policies that disregard the demographic diversity of young people, erecting structural obstacles that keep these people from having the same access to opportunities as their peers in the community.

Despite these obstacles, government and community programs are essential for tackling youth unemployment and empowering young people. Programs that increase youth economic opportunities are crucial, particularly those that encourage entrepreneurship and skill development. To address unemployment and poverty, research emphasises the value of local government initiatives to train and assist young entrepreneurs (Ndebele et al., 2022). Communities can start to address the imbalances brought about by the triad of unemployment, inequality, and poverty by creating an atmosphere that supports youth-driven businesses.

There is a wealth of research on agri-preneurship, but little is known about how the triple challenges of unemployment, poverty, and inequality impact unemployed youth in Nqabane. This study aims to fill that knowledge gap.

2. Review of selected literature

2.1 The extent to which the triple challenges affect unemployed youth

2.1.1 Poverty

The enduring prevalence of poverty continues to be a significant socioeconomic challenge in South Africa since the democratic transition in 1994. Poverty refers to an insufficiency of essential resources necessary for sustaining

life (World Bank, 2023). Poverty is conventionally understood through the lens of income; however, as articulated by the United Nations (UN) on its website, it encompasses a broader spectrum that includes inadequate access to fundamental services such as education and healthcare, alongside issues of social exclusion, discrimination, and insufficient participation in decision-making processes (United Nations, 2022). Poverty constitutes a significant societal challenge (Prasetyo & Thomas, 2021).

In 2023, global poverty levels remain influenced by multiple factors, notably the repercussions of the COVID-19 pandemic and persistent economic challenges. In 2022, approximately 712 million individuals were classified as living in extreme poverty, indicating a notable rise from levels observed before the pandemic. The increase in extreme poverty indicates a regression in poverty alleviation efforts, especially in areas such as Sub-Saharan Africa, where poverty is most prevalent. The World Bank (2023) defines extreme poverty as subsisting on less than \$2.15 per day, equivalent to approximately R40.74 in South African Rands, using an exchange rate of 1 USD = 18.95 ZAR.

Despite international efforts to combat poverty, the goal of eradicating severe poverty by 2030 is becoming more and more unattainable given the present rate of economic expansion and the extra difficulties brought on by wars and climate change. Additionally, according to the Global Multidimensional Poverty Index (MPI), 485 million people in developing nations live in extreme poverty, which includes several deprivations in areas including health, education, and living standards, while 1.1 billion people remain in poverty (UNDP, 2023). These figures highlight the need to step up international efforts to protect the most vulnerable groups and combat poverty in all its manifestations.

Poverty in South Africa has mostly persisted as a rural issue. Zimbalist (2017 cited in Gumede, 2021) showed that poverty levels were much greater in rural regions compared to metropolitan areas throughout the period from 1997 to 2012. Since Zimbalist (2017) made this discovery, the situation has remained mostly unchanged from his findings. Poverty in rural regions has likely risen because of a declining economy, exacerbated by the COVID-19 epidemic. Despite the apparent fall in poverty, as shown by Gumede (2021), rural poverty has not significantly diminished. In the most recent NIDS wave, rural poverty was at 45 per cent, and urban poverty was at 19 per cent. Furthermore, female-headed families disproportionately experience poverty, particularly those located in rural regions. This reinforces the position of those who contend that policy actions should not overlook rural areas (Gumede, 2021).

Numerous authors (Wade, 2020; Si et al., 2021; Cumming et al., 2021; Ayoo, 2022; Sutter et al., 2023) indicate that poverty alleviation has progressively emerged as a central theme for scholars in the social sciences, encompassing economics, finance, management, and entrepreneurship. This addresses the gravity of severe poverty and the ambiguous outcomes of poverty reduction initiatives (Han et al., 2023).

Rudin (2022) believes that an increasing number of South Africans are currently experiencing unprecedented poverty. Masuku et al. (2023) claim that South Africa's advanced constitution and legislative framework unequivocally provide the legal basis for equality and non-discrimination. Nonetheless, the problem persists in fully implementing these policies to enhance the living standards of historically marginalised groups, particularly youth, women, and children.

Agri-preneurship, which integrates agriculture with entrepreneurship, significantly contributes to reducing poverty by generating employment possibilities, particularly in rural areas where poverty is often more prevalent. It motivates people to generate sustainable income from their enterprises, enabling them to meet fundamental needs, invest in education, and enhance their quality of life. Agri-preneurs might enhance their output by acquiring new agricultural methodologies and participating in market-oriented initiatives. Moreover, agri-preneurship catalyses rural development by strengthening economic growth and upgrading infrastructure, thus

creating a more favourable climate for poverty reduction. Agri-preneurship effectively alleviates poverty by generating sustainable livelihoods and promoting economic development in rural regions.

2.1.2 Inequality

Inequality represents a pervasive issue, prompting extensive scholarly and policy-oriented efforts worldwide. Nations in the global North and South are contending with the social and economic consequences of persistent and escalating inequality. The universality of the problem may obscure the distinct causes of inequality that exist globally, especially in the post-colonial global South. Inequality continues to be one of South Africa's most significant socioeconomic challenges, enduring throughout the three decades since the end of apartheid. The country exhibits the highest income inequality globally (Sulla & Zikhali, 2023) and significant wealth inequality (Orthofer, 2023).

The World Bank report indicates that South Africa exhibits significant wealth inequality and economic polarisation, especially within labour markets (Masson, 2022). Wealth inequality surpasses income inequality, with estimates indicating that the top 10% of the population possesses 71% of total wealth, while the bottom 60% holds merely 7%.

Inequality among young agricultural entrepreneurs is a significant concern that impacts economic growth and social development. Empowering youth in agriculture may greatly enhance the wealth of their families and communities (Christopher, 2021). Societies must harness the whole potential of their youth as essential elements of human capital (Rickard, 2022). Facilitating equal access to resources and involvement in decision-making for all youth would enhance sustainable economies, benefit communities, and foster social progress (Demirgüç-Kunt et al., 2023).

Young agricultural entrepreneurs experience considerable economic marginalisation, hindering their access to essential resources and opportunities. An estimated 1.7 billion unbanked persons worldwide face obstacles to financial inclusion that impede their business potential (Demirgüç-Kunt et al., 2023). The Global Gender Gap Report (2023) indicates that differences in financial asset management and the uneven allocation of unpaid labour perpetuate economic inequities among young agri-preneurs. Access to financial services is restricted in several places, with just 60% of nations offering equitable chances for youngsters (World Economic Forum, 2022/2023). These elements sustain obstacles for young entrepreneurs endeavouring to thrive in agriculture and associated areas.

Inequalities among youth agri-preneurs are worsening in South Asia, Africa, the Middle East, and other developing nations (World Economic Forum, 2022/2023). Access to financing is essential for families, facilitating investments in long-term objectives such as enterprises, thereby improving their resilience to economic shocks (World Bank, 2023). Royce (2022) asserts that social inequality is fundamentally connected to the concept of poverty despite the distinction between the two. Youth represent a critical component of national development, and promoting economic growth is essential; however, statistics reveal a significant rate of youth unemployment in South Africa.

This scenario exists in a dual-logic economy, defined by a well-developed economic sector alongside a struggling economy. Lubchenco and Haugan (2023) highlight the increasing influence of inequality on economic development and political stability. The relationship between inequality and poverty in South Africa exacerbates the challenges encountered by youth agri-preneurs, as each factor adversely affects the other.

Francis and Valodia (2021) assert that inequality influences the overall rate of poverty reduction, independent of economic growth rates. Stagnant high inequality rates will inhibit pro-poor growth (Francis & Valodia, 2021). South Africa's declining GDP per capita is accompanied by increasing unemployment, poverty, and inequality

(Zhu et al., 2022). Significant income inequality remains prevalent, largely attributed to increasing labour market disparities, which are estimated to represent between 85 and 91 per cent of overall income inequality in the nation (Leibbrandt & Pabón, 2022). Therefore, a significant issue to consider is the persistent and escalating levels of inequality within society (Lubchenco & Haugan, 2023).

South Africa continues to rank among the most unequal nations globally (Espí et al., 2019; Francis and Webster, 2019; Beinart et al., 2020; Chatterjee et al., 2020; Francis & Valodia, 2021; Hundenborn, 2021; Leibbrandt & Pabón, 2022). The existing inequality levels are a result of the segregation and marginalisation of most of South Africa's population in all facets of socioeconomic development before and during apartheid (Leibbrandt & Pabón, 2022).

In the context of South Africa, poverty and inequality are frequently discussed together (Lee et al., 2023). This results in significant conceptual distinctions between poverty, defined by income levels at a specific threshold, and inequality, characterised by disparities among groups or individuals. Poverty is examined as an individualised metric, specifically the income level of an individual or the status of a multidimensional index about an income or multidimensional poverty threshold (Lee et al., 2023).

The literature indicates that agri-preneurship has the potential to mitigate wealth inequality by enabling historically disadvantaged individuals to engage as entrepreneurs within the agricultural sector. Land reform initiatives or cooperative farming models can facilitate wealth redistribution and promote economic inclusion. Agri-preneurship facilitates job creation, skills development, and income generation, particularly for marginalised groups such as youth. It can promote agricultural entrepreneurship, thereby reducing unemployment and addressing the root causes of inequality. Targeted interventions such as government support programmes, access to microfinance, and capacity-building initiatives are essential to address these inequalities.

2.1.3 Unemployment

Unemployment impacts both uneducated and educated youth. Youth unemployment in South Africa is currently at a critical level, with estimates indicating that approximately 59.6% of the nation's 31.9% unemployed demographic consists of individuals aged 15 to 24 years (Statistics South Africa (Stats SA), 2024). While the South African statistics specifically indicate the ages of 15-24 years, it is important to recognise that unemployment also impacts individuals older than 24 years.

Unemployment represents a significant challenge within capitalist societies, with its severity particularly pronounced in South Africa, rendering it a critical aspect of the nation's social landscape (Bundy, 2020). Since 1994, the South African economy has been marked by poverty, unemployment, and income inequality (Omay et al., 2021), positioning South Africa among the countries with the highest unemployment rates globally (Hartley et al., 2023).

Wage employment constitutes the primary income source for most South Africans. The absence of access to quality employment opportunities perpetuates persistent economic inequalities (Leibbrandt, 2021). The rising unemployment rates, persistent inflation, and lacklustre economic growth present pressing challenges that jeopardise the nation's potential for advancement (Sheefeni, 2022). Zizzamia (2020) posits that rural regions in South Africa experience marginalisation and underdevelopment, remaining remote from economic benefits and opportunities, a situation rooted in the historical context of apartheid. Consequently, young individuals in rural regions encounter diminished employment opportunities and often relocate to urban centres in pursuit of better prospects (Geza et al., 2022). Moreover, PWC (2021) observed that, in the wake of the COVID-19 pandemic, employment opportunities for skilled workers have demonstrated significantly greater resilience compared to those for unskilled and semiskilled positions.

Thus, agri-preneurship, conceived as a mechanism for alleviating unemployment and fostering economic advancement, can shift the current landscape by generating employment prospects for the rural youth of Nqabane Location and throughout South Africa. Entrepreneurship holds significant importance across all economic sectors, as it propels the economy towards its productive potential and fosters positive contributions to economic development and job creation, ultimately resulting in a decrease in unemployment (Bamford & Bruton, 2019; Bushe, 2019; Govuzela & Mafini, 2019; Blundel et al., 2021; Klofsten et al., 2021; Dhaliwal, 2022). Entrepreneurship fosters the establishment of new enterprises and plays a crucial role in ensuring economic stability and promoting growth, as evidenced by various scholarly contributions (Rezaei-Moghaddam & Izadi, 2019; Arafat et al., 2020; Nagadeepa et al., 2023). It is a fundamental priority within the economic policies of nations worldwide (Nagadeepa et al. 2023). Nagadeepa et al. (2023) assert that addressing the global challenges of poverty and food security is essential for achieving the sustainable development goal of zero hunger, with agricultural development being a crucial factor in this endeavour. In this regard, it is essential to analyse the social and cognitive elements that play a role in entrepreneurship within the agricultural sector (Mulibana & Tshikovhi, 2024).

3. Hypotheses

A statistical analysis was conducted under significant testing where the researchers posed a null hypothesis and attempted to reject that hypothesis (Borenstein, 2021). Thus, the following hypothesis was developed: H_0 : The triple challenges of poverty, inequality and unemployment do not affect unemployed youth in Nqabane.

4. Methodology

To determine whether a change in one variable was connected to a change in another, this study employed a quantitative research approach with a correlation design to examine predictions or hypotheses that suggested an association or relationship between variables (Kapingura, 2024; Karambakuwa, 2024; Schurink et al., 2024). The research paradigm employed was positivist. To validate priori hypotheses, which are frequently expressed quantitatively, positivism uses the hypothetico-deductive method, which allows for the derivation of functional relationships between explanatory and causative factors (independent variables) and outcomes (dependent variables) (Anakpo & Mishi, 2024; Bartley & Hashemi, 2024; Fouché, 2024). While the ontological orientation was based on objectivism, the epistemological orientation dealt with natural science models in positivist dynamics (Maredza et al., 2024).

A sample of 100 young people residing in Nqabane was taken. We used structured questionnaires to gather data. Because they provided actionable data, protected respondent identity, and covered every aspect of the study's topic, we used questionnaires (Masha & Eze, 2022). Furthermore, we were able to gather data on knowledge, attitudes, beliefs, feelings, and opinions regarding the topic of this study by using questionnaires (Boswell, 2023; Batchelor et al., 2022). Our ability to administer questionnaires to numerous cases was not only faster (Boswell, 2023), but it also enabled us to gather a significant amount of accurate, quantitative, and numerical data (Ali et al., 2022; Masha & Eze, 2022; Struwig & Stead, 2022). In addition to being more cost-effective (Kumar, 2020; Batchelor et al., 2022; du Toit, 2021), questionnaires took less time (Vriesema & Gehlbach, 2021; Jones, 2022; Nieuwenhuis, 2025).

SPSS software was used to analyse the data, and procedures for hypothesis testing were used to process the statistical findings. The Cronbach Coefficient value, which was higher than the necessary 0.70 Cronbach Coefficient was obtained after the reliability of the established factor structure was assessed.

As is customary, we received ethical clearance from Walter Sisulu University (WSU) (Sefotho, 2024). Before the start of data collection, we obtained respondents' informed consent (Anakpo & Mishi, 2024). We promised

respondents confidentiality and anonymity (Mishi, 2024), told them they could withdraw at any time without penalty (Hume & Baumgardner-Zuzik, 2023), and did not injure them in any way (Cannon & Delahoyde, 2023).

5. Study findings

5.1 Presentation and interpretation of findings of the extent to which the triple challenges affect unemployed youth in Nqabane

The objective of this study was to determine the extent to which the triple challenges affect unemployed youth in Nqabane. Below is a presentation and interpretation of the findings for the study's objective.

This study's questionnaire had a demographic section followed by two sections. The first of the two other sections is tabulated below in Table 1.

Table 1. Items from the questionnaire

Triple challenges	
A1	Youth suffer from poverty as one of the triple challenges
A2	Youth suffer from inequality as one of the triple challenges
A3	Youth suffer from unemployment as one of the triple challenges
A4	The triple challenges can be solved through youth agri-preneurship
A5	Most barriers need to be taken care of to solve the triple challenges

Findings from the questionnaire are found below (Table 2, Table 3 and Figure 1):

Table 2. Triple Challenges (TR)

	Item	Never	Rarely	Neutral	Often	Very Often
1	A1	0	0	0	30	70
2	A2	0	0	10	50	40
3	A3	0	0	0	40	60
4	A4	0	0	0	50	50
5	A5	0	0	0	70	30

Table 3. Descriptive statistics

	Item	Low	Neutral	High	mean	sd
1	A1	0	0	100	4.7	0.483
2	A2	0	10	90	4.3	0.675
3	A3	0	0	100	4.6	0.516
4	A4	0	0	100	4.5	0.527
5	A5	0	0	100	4.7	0.483

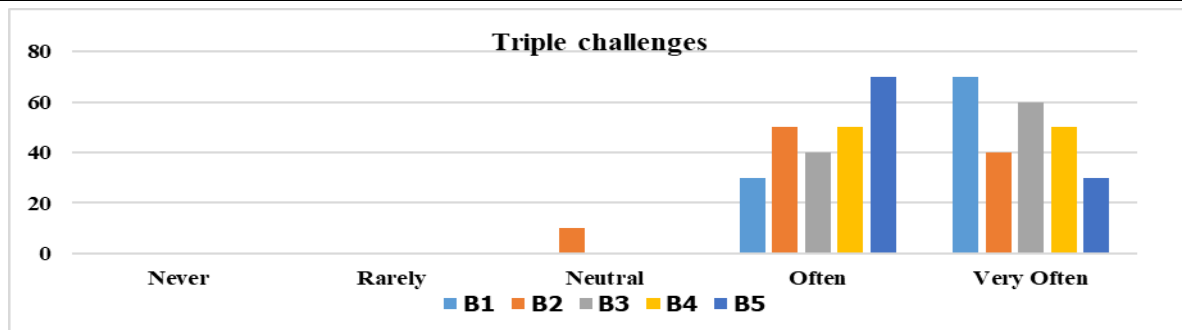


Figure 1. Likert scale plot for triple challenges

Where:

- A1 = youth suffer from poverty as one of the triple challenges
- A2 = youth suffer from inequality as one of the triple challenges
- A3 = youth suffer from unemployment as one of the triple challenges
- A4 = The triple challenges can be solved through youth agri-preneurship
- A5 = Most barriers need to be taken care of to solve the triple challenges

Table 3 provides descriptive statistics for the challenges. The statistics include the "low," "neutral," and "high" values, which indicate the range of responses for each challenge. Additionally, the table includes the mean and standard deviation (sd) values.

For challenge A1, the responses range from 0 (low) to 100 (high). The mean response is 4.7, indicating that, on average, respondents perceive the challenge of youth suffering from poverty as relatively high. The standard deviation is 0.483, suggesting a relatively low variability in responses.

For challenge A2, the responses range from 0 to 100. The mean response is 4.3, indicating that, on average, respondents perceive the challenge of youth suffering from inequality as relatively high. The standard deviation is 0.675, suggesting a higher level of variability in responses compared to the other challenges.

For challenge A3, the responses also range from 0 to 100. The mean response is 4.6, indicating that, on average, respondents perceive the challenge of youth suffering from unemployment as relatively high. The standard deviation is 0.516, suggesting a moderate level of variability in responses.

For challenge A4, the responses range from 0 to 100. The mean response is 4.5, indicating that, on average, respondents perceive the potential solution of youth agri-preneurship to the triple challenges as relatively high. The standard deviation is 0.527, indicating a moderate level of variability in responses.

For challenge A5, the responses also range from 0 to 100. The mean response is 4.7, indicating that, on average, respondents believe that most barriers need to be addressed to solve the triple challenges. The standard deviation is 0.483, suggesting a relatively low variability in responses. The construct reliability metrics are tabulated and expatiated below (see Table 4).

Table 4. Construct reliability metrics

	Alpha	rhoC	AVE	rhoA
Triple	0.661	0.784	0.512	0.828

Where:

Alpha: This column represents Cronbach's alpha, which is a measure of internal consistency reliability. It assesses the extent to which items within each construct are correlated with each other. Higher alpha values indicate better reliability. For example, TRIPLE has an alpha of 0.661.

rhoC: This column represents composite reliability (rhoC), another internal consistency reliability measure. Like alpha, higher values indicate better reliability. For example, TRIPLE has a rhoC of 0.784.

AVE: This column represents the average variance extracted (AVE), which assesses the amount of variance captured by the construct compared to the measurement error. AVE values above 0.5 are generally considered acceptable. For example, TRIPLE has an AVE of 0.512.

rhoA: This column represents the construct's composite reliability (rhoA), which is another measure of reliability. It indicates the proportion of true score variance in the construct relative to the total observed variance. Higher rhoA values indicate better reliability. For example, TRIPLE has a rhoA of 0.828.

The Cronbach Alpha method, which measures how well items in a set are positively correlated with each other, is often used. Using general criteria, reliability less than 0.60 is considered low, reliability in the range of 0.70 is considered acceptable, and reliability above 0.80 is considered good (Bougie & Sekaran, 2020; Pallant, 2020). To achieve sufficient reliability in these investigations, the author raised the reliability threshold above 0.60. Cronbach's alpha values for most of the constructs are above 0.70, which indicates that they have good internal consistency reliability. This means that the items in each scale are measuring the same construct consistently.

The reliability metrics in Table 5 below generally indicate acceptable levels of reliability for most constructs, as reflected by the high alpha.

Table 5. Indicator reliability (loadings^{^1})

Triple challenges		
A1	Youth suffer from poverty as one of the triple challenges	0.013
A2	Youth suffer from inequality as one of the triple challenges	0.842
A3	Youth suffer from unemployment as one of the triple challenges	0.806
A4	The triple challenges can be solved through youth agri-preneurship	0.702
A5	Most barriers need to be taken care of to solve the triple challenges	0.194
A1 and A5 have not been considered for tests of significance because they have Cronbach Alpha of lower than 0.70		

The loadings^{^1} values indicate how well each indicator loads onto its respective latent variable. In general, the loadings^{^1} values in this table are relatively high, which indicates that the indicators are reliable measures of their respective latent variables. The study's hypothesis testing is shown below (see Table 6).

Table 6. Testing hypotheses

	Triple challenges	Original estimates	T Star.	2.5% C1	97.5% C1	Decision	Remark
H₀₂ B2	Youth do not suffer from inequality as one of the triple challenges	0.918	19.811	0.808	0.958	Reject Ho	Significant
H₀₃ B3	Youth do not suffer from unemployment as one of the triple challenges	0.898	17.522	0.788	0.964	Reject Ho	Significant
H₀₄ B4	The triple challenges cannot be solved through youth agri-preneurship	0.838	6.553	0.492	0.927	Reject Ho	Significant

The interpretation of Table 4.5 is found below.

For each hypothesis (Ho), the table provides the following information:

H₀: The null hypothesis being tested, states that a particular factor is not required for the success of youth entrepreneurship.

Coefficient: The estimated coefficient for the factor being tested.

t-value: The t-value obtained from the hypothesis test.

Standard error: The standard error associated with the coefficient.

p-value: The p-value obtained from the hypothesis test.

Decision: Whether to reject or fail to reject the null hypothesis based on the p-value.

Significance: Indicates whether the factor is found to be significant for the success of the youth agri-preneurship.

This study employed a deductive logic approach, in which the researcher began with null hypotheses and subsequently collected data to ascertain whether empirical evidence supported the hypotheses, thereby enabling logical analysis and conclusions to be drawn based on the relationships obtained from the related variables (Dube & Shawe, 2022; Manzini & Mhakure, 2022; Ugwuanyi, 2022). Therefore, a statistical analysis was conducted under significant testing, in which the researcher posed a null hypothesis and endeavoured to refute it (Borenstein, 2021). In this case, some null hypotheses (H_{02} , H_{03} , H_{04}) are rejected based on the obtained p-values, indicating that all the factors tested are found to be significant for the success of youth agri-preneurship.

The coefficient of 0.959 suggests a positive correlation between the success of agri-preneurship and req_1. The coefficient is statistically significant, as evidenced by the t-value of 6.669. The calculated p-value is 0.839, which is less than the conventional significance level of 0.05. Consequently, the null hypothesis (req_1 not required) is denied, indicating that req_1 is indeed critical for the success of youth agri-preneurship.

The table outlines various hypotheses concerning the impacts of youth agri-preneurship on poverty, inequality, and unemployment. The hypotheses underwent testing through statistical analysis, yielding estimates, t-statistics, and confidence intervals.

The hypotheses (H_{02} to H_{04}) investigate the influence of youth agri-preneurship on poverty, inequality, and unemployment. The values range from -0.201 to 0.992, indicating various levels of positive correlations. The t-statistics and confidence intervals demonstrate that only some estimates are statistically significant, while others fail to achieve significance. This suggests that young agri-preneurship has substantially aided in alleviating the threefold issues of poverty, inequality, and unemployment in certain instances but not in others.

6. Interpretation of findings

This study's questionnaire had a demographic section followed by two sections. The discussions that follow below are for the first part of the two sections.

- B1 = youth suffer from poverty as one of the triple challenges
- B2 = youth suffer from inequality as one of the triple challenges
- B3 = youth suffer from unemployment as one of the triple challenges
- B4 = The triple challenges can be solved through youth agri-preneurship
- B5 = Most barriers need to be taken care of to solve the triple challenges

The reliability metrics generally indicate acceptable to good levels of reliability for most constructs is reflected by the high alpha. In this case, B1 and B5 have not been considered for tests of significance because they have Cronbach Alpha of lower than 0.70.

Therefore, findings from the questionnaire indicate that on average, most youth (90%) suffer from inequality as one of the triple challenges, all youth (100%) suffer from unemployment as one of the triple challenges, and all youth (100%) agree that the triple challenges of poverty, inequality and unemployment can be solved through youth agri-preneurship.

To test hypotheses, the t-statistics and confidence intervals indicate that only B1 and B5 failed to reach significance, while other estimates are statistically significant. This implies that youth agri-preneurship has a significant positive impact on alleviating the triple challenges of poverty, inequality, and unemployment in some cases. Therefore, the null hypothesis that the triple challenges of poverty inequality and unemployment do not affect youth agri-preneurs to a greater extent is rejected, and the alternative hypothesis that the triple challenges of poverty inequality and unemployment affect youth agri-preneurs to a greater extent is accepted.

The category of problems affecting young people in South Africa without jobs frequently referred to as the "triple challenges" of poverty, inequality, and unemployment, constitute a collection of issues that are intricate and interwoven and therefore need in-depth analysis.

Poverty plagues society (Prasetyo & Thomas, 2021). Many arguments surround poverty and inequality definitions, metrics, and concepts (Gumede, 2021). On a 1 USD = 18.95 ZAR exchange rate, the World Bank (2023) defines extreme poverty as living on less than \$2.15 a day, or R40.74 in South African Rands.

More South Africans are poorer than ever (Rudin, 2022). Masuku et al. (2023) say South Africa's progressive constitution and legislature guarantee equality and non-discrimination. The difficulty remains in implementing these policies to their maximum potential to enhance the lives of the historically disadvantaged, notably women, youth, and children.

Global poverty levels remain affected by the COVID-19 epidemic and economic issues as of 2023. In 2022, 712 million people lived in extreme poverty, up from pre-pandemic levels. This increase in extreme poverty shows a reversal of poverty decrease, especially in Sub-Saharan Africa.

Youth agri-preneurs face significant economic exclusion, impacting their ability to access vital resources and opportunities. A large percentage of unbanked individuals, estimated at 1.7 billion globally, experience barriers to financial inclusion that hinder their entrepreneurial potential (Demirgüç-Kunt et al., 2023). The Global Gender Gap Report (2023) highlights that disparities in financial asset management and unequal distribution of unpaid work contribute to persistent economic inequalities among young agri-preneurs. In many countries, access to financial services remains limited, with only 60% of nations providing equal opportunities for youth (World Economic Forum, 2022/2023). These factors perpetuate challenges for young entrepreneurs striving to succeed in agriculture and related sectors.

South Africa remains one of the most unequal countries in the world (Francis & Webster, 2019; Espi et al., 2019; Beinart et al., 2020; Chatterjee et al., 2020; Francis & Valodia, 2021; Hundenborn, 2021; Leibbrandt & Pabón, 2022). The current levels of inequality are the legacy of the segregation and marginalisation of most of its citizenry in every aspect of South Africa's socioeconomic development before and during apartheid (Leibbrandt & Pabón, 2022).

Unemployment affects not only uneducated youth but also educated youth. Youth unemployment is noted to be at its worst in South Africa, with estimations that about 60,7% of the country's 32,6% unemployed population is youth between the ages of 15 to 24 years (Statistics South Africa (StatsSA), 2024). Loosely translated, these rates show that almost one in every two young people of working age is unemployed (StatsSA, 2024). Although the South African Stats only stated the ages of 15-24 years, unemployment also affects more than 24 years.

The ever-increasing unemployment rates, inflation, and the sluggish growth of the economy are immediate challenges that pose a threat to the country's growth potential (Sheefeni, 2022). According to Zizzamia (2020), rural areas in South Africa are marginalised, underdeveloped, and distant from economic advantages and opportunities because of the legacy of apartheid. Thus, youth in rural areas face poorer employment prospects and migrate to cities to seek opportunities (Geza et al., 2022). Furthermore, PWC (2021) found that since the COVID-19 pandemic began, skilled employment has been much more durable than unskilled and semiskilled jobs.

Conclusions

This paper discusses the little-known facts regarding the effects of the triple challenges of unemployment, poverty, and inequality on unemployed youth in Nqabane. The alternative hypothesis, which states that youth agripreneurs are more affected by the triple challenges of poverty, inequality, and unemployment, is accepted to test the null hypothesis, which states that these issues do not have a greater impact on them.

These findings have far-reaching implications. They emphasise the pressing need for economic institutions and policymakers to encourage young people to pursue entrepreneurship and incorporate issues of agriculture into the field. Additionally, by bringing attention to the aspects of agripreneurship and encouraging stakeholders to think about ways to use agripreneurship to combat the triple challenges of unemployment, inequality, and poverty, the study adds to the body of literature.

The confluence of unemployment, poverty, and inequality greatly impacts the environment of youth agricultural entrepreneurship. Young agribusiness owners face significant obstacles because of these socioeconomic factors, especially in developing nations where opportunities and resources are frequently scarce. A comprehensive approach to agricultural entrepreneurship is necessary to address the complex problems of poverty, inequality, and unemployment. It also calls for a dedication to improving infrastructure, educational opportunities, and a policy environment that supports young people. This strategy can produce wider economic gains by empowering the upcoming generation of agripreneurs and promoting more sustainable agricultural practices.

The study admits its shortcomings, including the fact that it used a quantitative method to gather data. Future research might think about employing a mixed methods approach to get participants to provide detailed descriptions. In summary, poverty feeds a vicious cycle of young people not doing much business. Many young people experience high rates of unemployment and underemployment, particularly those who have graduated from agricultural schools. This reduces their chances of starting profitable agribusinesses. One of the most important factors in encouraging youth agricultural entrepreneurship is education. Enhancing educational programs and information access, according to several studies, can have a big impact on students' entrepreneurial intentions and encourage them to pursue careers in agriculture.

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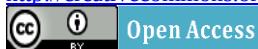
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IMPACT OF AI USE ON POSTGRADUATE STUDENTS: A SYSTEMATIC REVIEW

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Abstract. In the context of the fourth industrial revolution, postgraduate students in developing countries like South Africa increasingly employ artificial intelligence (AI) tools like ChatGPT to improve their academic performance. This study seeks to examine postgraduate students' viewpoints concerning the advantages of utilising AI tools, specifically ChatGPT, to attain academic achievement at historically disadvantaged universities in South Africa. This inquiry aims to achieve a comprehensive grasp of postgraduate studies in this sector through rigorous evaluation. There is an increasing trend in educational environments to integrate AI, particularly ChatGPT. This work employs a systematic review methodology to do a thorough literature evaluation of the impact of incorporating ChatGPT into teaching. The study utilises the Technology Acceptance Model to investigate the incorporation and uptake of ChatGPT in the postgraduate education of students from historically disadvantaged universities in South Africa. The conviction that ChatGPT enhances academic endeavours and streamlines research processes, therefore facilitating usability, underpins its acceptance and incorporation into postgraduate education. Consequently, postgraduate students are more inclined to view ChatGPT as a resource that can facilitate their academic pursuits. In light of these findings, educational institutions should create policies and procedures regarding the use of AI tools such as ChatGPT. Furthermore, postgraduate students must adhere to stringent standards enforcing a zero-tolerance stance on plagiarism.

Keywords: Artificial Intelligence (AI); university students; South Africa

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1. Introduction

ChatGPT is essential for postgraduate students since artificial intelligence (AI) swiftly revolutionises the worldwide higher education landscape (Cope et al., 2021). Berendt et al. (2020) underscore the duality of AI, encompassing both threats and advantages. Dwivedi et al. (2023) assert that ChatGPT significantly influences the research dimensions of higher education. Postgraduate students, especially those from affluent universities, employ ChatGPT to enhance their academic performance. The incorporation of ChatGPT into postgraduate education may significantly improve the learning experience for students, as highlighted by Bozkurt and Sharma (2023). Zhai (2022) asserts that ChatGPT markedly improves students' critical thinking and problem-solving skills. Moreover, ChatGPT functions as an essential resource for students to tackle diverse academic obstacles.

Launched on November 30, 2022, ChatGPT is a chatbot created by OpenAI, based on the Generative Pre-trained Transformer (GPT) model. It was developed in accordance with instructions, which were intended to respond to comprehensive prompts and directives (OpenAI, 2023). Since its inception, ChatGPT has achieved significant

popularity among students, educators, and researchers, amassing a user base exceeding 100 million (Council of the European Union, 2023). ChatGPT employs natural language processing to provide responses that mimic human conversation, enabling fluid interactions (Deng & Lin, 2022). In addition to translating, summarising, or elaborating on texts, ChatGPT executes intricate tasks like composing essays, articles, poems, and original computer codes (Tate et al., 2023; Williams, 2023).

Forman et al. (2023) describe how students use ChatGPT to achieve academic, social, and personal goals. The increasing use of ChatGPT in students' lives has prompted educators to reassess and adjust their teaching methods. While some consider ChatGPT and similar AI tools to be the future of education, others view them as a threat to developing critical skills, such as analytical and problem-solving abilities (Baidoo-Anu & Ansah, 2023). As a result, some educational institutions have banned the use of ChatGPT (Sullivan et al., 2023; Elsen-Rooney, 2023). However, integrating AI into higher education has already positively impacted student learning capabilities and satisfaction (Opara et al., 2023; Forman et al., 2023). Given the benefits of ChatGPT and its growing influence, prohibiting its use may not be a sustainable solution. By examining the effects of ChatGPT on learning and instruction and establishing clear guidelines for its use, educators can gain valuable insights (Baidoo-Anu & Ansah, 2023).

Neumann et al. (2023) note that ChatGPT offers immediate responses to user inquiries, facilitating communication. Neumann, Rauschenberger, and Schön (2023) define ChatGPT as a cutting-edge innovation that supports higher education in various capacities, such as assisting students with assessments. Strzelecki (2024) describes ChatGPT as the most extensive language model, capable of producing responses in seconds. Scholars like Mhlanga (2023), Rudolph et al. (2023), and Strzelecki (2024) consider ChatGPT one of the greatest innovations in artificial intelligence, capable of generating a high-quality 2,000-word response in under a minute. This efficiency illustrates the academic value ChatGPT can provide to higher education institutions. Rudolph and Tan (2023) describe ChatGPT as a groundbreaking language model capable of generating text that differs from human-written content. Heiser (2024) characterises it as a chatbot that can continue conversations fluidly, resembling human interaction. Unlike academic software such as Microsoft Office, EndNote, SPSS, and NVivo, which require licenses, ChatGPT is readily accessible (OpenAI, 2023). Due to its ability to replicate human-like dialogue, ChatGPT has become a significant part of the educational process. By offering instant responses to inquiries, facilitating group discussions, and assisting instructors in lesson planning, ChatGPT has the potential to improve student engagement (Imran & Almusharraf, 2023).

ChatGPT's transition from a non-profit organisation to a commercial business model has considerably impacted its users, making it an important consideration for educational institutions and students. Many studies have explored the factors influencing its implementation in education (Annamalai et al., 2022; Kasneci et al., 2023). This research often focuses on specific regions, and secondary research in South Africa has explored the role of ChatGPT in education. With a particular emphasis on ChatGPT, an advanced AI system capable of generating human-like responses, this paper aims to comprehensively review the literature on AI's impact on postgraduate students. The authors seek to offer valuable insights on integrating AI into educational contexts, benefiting students and promoting its responsible use by identifying key research areas. Additionally, this investigation contributes to the ongoing discussion about AI's role in postgraduate education.

2. Problem statement

In South Africa, the incorporation of ChatGPT into postgraduate education has introduced substantial challenges, such as an overreliance on the platform that may impede students' engagement in independent learning, critical thinking, and problem-solving skills (Sallam, 2023). Additionally, there are apprehensions about the dissemination of inaccurate information and the potential for academic dishonesty, as students may exploit AI to complete assignments without completely participating in the learning process (Godde et al., 2023). These

obstacles underscore the necessity of responsible usage, the cultivation of critical thinking, and the establishment of ethical standards to guarantee that the integration of ChatGPT is conducive to academic development while respecting academic integrity. Students and educators have grown increasingly fond of it due to its intuitive interactions and human-like responses (Cheung et al., 2023; Ding et al., 2023).

Additionally, its ability to receive user feedback facilitates ongoing enhancements in its accuracy and utility (Batubara et al., 2024). Nevertheless, there are apprehensions about the possible impediment to postgraduate students' independent learning, critical thinking, and problem-solving abilities due to an excessive reliance on ChatGPT (Sallam, 2023). Additionally, the potential for AI to facilitate academic dishonesty and disseminate inaccurate information remains a substantial concern (Godde et al., 2023). Consequently, to enhance the benefits of ChatGPT while preserving academic integrity and fostering intellectual development, it is imperative to encourage responsible usage, cultivate critical thinking, and establish ethical guidelines as it continues to impact postgraduate education.

3. Literature review

The optimistic influence of ChatGPT on postgraduate students

ChatGPT provides many advantages to educators and students in higher education, with a particular emphasis on language acquisition, academic support, and research. It allows language learners to improve their communication skills, practice dialogue, and receive responses (Rawas, 2024; Fauzi et al., 2023). ChatGPT facilitates language acquisition by presenting users with a wide variety of vocabulary and expressions. However, it is recommended that learners maintain a harmonious relationship with other learning activities to achieve a comprehensive and effective experience (Chukwuere, 2023). Besides language acquisition, ChatGPT is advantageous in the context of academic writing and research. Cooper (2023) emphasises the advantages of the prompt-rewrite command, which enables researchers to condense and elucidate lengthy sentences. Its utility for programming duties, such as program debugging, is underscored by Heiser (2024), which is a substantial advantage for IT students. Article summarisation, rephrasing for clarity, simplifying complex topics, solving mathematical problems, and summarising literature are all additional features that contribute to the academic journeys of both students and lecturers (Strzelecki, 2024; Xu et al., 2024).

It also assists lecturers in developing assignments, essay writing, and critical reflection, which are frequently difficult duties (Adeshola & Adepoju, 2024). ChatGPT, an online instructor, provides learning resources, concept explanations, and assignment assistance, thereby increasing student engagement (Wang et al., 2023). The natural language interface facilitates an enhanced educational experience, which enhances the interactive and pleasurable nature of learning (Currie et al., 2023). ChatGPT, a personalised learning aid, provides immediate feedback and adjusts to the learning preferences of each individual (Bommineni et al., 2023). It guarantees compatibility and interoperability by seamlessly integrating with current educational technologies (Prasetya & Syarif, 2023). ChatGPT enhances learning outcomes by offering personalised feedback and content tailored to each learner's unique requirements (Abd-Alrazaq et al., 2023; Xiao & Zhi, 2023). Glaser (2023) suggests that instructors can utilise ChatGPT to evaluate student submissions to comply with assignment specifications and pinpoint areas requiring further instruction. ChatGPT also functions as a creative writing instrument, facilitating the generation of ideas and the provision of constructive feedback to students (D. Yan, 2023). This is particularly advantageous for individuals who are not native English speakers, as it facilitates the genesis of ideas and the production of effective writing (C.K.Y. Chan & Hu, 2023). ChatGPT enhances publication efficacy by supporting idea generation, information synthesis, and data analysis as a research resource (Michalon & Camacho-Zuñiga, 2023). By necessitating concise prompts, the tool facilitates the effective expression and communication of ideas. Algaraady and Mahyoob (2023) have noted that ChatGPT is not as effective as human analysis in identifying errors in EFL writing, despite its numerous benefits.

The Revolutionary Function of ChatGPT in Postgraduate Education

As per Atlas (2023), ChatGPT is an indispensable AI instrument for communication in higher education. In India, postgraduate students utilise it to improve their reading abilities and complete research assignments punctually (Mohammed et al., 2024). Enhancing writing abilities and offering assistance with the editing process benefits students and academics (Ogurlu & Mossholder, 2023). To enhance their writing style, students utilise ChatGPT's digital writing assistance in both undergraduate and postgraduate environments (Rudolph et al., 2023). Firaina and Sulisworo (2023) emphasise the significance of Ray (2023) in assisting postgraduate students in acquiring new knowledge, cultivating research skills, and facilitating resource access. Additionally, ChatGPT facilitates exploratory enquiries, which are fundamental to developing academic skills (Aithal & Aithal, 2023) and assists in creating academic writing that is free of errors (Sallam, 2023). Fatimah (2024) emphasises its role in fostering students' confidence and enthusiasm for research by providing scientific research guidance. Baldassarre et al. (2023) observe that it offers academic and personal support throughout the research voyage. ChatGPT facilitates rapid adaptation to research environments by providing simple access to research-related information (Farrokhnia et al., 2023) and promoting a resilient research experience (Qadir, 2023). It facilitates the development of enticing research topics, thereby improving academic performance (Nisar & Aslam, 2023) (Yan, 2023). According to scholars such as Alshater (2022) and Lin (2023), it has the potential to enhance academic research in higher education.

The effects of ChatGPT on education

Increasing research suggests that instructors can utilise ChatGPT to automate the evaluation of essays, articles, and other written assignments, so liberating time for additional teaching responsibilities (Kasneci et al., 2023). Research indicates that deep-learning models may effectively assess students' essays and deliver feedback akin to that of human evaluators (Liang et al., 2018; Lu & Cutumisu, 2021). Educators can utilise reports generated by these models to discern strengths and weaknesses in pupils' writing, enabling them to target areas of difficulty. This may assist instructors in more effectively targeting interventions (Kasneci et al., 2023). ChatGPT can aid academic personnel in creating evaluations that correspond with the learning objectives and success criteria of the lesson (Baidoo-Anu & Ansah, 2023). A standardised framework can alleviate educators' efforts and improve assessment quality, as creating quizzes, tests, and exams is sometimes time-intensive (Zhai, 2023). Studies suggest that ChatGPT may serve as a personal tutor for pupils. Cai et al. (2021) created a conversational bot utilising a generative model to deliver personalised mathematics education. The algorithm produced feedback customised to students' errors, which Cai et al. (2021) said may enhance learning outcomes. Mhlanga (2023) and Qadir (2022) observed that ChatGPT can aid students with coursework, assignments, projects, and mathematics difficulties, promoting increased independence and self-direction in learning. ChatGPT can generate outlines for articles and other writing endeavours, assisting students in organising their thoughts for research and composition (Kasneci et al., 2023).

Furthermore, educators can utilise ChatGPT to create and integrate interactive classroom activities, enhancing their instructional methodologies. ChatGPT can provide lesson plans, worksheets, presentations, and other visual aids, assisting educators in delivering more engaging and dynamic courses that address students' learning requirements (Atlas, 2023; Hertf Educator, 2023). Furthermore, Rudolph et al. (2023) proposed that educators may leverage ChatGPT's functionalities to adopt a reversed classroom model and formulate novel pedagogical tactics. This would enable students to become autonomous learners, facilitating their study both in the classroom and online.

ChatGPT offers valuable opportunities in education-related disciplines, particularly for postgraduate students. Vargas-Murillo et al. (2023) emphasised its ability to transform how students generate and execute texts and assignments, improving the efficiency of academic writing. Zhang and Tur (2024) highlighted its potential to modernise traditional teaching methods, such as supporting collaborative projects through structured discussions, providing real-time feedback, and functioning as a virtual tutor for independent study (Lo, 2023; Zhang & Tur,

2024). Postgraduate students in language education can use ChatGPT to create adaptive and compelling learning environments (Imran & Almusharraf, 2023). Additionally, ChatGPT can assist in developing learning tasks, assessments, teaching strategies, and workload optimisation (Lo, 2023). Furthermore, ChatGPT facilitates research processes, including medical writing, and is a clinical assistant for medical professionals (Garg et al., 2023). İpek et al. (2023) argue that ChatGPT is a versatile tool postgraduate students can use to improve their academic and professional work, contributing to better productivity and innovative approaches across disciplines.

The obstacles that ChatGPT presents in the field of education

Although ChatGPT offers numerous advantages, it also presents significant challenges that require attention. One major concern is its potential threat to academic credibility and integrity. Academic misconduct may arise if students fail to properly acknowledge the sources or ChatGPT in their assignments (Kleebayoon & Wiwanitkit, 2023; Thurzo et al., 2023). Recent studies have shown that sophisticated AI tools like ChatGPT can bypass traditional plagiarism detection software such as Turnitin. This could encourage students to submit AI-generated content as their own (Khalil & Er, 2023). Students who use ChatGPT for their assignments are more likely to commit plagiarism than those who do not (Basic et al., 2023).

Furthermore, researchers have highlighted that using ChatGPT in education may hinder teachers' ability to assess students' true understanding (Grassini, 2023; Sullivan et al., 2023). Educators may struggle to gauge the extent of students' comprehension, leading to hidden learning deficiencies. This can complicate the development of effective intervention strategies and early support (Grassini, 2023). Another significant concern is the potential for ChatGPT to generate harmful content, which could result in negative outcomes (Imran & Almusharraf, 2023; İpek et al., 2023). Additionally, Vargas-Murillo et al. (2023) and Zhang and Tur (2023) emphasise the risk of dependency, where students heavily rely on ChatGPT, potentially stunting their intellectual growth and productivity.

The tool can also contribute to academic misconduct, including cheating and plagiarism, as students might use it to generate essays or assignments (Lo, 2023). According to Godde et al. (2023), experts and plagiarism detection software often struggle to distinguish AI-generated content from human-written text. Ethical issues like user privacy, data security, and bias in the data used to train ChatGPT are also concerns (Zhang & Tur, 2023). Researchers emphasise the need for clear guidelines to ensure the ethical and responsible use of ChatGPT (Lo, 2023; Sallam, 2023; Zhang & Tur, 2023). These challenges are reinforced by empirical evidence, particularly regarding issues of plagiarism and deception (Singh et al., 2023). Basic et al. (2023) discovered that AI-generated text was more common in assignments submitted by ChatGPT users, and Aguilos and Fuchs (2023) found that some students admitted to copying chatbot-generated text without proper citations, often due to laziness or convenience.

Consequently, various research studies (e.g., Bernabei et al., 2023; Chan, 2023; Gorichanaz, 2023; Tlili et al., 2023) have advocated for policies to govern the use of AI tools in education. The efficacy of ChatGPT allows students to produce whole assignments from its responses, so circumventing the utilisation of their analytical and decision-making skills (Sok & Heng, 2023), which may impede the cultivation of vital competencies. Depending too much on ChatGPT may make it harder to develop skills like research, creativity, critical thinking, and problem-solving (Kasneci et al., 2023; Sullivan, 2023); this could hurt students' academic and professional success (Sok & Heng, 2023). Furthermore, the quality and reliability of ChatGPT's results are occasionally scrutinised because of their dependence on extensive volumes of unrefined data (Rahimi & Abadi, 2023; Sallam, 2023). The quality of the tool's output is contingent upon the diversity of the training data; if biases exist within these datasets, such as those favouring affluent nations or particular demographics, the resultant content may also exhibit bias (Mbakwe et al., 2023; Lucy & Bamman, 2021). ChatGPT is susceptible to producing erroneous information, concocting articles, and supplying fictitious URLs or references (Gordijn & Have, 2023; Baidoo-

Anu & Ansah, 2023). Additionally, ChatGPT only uses data from before 2021 (Rahimi & Abadi, 2023; Hassani & Silva, 2023), so it might not be able to answer questions about specific topics or recent events reliably.

4. Methodology

This paper used a systematic review to assess the impact of AI on postgraduate students, and the review followed the established guidelines, including the Prisma protocol. The corpus of literature concerning the impact of ChatGPT on postgraduate students was comprehensively examined using multiple databases. The following databases are included: PubMed, Web of Science, IEEE Xplore, Scopus, Google Scholar, ACM Digital Library, ScienceDirect, JSTOR, ProQuest, SpringerLink, EBSCOhost, and ERIC. Their comprehensive coverage informed the selection of these databases of scientific and scholastic publications in various fields, such as education, artificial intelligence, computer science, and technology. Our approach to search was methodical, incorporating pertinent keywords together. These keywords encompassed "ChatGPT," "AI ChatGPT," "artificial intelligence," "ChatGPT on postgraduate students," and "impact of AI ChatGPT on higher education." We optimised our search strategy to guarantee that it produced the most pertinent articles for our exploratory review (Peters et al., 2015). The study relied on explicit criteria to identify pertinent literature regarding the influence of ChatGPT on higher education. Inclusion criteria encompassed peer-reviewed articles, systematic reviews, top media reports, conference proceedings, and book chapters in English, emphasising the use of AI chatbots in postgraduate education. Sources that were not academic, tangential mentions, and incomplete or non-English texts were excluded. Following the PRISMA-P guidelines, data extraction was used to record the authors, publication year, study design, ChatGPT applications, and results.

Theoretical framework

In 1989, Fred Davis formulated the technology acceptance model (TAM), which underpins this study. In the realm of information and communication technology research, the Technology Acceptance Model (TAM) is often employed to elucidate user acceptance behaviour, particularly by focusing on forecasting the uptake and acceptance of novel technologies. According to Davis (1989), users typically acknowledge that technology enhances their performance in their professional domains. Liu (2023) asserts that the Technology Acceptance Model (TAM) is based on two core principles: perceived ease of use and perceived usefulness. This indicates that individuals' adoption and utilisation of technology depend on their perceptions of its utility in their lives and its facilitation of their daily activities or work. This study utilises the technological acceptance model to examine the integration and uptake of ChatGPT among postgraduate students from historically disadvantaged universities in South Africa. The conviction that ChatGPT is beneficial for academic endeavours (perceived utility) and that it facilitates research tasks, enhancing usability (perceived ease of use) underpins its adoption and incorporation into postgraduate education. Consequently, postgraduate students are more inclined to believe that ChatGPT can facilitate their academic journey, recognising its utility in their scholarly endeavours, thereby enhancing the likelihood of their acceptance of ChatGPT.

5. Findings and Discussions

Enhanced Academic Writing

A review of several studies shows that graduate students, especially those who have done research, often use ChatGPT, an AI tool, to improve their academic writing skills. Studies have also shown how important it is for students to use this AI tool for brainstorming, digital writing, and learning new words. It also helps with data analysis and writing papers for release. These results are in line with what other researchers have found. They said that ChatGPT has many benefits for students and teachers in higher education, especially when it comes to language learning, academic help, and research. Rawas (2024) and Fauzi et al. (2023) say that it helps language learners improve their conversation skills by letting them practice dialogue and get answers. ChatGPT helps

people improve their language skills by showing them a lot of different words and phrases. Chikwuere (2023) says that students should balance using it with other tasks to get the most out of their time with it. ChatGPT is useful for more than just learning languages. It's also helpful for studying and writing for school. Cooper (2023) talks about how useful the prompt-rewrite command is because it helps researchers cut down on and make sense of long lines. Heiser (2024) says it is helpful for coding jobs like debugging programs, which is a big plus for IT students. It can also summarise articles, rephrase them to make them clearer, break down difficult topics, solve math problems, and summarise books. These features help students and teachers with schoolwork (Strzelecki, 2024; Xu et al., 20248).

Risks of using Artificial intelligence tools

Despite the numerous advantages of using artificial intelligence tools, research has identified many risks and drawbacks associated with their use (ChatGPT). Research indicates that the tool may occasionally generate misleading literature, and its use of AI can result in academic malfeasance, such as plagiarism. Additionally, this tool may present challenges, such as a dependence on AI that could impede the intellectual development of students. According to research, AI does not adhere to ethical considerations associated with its use. Scholars contend that ChatGPT presents significant challenges that necessitate attention, which supports these findings. Its capacity to produce hazardous content is a significant concern (Imran & Almusharraf, 2023), which could result in unfavourable consequences (İpek et al., 2023). It is also possible for students to abuse ChatGPT to generate essays or coursework, which can lead to academic misconduct such as plagiarism and deception (Lo, 2023). The potential for dependency to arise when students significantly rely on ChatGPT, as emphasised by Vargas-Murillo et al. (2023) and Zhang and Tur (2023), can impede their intellectual development and productivity. Artificial intelligence-generated content is frequently challenging to identify, even for plagiarism detection software and experts (Gödde et al., 2023). There are also ethical concerns regarding data security, user privacy, and biased data (Zhang & Tur, 2023). The necessity of effective guidelines to guarantee the ethical and responsible application of ChatGPT has been underscored by researchers (Lo, 2023; Sallam, 2023; Zhang & Tur, 2023). These challenges are further emphasised by empirical evidence from studies, in particular plagiarism and deception (Singh et al., 2023). According to Basic et al. (2023), using AI-generated text was more prevalent in assignments submitted by ChatGPT users. Fuchs and Aguilos (2023) observed that certain students confessed to copying chatbot-generated text without citations, commonly motivated by laziness and convenience. Numerous studies (e.g., Bernabei et al., 2023; Chan, 2023; Gorichanaz, 2023; Tlili et al., 2023) have advocated for establishing policies that govern using AI tools in education.

Conclusion

ChatGPT has a transformative effect on higher education, providing substantial benefits to both students and educators in the areas of language acquisition, academic support, and research. It offers a powerful platform for language learners to enhance their communication abilities, as well as assistance with academic writing and research. It is an invaluable tool in a variety of fields due to its capacity to assist with duties such as summarising, debugging, and rewriting. Nevertheless, ChatGPT is not without its obstacles. There is a need to address concerns regarding academic misconduct, dependency, and the ethical implications of AI-generated content. It is imperative to establish policies that guarantee AI's ethical and responsible application in education. Although ChatGPT improves learning outcomes and encourages engagement, its potential for abuse necessitates meticulous regulation and oversight. The integration of ChatGPT into academic settings should be further refined, and future research should investigate the diverse impact of ChatGPT across various educational contexts. This paper provides innovative perspectives on the dynamic role of ChatGPT in academia, highlighting its advantages and possible drawbacks. Additional research is required to investigate the optimal balance between its application and the ethical implications it presents. Moreover, subsequent research could concentrate on particular disciplinary contexts to elucidate how ChatGPT's influence may change across other academic domains. Ultimately,

suggestions for formulating rules and policies for its ethical use could significantly contribute to ensuring that ChatGPT enriches the educational experience while upholding academic integrity.

Limitations

One of the key limitations in the context of examining the impact of artificial intelligence (AI) on postgraduate students lies in the reliance on existing literature, which may not fully encompass the most recent developments in AI technology or its practical applications within educational settings. Secondary research is often based on previously published studies, which may become outdated or limited in scope, especially in a rapidly advancing field like artificial intelligence. As tools such as ChatGPT continue to evolve, existing research may fail to account for the latest innovations, adjustments in AI integration, or shifts in its application within postgraduate education. Additionally, secondary studies typically lack direct, firsthand insights from students, which diminishes their ability to provide an accurate reflection of the real-world experiences, challenges, and benefits that postgraduate students face when utilising AI tools. Furthermore, the quality and reliability of secondary sources can vary, potentially introducing biases or incomplete representations of AI's impact on students. Finally, secondary research may not adequately address regional variations, such as the unique challenges encountered by postgraduate students in developing countries like South Africa, where disparities in access to technology and educational resources may exist, influencing the applicability and generalizability of findings.

Recommendations

It is recommended that organisations establish policies and procedures concerning the utilisation of artificial intelligence tools (ChatGPT). Postgraduate students should be subject to policies with a zero-tolerance policy on plagiarism. The institution ought to make use of AI-based detection technologies for postgraduate students. The ethics surrounding the application of artificial intelligence should be taught to postgraduate students by educational institutions.

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