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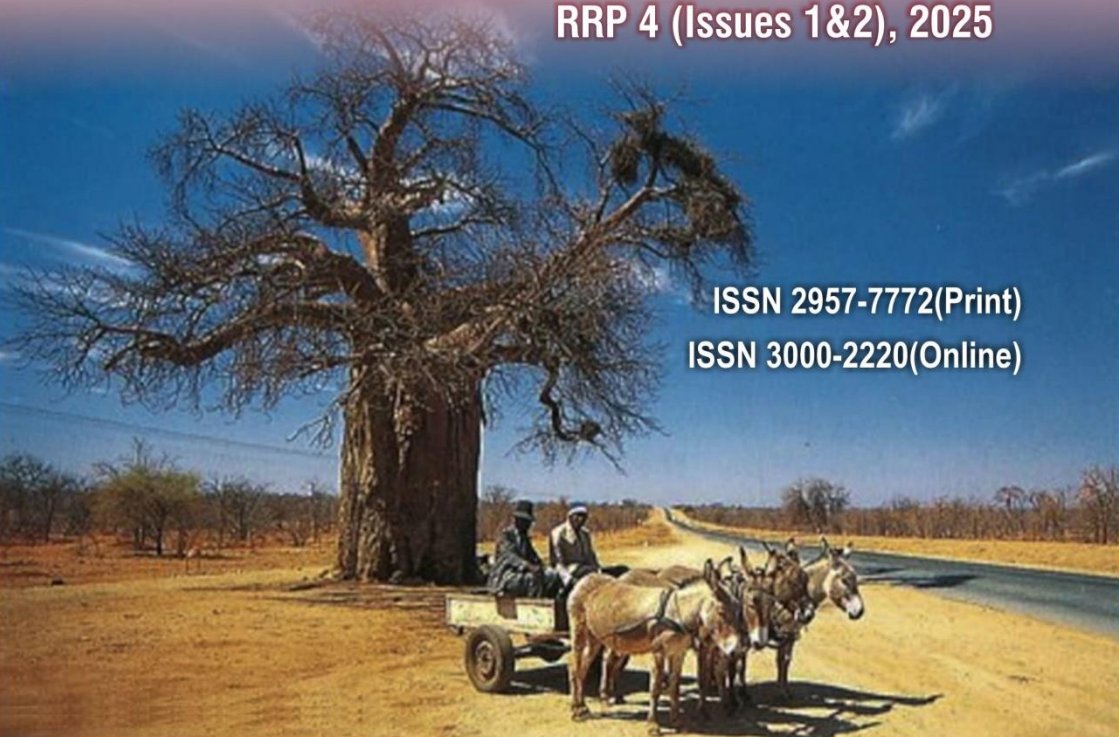

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About the Journal

JOURNAL PURPOSE

The purpose of the *Review of Rural Resilience Praxis is* to provide a forum for disaster risk mitigation, adaptation and preparedness.

CONTRIBUTION AND READERSHIP

Sociologists, demographers, psychologists, development experts, planners, social workers, social engineers, economists, among others whose focus is that of rural resilience.

JOURNAL SPECIFICATIONS

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SCOPE AND FOCUS

As much as the urban territory is increasing by each day, the rural economy, especially in many developing countries, still retains a great proportion of the extractive and accommodation industry. Retaining some space as rural remains critical given the sectors role in providing ecosystem services to both wildlife and humanity. In this light, rural resilience as practice beckons for critical studies especially in the face of the ever-threatening extreme weather events and climate change that then impact on the livelihoods and lifestyles of the rural communities. Review of Rural Resilience Praxis (RRRP) comes in as a platform for critical engagement by scholars, practitioners and leaders as they seek to debate and proffer solutions of the rural sector and trying to champion the philosophy of the right to be rural. The issue of conviviality between the different constituencies of the sectors, compiled with the competing challenges of improving rural spaces while also making the conservation and preservation debates matter is the hallmark of this platform of criticality. The journal is produced bi-annually.

Guidelines for Authors for the Review of Rural Resilience Praxis

Articles must be original contributions, not previously published and should not be under consideration for publishing elsewhere.

Manuscript Submission: Articles submitted to the *Review of Rural Resilience Praxis* are reviewed using the double-blind peer review system. The author's name(s) must not be included in the main text or running heads and footers.

A total number of words: 5000-7000 words and set in 12-point font size width with 1.5 line spacing.
Language: British/UK English
Title: must capture the gist and scope of the article
Names of authors: beginning with the first name and ending with the surname
Affiliation of authors: must be footnoted, showing the department and institution or organisation.
Abstract: must be 200 words
Keywords: must be five or six containing words that are not in the title
Body: Where the authors are more than three, use *et al.,*
Italicise *et al.*, *ibid.,* words that are not English, not names of people or organisations, etc. When you use several authors confirming the same point, state the point and bracket them in one bracket and in ascending order of dates and alphabetically separated by semi-colon e.g. (Falkenmark, 1989, 1990; Reddy, 2002; Dagdeviren and Robertson, 2011; Jacobsen *et al.,* 2012).

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Dam Infrastructure Provision in Rural Africa: Some Selected Country Case Studies

RUMBIDZAI MPAHLO[1] AND PARTSON PARADZA[2]

Abstract

The study examines the provision of dam infrastructure in rural Africa through case studies from selected countries, aiming to assess challenges, opportunities and impacts on water resources and economic development. By reviewing literature and empirical data, it offers insights into dam infrastructure's effectiveness in addressing rural communities' water and energy needs. Through case study analysis, the study identifies lessons for future development efforts. It argues that dam infrastructure has potential to address water scarcity, promote agriculture and enhance energy security, contingent on factors like funding, governance and community involvement. The major objective is to assess dam projects' impacts on water access, agriculture and energy security in rural Africa and to identify lessons for future efforts. Key questions addressed are the challenges and opportunities of dam provision, their impacts on rural communities and lessons learned from case studies. Methodologically, the study employs desk-based research and case study analysis, drawing data from academic journals, government reports and non-governmental organisation (NGO) publications. For data analysis, the study utilises textual analysis to examine and interpret the qualitative information gathered from the selected case studies and other relevant sources. The study recommends careful planning, stakeholder engagement and environmental stewardship to ensure dam infrastructure sustainability and success in rural Africa.

Keywords*: water resources, economic development, rural communities, scarcity, agriculture, governance*

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INTRODUCTION

There is global consensus that water infrastructure development is key to attaining the UN Sustainable Development Goals (SDGs) (UN Water, 2014; Ait-Kadi, 2016; 2018; Sachs *et al.*, 2020). Specific targets in the SDGs related to water infrastructure include achieving universal access to electricity and increasing renewable energy, improving number of populations with safely managed water, sanitation and hygiene, providing efficient agricultural and flood control systems and protecting water-related ecosystems (United Nations Development Programme, 2015). Sub-Saharan Africa has specific needs in water supply, sanitation, agricultural development and energy production (Grigg, 2019; Arimah, 2017). Many developing countries have used mega-dams as a source to generate electricity, water for irrigation and to facilitate urban and industrial uses (Abdull *et al.*, 2020).

The provision of dam infrastructure in rural Africa plays a crucial role in addressing water scarcity, promoting agricultural development and enhancing energy security (Mabhaudhi *et al.*, 2018). However, the success of such projects often depends on various factors, including funding, governance, environmental sustainability and community participation. This article examines the experiences of selected African countries in implementing dam projects in rural areas and to identify key lessons learned for future development efforts. The main argument of the study is that the provision of dam infrastructure in rural Africa has the potential to address critical challenges related to water scarcity, agricultural development and energy security. However, the effectiveness of such projects depends on various factors, including funding, governance, environmental sustainability and community participation.

The major objective of the study is to examine the provision of dam infrastructure in rural Africa through the analysis of selected case studies. By doing so, the study seeks to assess the challenges, opportunities and impacts of dam projects on water resources, agricultural development and energy security in rural African communities. Additionally, the study identifies key lessons learned from these case studies which are used to inform future development efforts and enhance the effectiveness and sustainability of dam infrastructure provision. This research contributes valuable insights to the

broader body of knowledge on infrastructure development in Africa, serving as a resource for policy-makers, practitioners and researchers engaged in water and energy projects in rural areas. Through addressing these objectives, the study provides comprehensive answers to the three major questions posed, thereby shedding light on critical issues surrounding dam infrastructure provision in rural Africa.

The study is organised as follows: The conceptual framework will follow, wherein SDGs set by the United Nations, particularly Goal 6 (Clean Water and Sanitation) and Goal 7 (Affordable and Clean Energy), are highlighted as the guiding principles for assessing the provision of dam infrastructure in rural Africa. This is followed by a comprehensive literature review which examines existing research and perspectives on the impacts of dam projects on water resources, agricultural development and energy security in rural African communities. Subsequently, the research methodology section outlining the approach taken to collect and analyse data, incorporating a combination of desk-based research and case study analysis. The findings section presents the empirical results of the study, detailing the challenges, opportunities and impacts identified through the analysis of selected case studies. This is followed by a discussion, wherein the implications of the findings are critically analysed. The study then concludes by summarising key insights and providing recommendations for policyimakers, practitioners and researchers involved in dam infrastructure provision in rural Africa.

CONCEPTUAL FRAMEWORK

The conceptual framework for the study is based on the SDGs set by the United Nations, particularly, Goal 6 (Clean Water and Sanitation) and Goal 7 (Affordable and Clean Energy). The study assesses the contribution of such projects to the overall socio-economic development of rural communities in Africa through analysing the outcomes of dam infrastructure provision within the context of these goals. The water demand is increasing day by day as the world population rises. The United Nations (UN) (2015) highlights that billions of people will face the lack of this basic resource by 2030 unless progress grows four times the present. SDG6 seeks to ensure that there is the availability and sustainable management of water and sanitation for all by 2030. The goal targets to ensure that there is universal and equal access to safe

drinking water. Moreover, availability of water to all means improved sanitation and hygiene to people. As the demand for water is outpaced by population growth, the world is facing severe water shortages (*ibid.*). The goal also seeks to improve the quality of water by reducing pollution and eliminating the dumping of hazardous materials in water reservoirs. To add more, the recycling and re-use of water are encouraged on a global scale. It is also the goal's target that by 2030, the number of people suffering from water scarcity is minimised by increasing the efficient use of water across all sectors of the economy. Communities are encouraged to restore and protect all water-related ecosystems like dams, rivers and lakes. The goal also encourages international cooperation and capacity-building support primarily in developing countries to increase water and sanitation-related activities and programmes. Water harvesting, recycling and re-use technologies of water are put at the forefront of these initiatives.

LITERATURE REVIEW:

A review of existing literature reveals a range of perspectives on the impacts of dam infrastructure provision in rural Africa. While some studies highlight the potential benefits of increased water storage and hydroelectric power generation (van Dijk *et al.*, 2016; Patsialis *et al.*, 2016; Dillon and Fishman, 2019), others raise concerns about the social and environmental consequences of large-scale dam projects. Key issues include displacement of communities, loss of biodiversity and the potential for conflicts over water resources. Rural communities worldwide face mounting challenges in meeting their water demands, a situation exacerbated by the looming threats of climate change-induced water shortages (Huang *et al.*, 2017). To address these challenges, various strategies have been proposed. Ritchie *et al.* (2021) advocate for climate change-driven water insecurity, particularly in rural areas, through measures such as water harvesting, including dam construction and roof tanks. Specifically, in dryland regions, rural communities often resort to building sand dams, small structures constructed across sandy streambeds to capture infrequent but intense rainfall for domestic and agricultural purposes (*ibid.*). These initiatives not only improve water storage, but also enhance the quality of stored water while reducing evaporation (Quinn *et al.*, 2018; Eisma and Merwade, 2020).

However, the provision of dam infrastructure in rural Africa presents both opportunities and challenges that demand careful consideration. Dillon and Fishman (2019) argue that while dams offer multiple benefits, including improved water and energy access, they also entail financial, environmental and distributional impacts which can affect their overall costs and benefits. Moreover, there exists a misalignment between the needs of rural residents and the priorities of sponsoring organisations implementing water harvesting techniques, with insufficient attention paid to socio-cultural factors in these areas (Wanyoni, 2013; Yemenu *et al.*, 2014; Lasage and Verburg, 2015). This disparity has contributed to numerous socio-environmental disputes globally, with a significant portion directly linked to the development of hydropower facilities and dams (Environmental Justice Atlas, 2018). Such conflicts underscore the importance of holistic and community-centred approaches to water resource management and infrastructure development.

Despite the challenges posed by dam construction in rural areas, these infrastructural projects hold the potential to alleviate poverty and foster sustainable development. Malek *et al.* (2017) highlight two primary pathways through which dam construction contributes to poverty reduction: firstly, by enhancing agricultural productivity and income through improved water access and management, thereby revitalising economic activities in rural regions; and secondly, by creating alternative economic opportunities and generating employment opportunities. However, it is crucial to note that local communities often harbour negative perceptions towards large dam projects due to concerns over environmental degradation, displacement and social disruption (Biswas and Tortajada, 2012); Everard, 2013; Isaacman, 2013; Tischler, 2013).

Nevertheless, Maher *et al.* (2019) emphasise that community acceptance of dam projects can be fostered through well-planned Corporate Social Responsibility (CSR) strategies. These strategies should encompass impact mitigation measures, robust community engagement and transparent dialogue and consensus-building processes. By integrating the interests and concerns of local communities into project planning and implementation, dam

construction initiatives not only can address water and energy needs but also contribute to sustainable development and inclusive growth in rural areas.

Hydraulic infrastructure development, particularly the construction of dams, plays a crucial role in shaping and expanding state power (Akhter, 2015). Governments and communities alike perceive dam projects as avenues for enhancing agricultural productivity, electricity generation and irrigation systems, especially in regions where water availability constrains cropping systems (Abdull *et al.*, 2020). These projects symbolise the modern state's technological and economic prowess, signifying efforts to reconfigure resource distribution (Mitchell, 2002). However, the construction of dams often entails the displacement of communities from their ancestral lands, a process justified as necessary for nation-building and the pursuit of modernity (Kaika, 2006; Haines, 2013; Miescher, 2014). While such displacement may foster economic activities and job creation in dam construction areas, it also raises concerns about social justice and inclusion. Despite the emphasis on partnership and participation in rural development policies, there remains a significant gap between policy decisions and the social realities experienced by rural residents (Langille *et al.*, 2008 Shortall and Warner, 2010;). This exclusion can lead to conflicts, social losses, violations of legal rights and even social discrimination, particularly in marginalised communities affected by dam construction (Tilt *et al.*, 2009; Fazeli, 2010; Beck *et al.*, 2012).

Moreover, the construction of dams often perpetuates infrastructural violence, disproportionately affecting marginalised communities while benefiting the elite (Beck *et al.*, 2012). Despite potential improvements in infrastructure, such as road networks, resulting from dam projects (Malek *et al.*, 2017), these developments may not necessarily address the underlying social injustices and disparities. While improved road connectivity may enhance access to previously marginalised areas, boost tourism and facilitate the transportation of agricultural produce, it does not necessarily address the root causes of social exclusion and inequality in rural communities impacted by dam projects. Therefore, while dam construction may bring tangible benefits in terms of infrastructure development, its social impacts underscore the

importance of ensuring equitable and inclusive development processes that prioritise the well-being and rights of affected communities.

RESEARCH METHODOLOGY

The study employs a secondary research approach, predominantly desktop research, to investigate the availability and challenges of dam infrastructure in rural districts in Zimbabwe. Secondary research involved the review and analysis of existing literature, documents and datasets relevant to the research topic. The primary method of data collection involves a comprehensive review of literature from various sources, including books, journal articles and government policy documents related to dam infrastructure initiatives. Both developing and developed countries were considered to provide a comprehensive understanding of global trends and best practices in dam infrastructure development. Search engines such as Google Scholar and ScienceDirect and Scopus were used to access relevant academic articles and documents.

Data were collected through a literature review and analysed using thematic analysis to identify recurrent themes and patterns pertinent to the study's objectives. Textual analysis was also employed to examine data in detail, while content analysis was utilised to analyse data extracted from policy documents, providing insights into regulatory frameworks and governmental initiatives related to dam infrastructure. In addition to the literature review, the study adopts a case study approach to examine specific instances of dam infrastructure provision in rural Zimbabwe. Case studies provided valuable insights into practical experiences and real-world implementations, complementing the theoretical perspectives derived from the literature review. The methodology employedin the study includes data collection through an extensive literature review and analysis of policy documents related to rural planning in Zimbabwe. In addition, qualitative textual analysis of relevant documents and reports was conducted to reveal underlying narratives and power dynamics.

FINDINGS

The findings of the study provide insights into the effectiveness of dam infrastructure provision in rural Africa, including its impact on water access,

agricultural productivity and energy security. Key findings include the identification of best practices, lessons learned and areas for improvement in future development projects. Dam construction projects are associated with both positive and negative effects. Apart from agricultural benefits, dam infrastructure is associated with more economic gains. These include the creation of employment in various sectors that dam the construction opens avenues to. With the construction of dams, non-farming activities also gain momentum primarily due to tourism, thereby expanding the economic domains in rural areas.

Dams are associated with the destruction of some cultural benchmarks, for instance, the removal of tombs or places of worship. Such cultural assets are difficult to replace, hence infrastructural development that comes in the form of dam construction, develops negative attitudes in local communities which are affected in this manner. As such, the construction of dams has caused grievances for some rural residents who have lost properties, jobs and land due to expropriation. Some are promised compensation which does not come on time or is significantly small.

At initial stages, dam construction causes conflicts between rural residents and the constructors. As time moves, the incidents of conflicts dissipate as residents start to benefit adequately from dam construction as it covers their irrigation requirements. Those who would have worked together during dam construction begin to know each other, thereby improving social ties. Belonging to a society with shared values and responsibility increases social cohesion. People work together in creating irrigation channels, enhancing social capital among villagers. The ties between rural inhabitants become stronger, thereby increasing solidarity between rural inhabitants. There is, however, inequity in the distribution of resources due to some spatial factors like the distance of the inhabitants from the dam. Dwellers near the dam benefit more in terms of the amount of water available for their crops, the compensation that they are given and what they reap from tourism. As such there is unequal distribution of gains from dam infrastructure. The greater the distance, the lower the gains. Gains are more concentrated in the core areas; thus, more state attention is given to those near the dam.

Overall, dam construction reduces migration to nearby towns. Malek *et al.* (2017:193) states,

> Settlement in a village depends on agriculture that depends on water, so the water from the dam keeps the residents in the villages.

This shows that dams store water which farmers use to irrigate crops, thereby generating livelihoods for them. As such, people are motivated to carry out their farming activities locally, not leaving their rural homes in search of greener pastures in urban areas. The new improved conditions that usually emerge in the villages due to irrigation water, give people an interest in agricultural activities. Construction of dams change people's mind-sets, turning the rural area into a good place to stay. Migration trends are also affected due to reverse migration caused by tourist attraction as dams increase the aesthetic value of the villages. Tourists come for fishing, boat cruising and other recreation activities.

CASE 1: BUI DAM IN GHANA

Commissioned on Ghana's Black Volta River, the 444-km^2 Bui Dam is a major infrastructure project (Tang *et al.*, 2019). Before the Kufuor administration accepted a 2005 "unsolicited bid" from Sinohydro, a Chinese state-owned hydro-engineering business, the project faced political and economic obstacles despite being initially hailed as a solution to the nation's energy needs. Funding for the project, anticipated to cost US$624 million, came mainly from external loans from the Chinese government and China's Exim Bank, with the remaining amount coming from the Ghanaian government (*ibid*.).

Proponents of the Bui Dam's project contend that the project would "modernise" Ghanaians living in rural areas, reflecting Ghana's reliance on Chinese investment for economic development (*ibid.*). But building the dam had significant negative effects on the environment and society, especially for the nearby villages. Although a Relocation Planning Framework (RPF) and Environmental and Social Impact Assessment (ESIA) were carried out, deficiencies in these evaluations were discovered during the relocation procedure. The RPF estimated damages for things like land and crops and suggested compensation. It did not, however, address the wider social and

economic effects of relocation. Disruptions to established authority structures resulted in unequal decision-making power distribution among those who relocated. Furthermore, local fishermen suffered from increased competition for resources brought about by the inflow of migrants with fishing experience.

The construction of the dam worsened poverty in the area and perpetuated pre-existing inequities, despite promises of bettering lives through relocation. Though presented as helpful and scientific, development procedures frequently ignore power dynamics and neglect to address the underlying structural problems that cause poverty (Agyei-Mensah, 2017). In addition, the local land users experienced food insecurity because of the dam's effects on land use. Relocation to less productive terrain resulted in a drop in crop production which made livelihood issues worse for the impacted communities (Mitchell, 2002). To build the dam, the state acquired land from customary authorities through eminent domain powers (Environmental Resources Management, 2007). While resettled households received compensation, Jama community members affected by direct land appropriation faced uncertainty regarding compensation. Losses of subsistence and cash crops further compounded the challenges faced by affected communities.

In conclusion, the Bui Dam project in Ghana exemplifies the complex socio-economic and environmental challenges associated with dam infrastructure provision in rural Africa. Despite promises of modernisation and economic development, the project has underscored the importance of comprehensive impact assessments, equitable compensation mechanisms and inclusive decision-making processes to mitigate adverse effects on local communities.

CASE 2: MEROWE DAM IN SUDAN

The Merowe region lies in the northern state of Sudan. It has a varied terrain that includes highlands, flat desert and hills. The climate is mostly desert dry. The region has always been regarded as uninhabitable, except for the lush strip of land around the Nile River (Abdullah *et al.*, 2020). Significant changes have occurred in this area because of the construction of the Merowe Dam, with both beneficial and negative effects on the communities living upstream and downstream of the dam.

People in the Merowe region resided in little farming villages on islands and close to the banks of the Nile before the Merowe Dam was built (Bosshard, 2007). The building of the dam was a turning point for these communities because it brought with it changes in water flow that affected downstream local ecosystems, farming productivity and fishing activities (Power *et al.*, 1996; Lessard *et al.*, 2003). Cultivation has faced difficulties because of this change in water dynamics, especially regarding irrigation and the availability of water for cultivation.

The Merowe Dam's socioeconomic effects go beyond how farming is affected directly. Any alteration in the socioeconomic dynamics of upstream and downstream communities has the potential to have a significant impact on people's livelihoods and the general evolution of humanity (Welzel *et al.*, 2003). Building the dam was intended to alleviate the region's lack of electrical supply and create institutional infrastructure that would improve agricultural output (McDonald *et al.*, 2009). The local economy has benefited from the availability of infrastructure and energy, especially in the agricultural and other sectors. However, issues with irrigation, land size and product quality still exist (Agrawala *et al.*, 2003; Varma *et al.*, 2014).

A junction of developments in the social, cultural, environmental and economic spheres is represented by the Merowe Dam in Sudan's Merowe region. Even while institutional infrastructure and the availability of power have significantly improved, challenges in agriculture still exist, especially regarding irrigation and modernisation. Comprehending the perspectives and encounters of local populations is important in formulating enduring approaches to tackle these obstacles and optimise the advantages of providing dam infrastructure in rural Africa.

CASE 3: NECKARTAL DAM IN NAMIBIA

The Neckartal Dam, completed in 2019, stands as a monumental feat of engineering nestled amidst the arid desert landscape of southern Namibia. As the largest dam in the country and one of the largest in desert regions worldwide, its construction marked a significant milestone in the region's development. Built on the Fish River oasis, the dam's primary purpose is to facilitate irrigation, supporting a vast 5 000-hectare scheme nearby. The

construction of the Neckartal Dam brought forth a myriad of opportunities and challenges, profoundly impacting both the environment and local communities. On one hand, it promised economic revitalisation, job creation and agricultural development. On the other, it posed threats to existing ecohydrology, altering habitats, disrupting migratory routes and affecting flora and fauna. The story of the Neckartal Dam is not just one of engineering prowess, but also of community development. Thousands of individuals from nearby villages and towns were employed, stimulating the local economy and fostering entrepreneurship. The influx of workers catalysed the establishment of new businesses, restaurants and services, breathing new life into the City of Keetmanshoop, located approximately 40 km from the dam.

However, despite its potential for economic growth, the dam's construction also brought about negative impacts. Habitat alteration, water quality concerns, erosion and disruption of fish migration patterns are among the environmental challenges associated with large-scale dam projects. Moreover, the socio-cultural fabric of local communities may undergo significant changes, including displacement and loss of cultural heritage. One glaring issue highlighted by the Neckartal Dam case is the apparent lack of proper planning and foresight in maximising the dam's benefits. Despite massive investments, the government's failure to immediately capitalise on the infrastructure's potential represents a missed opportunity. The delay in reaping economic rewards underscores the importance of strategic planning and efficient utilisation of resources.

Moving forward, there are various avenues for harnessing the Neckartal Dam's potential. Beyond irrigation, the dam could serve as a tourist destination, akin to Victoria Falls in Zimbabwe, attracting visitors to witness its grandeur during flooding seasons. Investment in tourism infrastructure, such as hotels and recreational facilities, could further enhance its appeal. Moreover, the dam holds promise for hydroelectric power generation, offering a sustainable energy source that could reduce reliance on imports and pave the way for affordable electricity access. By tapping into these opportunities, Namibia can strive towards greater self-sufficiency and sustainability across various sectors, from agriculture to energy production.

DISCUSSION

The results of this research provide insight into complex effects of providing dam infrastructure in rural Africa, with a specific emphasis on the following areas: economic development, cultural ramifications, social dynamics, water availability, agricultural production and migratory patterns. Policy-makers, development organisations and local people must comprehend these effects to plan and carry out future dam construction projects efficiently. The substantial benefits of dam infrastructure for rural economic growth and agricultural output are among the study's main conclusions. Dams supply the necessary water for irrigation, increasing crop yields and sustaining lives in agriculture (Abdullah *et al.*, 2020). Furthermore, by generating jobs in the building and associated industries, the construction of dams boosts economic activity. The development of tourism around dam sites further contributes to economic growth by diversifying local economies and creating employment opportunities in hospitality and recreation industries. Dam construction projects do, however, come with drawbacks, mainly in terms of uprooting communities and disturbing cultural heritage. When places of worship and cultural icons are removed, the local populace may get resentful and file complaints about their properties being taken, receiving insufficient pay, or having their land taken. It is necessary to meaningfully engage impacted communities throughout the project lifetime and consider the cultural value of affected places to address these concerns. Moreover, conflicts between rural residents and dam constructors often arise during the initial stages of construction but tend to diminish over time as communities begin to reap the benefits of dam infrastructure. Improved access to water for irrigation fosters collaboration among villagers, strengthening social ties and enhancing social cohesion. However, it is essential to acknowledge the inequities in resource distribution, with residents closer to the dam benefiting more than those farther away. Efforts to mitigate these disparities may involve targeted interventions to ensure equitable access to water, compensation and economic opportunities for all affected communities. Furthermore, the construction of dams significantly affects the patterns of migration in rural regions. Dams encourage people to stay in their villages by supplying dependable water resources for farming which lowers migration to neighbouring towns and metropolitan areas. The enhanced living conditions and economic opportunities brought about by irrigation and tourism activities connected to

dam infrastructure, are the driving forces behind this phenomenon, known as reverse migration. As a result, dams help to maintain rural communities and customs in addition to sustaining local livelihoods. Hydraulic infrastructure development, particularly the construction of dams, plays a crucial role in shaping and expanding state power (Akhter, 2015)

Although dams have enormous potential for growth and sustainability, to optimise positive effects and reduce negative ones, their construction must be governed by the principles of justice, cultural sensitivity and community involvement. To ensure that the needs and ambitions of all stakeholders are sufficiently met, inclusive and participatory methods to dam construction should be given top priority in future research and policy initiatives. Maher *et al.* (2019) emphasise that community acceptance of dam projects can be fostered through well-planned CSR strategies. The socioeconomic and environmental issues surrounding the development of dam infrastructure in rural Africa are brought to light by the case studies of the Merowe Dam in Sudan and the Bui Dam in Ghana. These case studies highlight the significance of participatory decision-making processes, fair pay structures and thorough impact evaluations in addressing several issues that local communities face.

In Ghana, the Bui Dam project had a substantial detrimental impact on the environment and society, especially on neighbouring villages, despite claims of modernisation and economic growth. The dependence on Chinese investment for economic growth resulted in subpar effect evaluations and insufficient payment to impacted populations. Due to changes in land use and crop production, local land users experienced food insecurity and difficulties supporting themselves during the dam's construction, worsening poverty and maintaining already-existing disparities. In addition, the use of eminent domain to acquire land sparked questions about the rights of impacted communities, underscoring the necessity of open and equitable procedures for both land purchase and compensation. Despite the emphasis on partnership and participation in rural development policies, there remains a significant gap between policy decisions and the social realities experienced by rural residents (Langille *et al.*, 2008; Shortall and Warner, 2010).

Similarly, populations upstream and downstream have seen both positive and negative repercussions from the construction of the Merowe Dam in Sudan. Infrastructure and energy availability have helped the local economy grow, but there are still issues in agriculture, especially regarding irrigation and land productivity. The productivity of farming and fishing has been affected by changes in water dynamics which influences the livelihoods of populations that depend on these resources. Furthermore, the dam's socioeconomic effects highlight how critical it is to comprehend local viewpoints and experiences to address persistent issues and maximise the advantages of dam infrastructure provision.

These case studies show how the construction of dams in rural Africa has far-reaching effects that go beyond the projects' original goals. They emphasise the necessity of adopting comprehensive strategies that consider social justice, environmental sustainability and community involvement at every stage of the project's lifecycle. The identification of possible risks and possibilities can be aided by incorporating local knowledge and viewpoints into decision-making processes which will ultimately result in more inclusive and sustainable development results. The Merowe Dam in Sudan and the Bui Dam in Ghana serve as examples of how crucial it is to incorporate social, economic, cultural and environmental factors into the construction of dam infrastructure in rural Africa. Through tackling the obstacles and possibilities linked to these initiatives, governments, development organisations and nearby communities can collaborate to establish more robust and fair development routes.

CONCLUSION AND RECOMMENDATIONS

The study draws attention to the factors that surround the development of dam infrastructure in rural Africa. Although dams have a great deal of promise to improve energy security, agricultural productivity, economic development and water access, they also pose difficult environmental, cultural and socioeconomic problems. The Merowe Dam in Sudan and the Bui Dam in Ghana serve as case studies that highlight the significance of thorough impact assessments, just compensation plans and inclusive decision-making procedures in addressing the complex effects of dam building on nearby people. Based on the findings of the study, the following policy recommendations are proposed to guide future dam infrastructure provision in rural Africa:

- Prior to the construction of dam projects, thorough impact assessments should be conducted to evaluate potential social, economic, cultural and environmental effects on local communities. These assessments should involve meaningful engagement with affected stakeholders and incorporate local knowledge and perspectives.
- Equitable Compensation Mechanisms. Adequate compensation mechanisms should be established to address the negative impacts of dam construction, including loss of land, livelihoods and cultural heritage. Compensation should be fair, transparent and inclusive, considering the needs and aspirations of affected communities.
- Decision-making processes related to dam construction should be inclusive and participatory, involving affected communities, local authorities and relevant stakeholders. Meaningful consultation and collaboration can help ensure that the interests of all parties are considered and addressed throughout the project lifecycle.
- Environmental Sustainability. Dam projects should prioritise environmental sustainability, including measures to mitigate negative impacts on ecosystems, biodiversity and water quality. This may involve implementing effective environmental management plans, habitat restoration initiatives and biodiversity conservation efforts.
- Investments in capacity-building and community development programmes can empower local communities to actively participate in and benefit from dam infrastructure provision. These programmes may include training in sustainable agriculture practices, small business development and natural resource management.

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