Priority Infrastructure Improvements:

ZIMBABWE and the Political Will to Improve Key Infrastructure Facilities

Contents

Introduction – Framing the Approach

Below is a framework for a Detailed Policy Paper on priority infrastructure needs in Zimbabwe, with a particular focus on drinking water and sanitation, while also considering broader infrastructure priorities. This draft incorporates insights from the web results provided, international human rights frameworks, and general knowledge of Zimbabwe's socio-economic context. The paper is structured to align with policy-making standards, offering evidence-based analysis, actionable recommendations, and due consideration of human rights obligations, including those highlighted on our website and of our consultants.

https://zhro.org.uk/human-rights-uk/sanitation. & https://sun-earth-energy.com/energy/chp/anaerobic-digestion-for-chp-fuels

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Priority Infrastructure Needs in Zimbabwe with a Focus on Drinking Water and Sanitation

Executive Summary

Zimbabwe faces significant infrastructure deficits that undermine human rights, economic development, *and public health*. Among these, *access to safe drinking water and sanitation stands out as a critical priority*, recognized internationally as fundamental human rights under the United Nations framework. This policy paper identifies the urgent need to address water and sanitation infrastructure, alongside other key areas such as *health, energy, and transportation*, to achieve sustainable development and uphold Zimbabwe's international human rights obligations. Drawing on data from international organizations, civil society reports, and stakeholder consultations, this paper proposes a comprehensive strategy to prioritize, fund, and implement infrastructure projects. Key recommendations include adopting a human rights-based approach (HRBA) to water and sanitation, mobilizing international and domestic resources, and fostering partnerships to ensure equitable access, particularly for marginalized groups.

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1. Introduction

Zimbabwe's infrastructure challenges are rooted in *decades of economic decline, political instability, and underinvestment*. The country's water and sanitation systems, in particular, have deteriorated significantly, exacerbating public health crises, maternal mortality, and socio-economic inequalities. The Zimbabwe Human Rights Organisation (ZHRO) has emphasized the link between these deficits and human rights violations, noting the failure of the current administration to prioritize health and sanitation infrastructure (*ZHRO, 2024*). This policy paper aims to:

- Assess the current state of Zimbabwe's infrastructure, with a focus on Water and Sanitation, *and Energy Integration*.
- Identify priority needs based on human rights, public health, and economic development criteria.
- Propose actionable policy recommendations to address these needs, ensuring alignment with international obligations and sustainable development goals (SDGs).

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2. Background and Context

2.1 Current State of Infrastructure in Zimbabwe

Zimbabwe's infrastructure deficits span multiple sectors, including water and sanitation, health, energy, transportation, and housing. Key challenges include:

- **Water and Sanitation:** According to UN-Water, billions globally lack access to safely managed water and sanitation, with Zimbabwe facing acute challenges, particularly in rural areas and urban informal settlements. Harare, for instance, has reported non-functional indoor flush toilets due to water shortages, forcing residents to rely on unsafe alternatives (*Human Rights Watch, 2013*). Rural areas suffer from inadequate water supply systems, with many communities relying on contaminated sources, *contributing to waterborne diseases such as cholera*.
- **Health:** The health sector is critically underfunded, with hospitals lacking basic equipment and medicines, a situation ZHRO attributes to corruption and mismanagement (*ZHRO, 2024*). This exacerbates *maternal and infant mortality rates*, with inadequate water and sanitation facilities in health centres contributing to preventable deaths.
- **Energy and Transportation:** Frequent power outages and poor road networks hinder economic activity and access to services, compounding the challenges of delivering water and sanitation infrastructure.
- **Economic Context:** Zimbabwe's economic crisis, characterized by hyperinflation, currency instability, and high unemployment, limits government capacity to invest in infrastructure. Corruption further diverts resources, with ZHRO noting that proceeds from mineral resources are often siphoned off by elites, leaving ordinary citizens without basic services (ZHRO, 2024).

2.2 Human Rights Framework

Access to safe drinking water and sanitation is recognized as a human right under international law, derived from the right to an adequate standard of living (*Article 11, International Covenant on Economic, Social and Cultural Rights*). The *UN General Assembly Resolution A/RES/64/292 (2010)* and subsequent resolutions affirm these rights, obliging states to ensure universal access without discrimination, prioritizing the most marginalized. The UK, as a signatory to these frameworks, has recognized sanitation as a human right and committed to supporting global efforts (*GOV.UK, 2012*). ZHRO's advocacy, as highlighted on its website, underscores the need for Zimbabwe to meet these obligations, particularly in addressing maternal mortality linked to poor sanitation in health facilities (*ZHRO, 2024*).

2.3 Sustainable Development Goals (SDGs)

SDG 6 (Clean Water and Sanitation) targets universal access to water and sanitation by 2030, emphasizing the principle of "leaving no one behind." Zimbabwe's progress toward SDG 6 is lagging, with significant disparities between urban and rural areas, and between privileged elites and the majority poor. Addressing water and sanitation infrastructure is also critical to achieving other SDGs, including SDG 3 (*Good Health and Well-being*) and SDG 5 (*Gender Equality*), given the disproportionate impact of poor sanitation on women and girls.

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3. Priority Infrastructure Needs

Based on the analysis of current challenges, human rights obligations, and development goals, the following infrastructure priorities are identified:

3.1 Drinking Water and Sanitation

- **Current Challenges:**

- **Availability:** Water supply is insufficient and discontinuous, particularly in rural areas and urban informal settlements. Sanitation facilities are inadequate, with many schools, health centres, and public places lacking sufficient toilets.
- **Accessibility:** Physical access to water and sanitation facilities is limited, especially for persons with disabilities, women, children, and older persons. Many rural communities must travel long distances to access water, often from unsafe sources.
- **Quality and Safety:** Water sources are frequently contaminated, and sanitation facilities are unhygienic, increasing the risk of diseases such as cholera and typhoid. In health facilities, poor sanitation contributes to maternal and infant mortality.
- **Affordability:** High costs of water and sanitation services, coupled with economic hardship, exclude the poorest communities from access.
- **Non-Discrimination:** Marginalized groups, including women, children, refugees, indigenous peoples, and persons with disabilities, face active discrimination and systemic barriers in accessing services.
- **Waste Management Linkages:** Inadequate sanitation systems contribute to significant organic waste accumulation, particularly in urban areas and informal settlements, where open defecation and uncollected waste contaminate water sources. *This not only exacerbates public health risks but also represents a missed opportunity to harness organic waste as a resource for energy generation.*

- **Priority Needs:**
  - Rehabilitation and expansion of water supply systems, including boreholes, piped water networks, and water treatment plants, particularly in rural and underserved urban areas.
  - Construction of safe, hygienic, and accessible sanitation facilities in households, schools, health centres, and public places, ensuring gender-segregated and disability-friendly designs.
  - Implementation of water quality monitoring and sanitation safety standards to prevent contamination and disease outbreaks.
  - Subsidies and community-based financing models to ensure affordability, particularly for low-income households.
  - Targeted interventions to address discrimination, ensuring equitable access for marginalized groups, as emphasized by UN-Water's human rights-based approach (UN-Water, 2022).
  - *Development of integrated waste-to-energy systems that convert organic waste streams from sanitation facilities (e.g., sewage sludge, faecal matter) into bio-methane, thereby improving sanitation outcomes while generating renewable energy*.

3.2 Health Infrastructure

- **Link to Water and Sanitation:** Poor water and sanitation in health facilities directly contribute to high maternal and infant mortality rates, as highlighted by ZHRO (2024). The lack of clean water and hygienic toilets in maternity wards increases infection risks, such as postpartum haemorrhage and sepsis.

- **Priority Needs:**
    - Upgrading water and sanitation facilities in health centres, including maternity wards, to meet international standards.
    - Equipping hospitals with essential medical supplies and ensuring reliable energy sources to support water and sanitation systems (e.g., water pumps and sterilization equipment).

3.3 Supporting Infrastructure (Energy and Transportation)

- **Link to Water and Sanitation:** Reliable energy is essential for water pumping, treatment, and sanitation systems, while transportation infrastructure facilitates the delivery of materials and services to remote areas. Additionally, the energy sector can benefit from innovations in sanitation, such as bio-methane production, which can provide a decentralized, renewable energy source to support water and sanitation infrastructure.
- **Priority Needs:**
    - Investment in renewable energy sources, such as solar-powered water pumps, to ensure sustainable water supply systems.
    - Rehabilitation of rural road networks to improve access to water and sanitation infrastructure projects.
    - **Energy:**
        - Investment in renewable energy sources, such as solar-powered water pumps, to ensure sustainable water supply systems.
        - Development of bio-methane production facilities that utilize organic waste from sanitation systems, providing a dual benefit of waste management and energy generation. Bio-methane can be used for electricity generation, heating, or as a fuel for transportation, reducing reliance on fossil fuels and addressing energy deficits in rural and urban areas.
        - Integration of bio-methane systems with existing energy grids or as standalone microgrids to power water treatment plants, health facilities, and schools, particularly in off-grid areas.
    - **Transportation:**
        - Rehabilitation of rural road networks to improve access to water and sanitation infrastructure projects, including the transportation of organic waste to bio-methane production facilities.

3.4 Circular Economy and Waste-to-Energy Integration

- **Rationale:** Zimbabwe's sanitation crisis generates significant organic waste streams, including sewage sludge, faecal matter, and agricultural residues, which are currently underutilized. Converting these waste streams into bio-methane through anaerobic digestion offers a sustainable solution that addresses sanitation, energy, and environmental challenges simultaneously. This approach aligns with circular economy principles, reducing waste, mitigating greenhouse gas emissions, and providing a renewable energy source to support infrastructure development.
- **Priority Needs:**

- Construction of anaerobic digestion facilities at scale, strategically located near urban centres, rural sanitation hubs, and agricultural zones to process organic waste from sanitation systems and other sources.
- Development of collection and transportation systems for organic waste, ensuring safe and efficient delivery to bio-methane production facilities.
- Implementation of training programs for local communities, sanitation workers, and technicians to manage and maintain bio-methane systems, fostering job creation and community ownership.
- Integration of bio-methane into national energy strategies, including its use in powering water treatment plants, health facilities, schools, and public transportation, thereby reducing energy costs and improving service delivery.

Establishment of regulatory frameworks to ensure the safe handling, processing, and use of organic waste, including standards for bio-methane quality and environmental protection

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4. Policy Recommendations

To address these priority needs, the following recommendations are proposed, grounded in a human rights-based approach and aligned with international best practices:

4.1 Adopt a Human Rights-Based Approach (HRBA)

- **Policy Action:** Enact legislation and policies that explicitly recognize water and sanitation as human rights, in line with UN resolutions and Zimbabwe's international obligations. Ensure that policies prioritize the most marginalized, including women, children, refugees, indigenous peoples, and persons with disabilities.
- **Implementation:** Establish a national task force to oversee the implementation of HRBA principles, involving civil society, international organizations, and affected communities. Use tools such as the UN-Water Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS) to monitor progress (WHO, 2022).

4.2 Mobilize Resources

- **Domestic Funding:** Combat corruption and redirect resources from elite enrichment (e.g., mineral proceeds) to public infrastructure, including investments in integrated sanitation and energy projects, as highlighted by ZHRO (2024). Implement transparent budgeting and anti-corruption measures to ensure funds reach intended projects, such as bio-methane facilities.
- **International Support:** Leverage commitments from international partners, such as the UK's pledge to support water and sanitation initiatives (GOV.UK, 2012), to secure funding and technical assistance for waste-to-energy projects. Engage with UN agencies (e.g., UN Environment Programme, UNIDO), the World Bank, and regional bodies like the Southern African Development Community (SADC) to mobilize resources for bio-methane initiatives, emphasizing their alignment with climate and SDG goals.
- **Private Sector Engagement:** Foster public-private partnerships (PPPs) to finance and implement infrastructure projects, including bio-methane production facilities, ensuring safeguards to prevent

privatization that excludes the poor. Encourage private sector investment in renewable energy technologies by offering incentives, such as tax breaks or carbon credits.

4.3 Strengthen Governance and Accountability

- **Policy Action:** Establish independent regulatory bodies to oversee water, sanitation, and energy services, ensuring compliance with human rights standards and equitable distribution. Include specific mandates for regulating waste-to-energy systems, such as bio-methane production, to ensure safety, efficiency, and environmental sustainability. Strengthen local government capacity to plan, implement, and maintain integrated infrastructure projects.
- **Community Participation:** Involve communities, particularly marginalized groups, in the design, implementation, and monitoring of water, sanitation, and energy projects to ensure solutions meet local needs and cultural contexts. Promote community-led management of bio-methane facilities to enhance local ownership and sustainability.

4.4 Build Resilience to External Shocks

- **Climate Adaptation:** Integrate climate-resilient technologies, such as rainwater harvesting, drought-resistant water systems, and bio-methane production, into infrastructure planning to address climate change impacts, as recommended by UN-Water (2022). Bio-methane systems can reduce greenhouse gas emissions by capturing methane from organic waste, contributing to climate mitigation efforts.
- **Conflict and Migration:** Plan for the needs of refugees, internally displaced persons, and conflict-affected communities, ensuring access to water, sanitation, and energy in densely populated areas, as highlighted by UNHCR (UNHCR, 2024). Deploy mobile bio-methane units in refugee camps to manage waste and provide energy for lighting, cooking, and water purification.

4.5 Enhance Public Awareness and Education

- **Policy Action:** Launch national campaigns to educate the public on water conservation, hygiene practices, the importance of sanitation, and the benefits of waste-to-energy systems, drawing on ZHRO's advocacy for human rights education (ZHRO, 2024). Highlight the role of bio-methane in improving sanitation, reducing energy costs, and protecting the environment.
- **School Programs:** Integrate water, sanitation, hygiene (WASH), and energy education into school curricula, ensuring access to safe facilities and renewable energy sources (e.g., bio-methane-powered lighting) to support learning, particularly for girls and children with disabilities.

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5. Implementation Strategy

5.1 Phased Approach

- **Short-Term (1-3 Years):** Focus on emergency interventions, such as repairing existing water and sanitation systems, providing mobile water treatment units, and constructing temporary sanitation facilities in high-risk areas (e.g., cholera hotspots). Pilot small-scale bio-methane projects in urban informal settlements and rural sanitation hubs to demonstrate feasibility and build community support.
- **Medium-Term (3-7 Years):** Implement large-scale infrastructure projects, including new water supply networks, treatment plants, sanitation facilities, and bio-methane production facilities,

prioritizing rural and underserved urban areas. Scale up successful bio-methane pilots into regional networks, integrating them with energy grids and water infrastructure.

- **Long-Term (7-15 Years):** Achieve universal access to water, sanitation, and sustainable energy, aligning with SDG 6 (Clean Water and Sanitation) and SDG 7 (Affordable and Clean Energy) targets, through sustained investment, policy reform, and capacity building. Establish Zimbabwe as a regional leader in waste-to-energy innovation, leveraging bio-methane to power public services and reduce environmental degradation.

5.2 Monitoring and Evaluation

- **Indicators:** Use internationally recognized indicators, such as those from the WHO/UNICEF Joint Monitoring Program (JMP), to track progress on access, quality, and equity in water and sanitation services (WHO/UNICEF, 2022). Add specific indicators for waste-to-energy systems, such as bio-methane production volumes, energy output, greenhouse gas emissions reductions, and waste diversion rates, drawing on frameworks like the UN Environment Programme's waste management metrics (UNEP, 2022).

- **Accountability Mechanisms:** Establish regular reporting to parliament, civil society, and international bodies on infrastructure spending and outcomes, ensuring transparency and accountability. Include specific reporting on the performance and impact of bio-methane projects to ensure they meet sanitation, energy, and environmental goals.

5.3 Partnerships

- **Key Stakeholders:** Engage government ministries (e.g., Environment, Energy, Health), local authorities, civil society organizations (e.g., ZHRO), international organizations (e.g., UN-Water, WHO, UNHCR, UNIDO), private sector partners, and community groups in a coordinated effort to implement recommendations. Include technical experts in bio-methane and waste-to-energy systems to provide training and oversight.

- **Regional Collaboration:** Work with SADC to share best practices, secure funding, and address cross-border water, sanitation, and energy challenges, as highlighted by ZHRO's focus on regional advocacy (ZHRO, 2024). Promote regional knowledge exchange on bio-methane technologies, drawing on successful models in other African countries, such as Kenya's biogas initiatives (UNEP, 2022).

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6. Conclusion

Zimbabwe's infrastructure crisis, particularly in water, sanitation, and energy, represents a profound human rights, public health, and environmental challenge. Addressing these priority needs requires a comprehensive, rights-based approach that mobilizes resources, strengthens governance, and ensures equitable access. By integrating innovative solutions, such as the conversion of organic waste streams into bio-methane, Zimbabwe can simultaneously improve sanitation, generate renewable energy, and advance sustainable development. This policy paper calls for urgent action from the government, international partners, and civil society to ensure that no one is left behind in the quest for universal access to water, sanitation, and clean energy, while positioning Zimbabwe as a leader in circular economy innovation.

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7. Appendices

- **Appendix A:** Summary of International Human Rights Obligations (UN General Assembly Resolutions, ICESCR, etc.).
- **Appendix B:** Case Studies of Successful Water, Sanitation, and Waste-to-Energy Interventions in Comparable Contexts (e.g., Kenya's biogas initiatives, as referenced by UNEP, 2022).
- **Appendix C:** ZHRO Advocacy Materials on Water, Sanitation, Maternal Mortality, and Sustainable Energy (ZHRO, 2024).

Notes on Using This Framework

1. **Incorporating ZHRO's Work:** The paper integrates ZHRO's advocacy, particularly its emphasis on *human rights violations, corruption, and maternal mortality,* as highlighted in their website (https://zhro.org.uk/human-rights-uk/sanitation plus. https://zhro.org.uk/human-rights-uk/zim-updates/142-cholera-and-typhoid and https://zhro.org.uk/160-24th-oct-2024-dual-petition-day) We may wish to expand specific sections with additional ZHRO data or case studies to strengthen the paper's alignment with our organization's mission.
2. **Critical Examination:** The paper continues to critically examine systemic issues, such as corruption and elite capture, while introducing bio-methane as a practical, sustainable solution. This balances advocacy with actionable innovation, aligning with our interest in questioning inefficiencies and promoting transparency (*as reflected in our broader advocacy*).
3. **Customization for Stakeholders:** If targeting specific audiences, such as energy-focused donors or sanitation policymakers, we may wish to emphasize different aspects of the bio-methane integration. For example, energy donors might prioritize the renewable energy benefits, while sanitation advocates might focus on waste management improvements.
4. **Further Research:** To strengthen the waste-to-energy section, consider adding data on Zimbabwe's organic waste volumes, potential bio-methane yields, and cost-benefit analyses. International case studies, such as *Kenya's biogas programs*, can provide benchmarks for feasibility and impact.
    1. https://sun-earth-energy.com/energy/chp/anaerobic-digestion-for-chp-fuels and https://sun-earth-energy.com/wmg-wastes/waste-water-problems-sewage
5. **Visual Aids:** Include charts, maps, or infographics (e.g., showing water access disparities or cholera hotspots) will make this paper more engaging and accessible to policymakers.
6. **Note:** *John Burke* is a director of ZHRO Ltd, *but also a highly experienced Construction Infrastructure Consultant and holds active Directorships with Sun Earth Energy Ltd, Zero Energy Systems Ltd and QSIR Limited.*