State of Environment Report for Ezulwini Town Council

Validation Session

10 December 2025

Ezulwini MUNICIPALITY

Discover Happiness

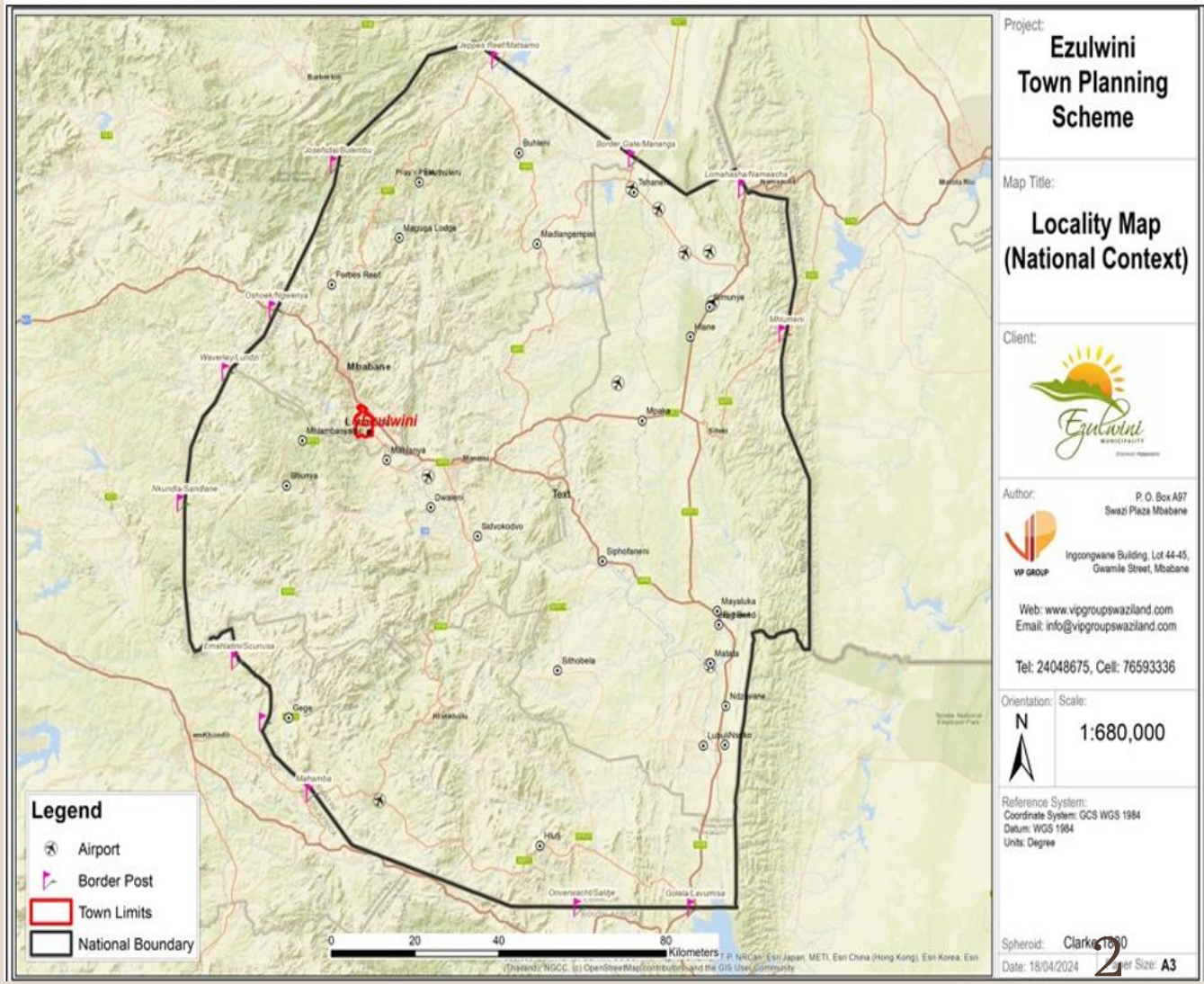
Introduction

Purpose & Context of the SOER

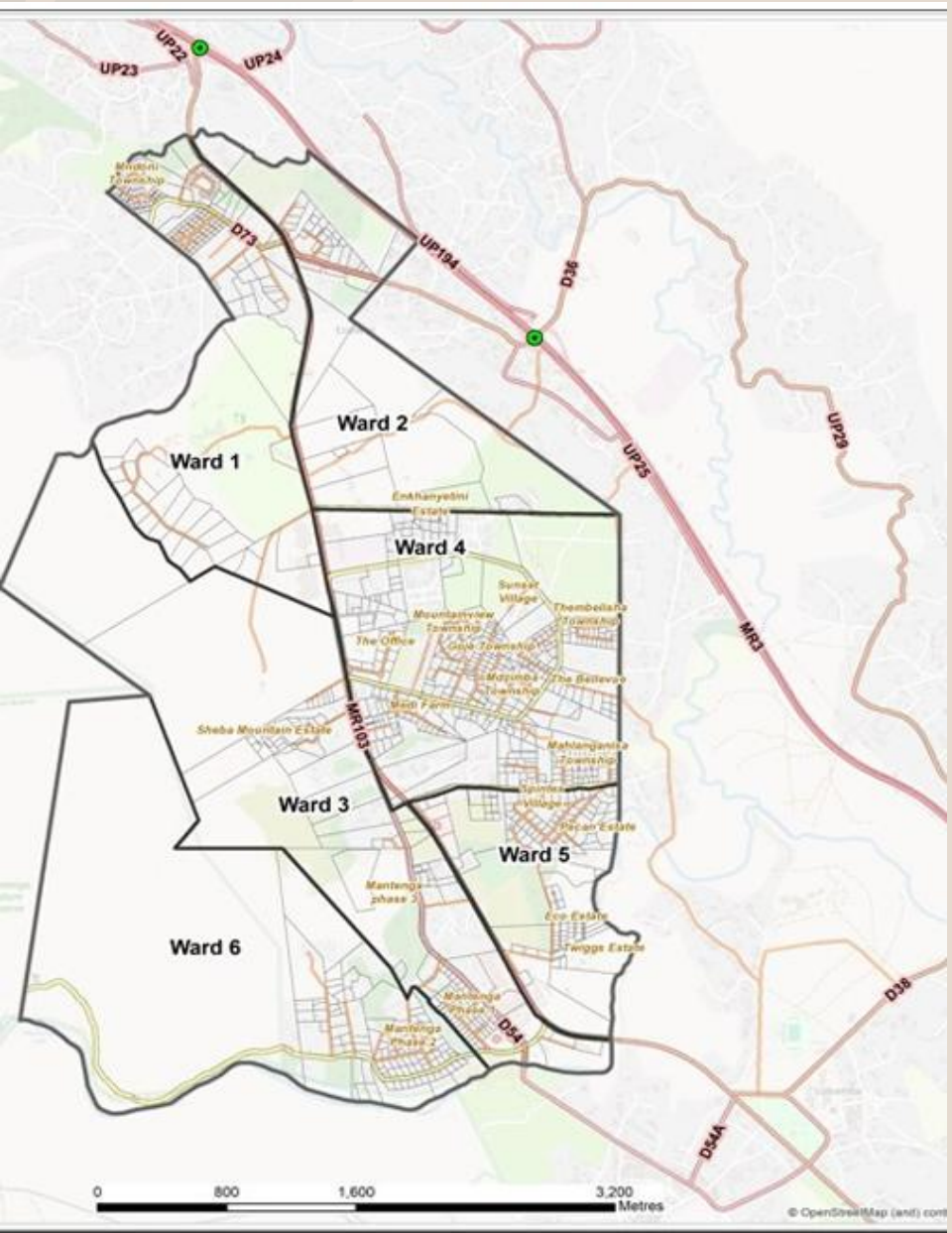
Regulatory Mandate: Eswatini's Environment Management Act (2002) requires regular State of Environment Reports. National assessments have NOT adequately addressed unique challenges of rapidly urbanizing towns like Ezulwini.

Strategic Response: Ezulwini's SOER (September 2025) fills a critical gap by providing town-level environmental analysis aligned with international frameworks:

- 2030 Agenda for Sustainable Development (SDGs)
- Paris Agreement (Climate)
- Convention on Biological Diversity (Biodiversity)



Introduction



Geographic & Demographic Context

- **Location:** Ezulwini Valley, Hhohho Region; strategically nestled between Mbabane (administrative capital) and Manzini (commercial hub)
- **Land Area:** ~1,720 hectares; bordered by Mdzimba & Lugogo Mountains; Lusushwana & Mkhondolwane rivers as natural boundaries
- **Population:** ~2,800 (2024); rapid urbanization trajectory with 100+ approved developments (2019-2024)
- **Governance:** Councillors; 6 wards; 6 departmental functions; Integrated Development Plan (IDP) 2019-2049 and SDG 11 (Sustainable Cities)
- **Natural Assets:** A portion of Mlilwane Wildlife Sanctuary (4,500ha), Mantenga Nature Reserve (700ha); recognized tourism hub with high ecological value

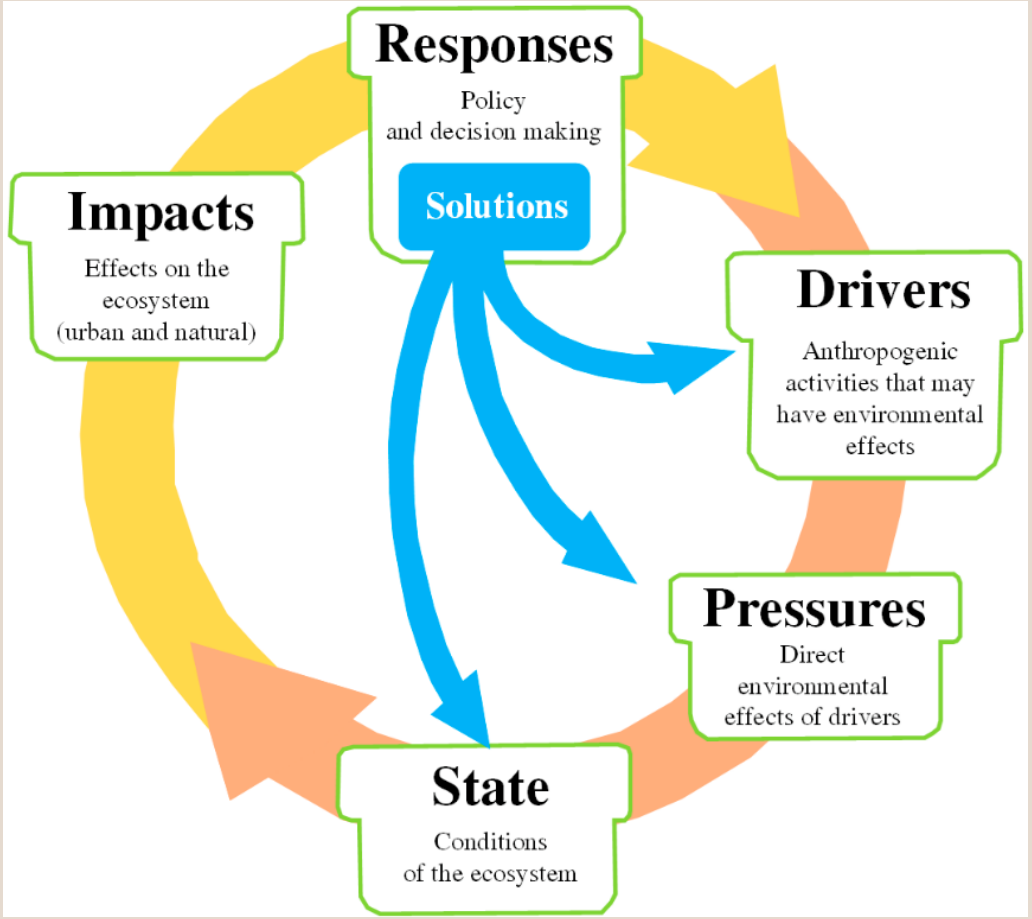
Approach & Methodology

Core Framework: The report adopts the **DPSIR (Drivers-Pressures-State-Impacts-Responses)** framework to establish causal relationships between socio-economic activities and environmental outcomes. This ensures a holistic analysis rather than just a status update.

Data Collection: A rigorous mixed-methods approach was used to ensure robustness:

- **Surveys:** 100 randomly sampled residents provided localized insights.
- **Consultations:** Structured interviews with key entities (Eswatini Environment Authority, Ministry of Health, EWSC, ENTC).
- **Triangulation:** Findings were cross-verified by combining survey results, institutional records, and scientific studies.

State Evaluation: Environmental "state" was explicitly classified as **Improving**, **Declining**, or **Stagnant** based on trend analysis (longitudinal comparison) and threshold assessments (benchmarking against national standards).



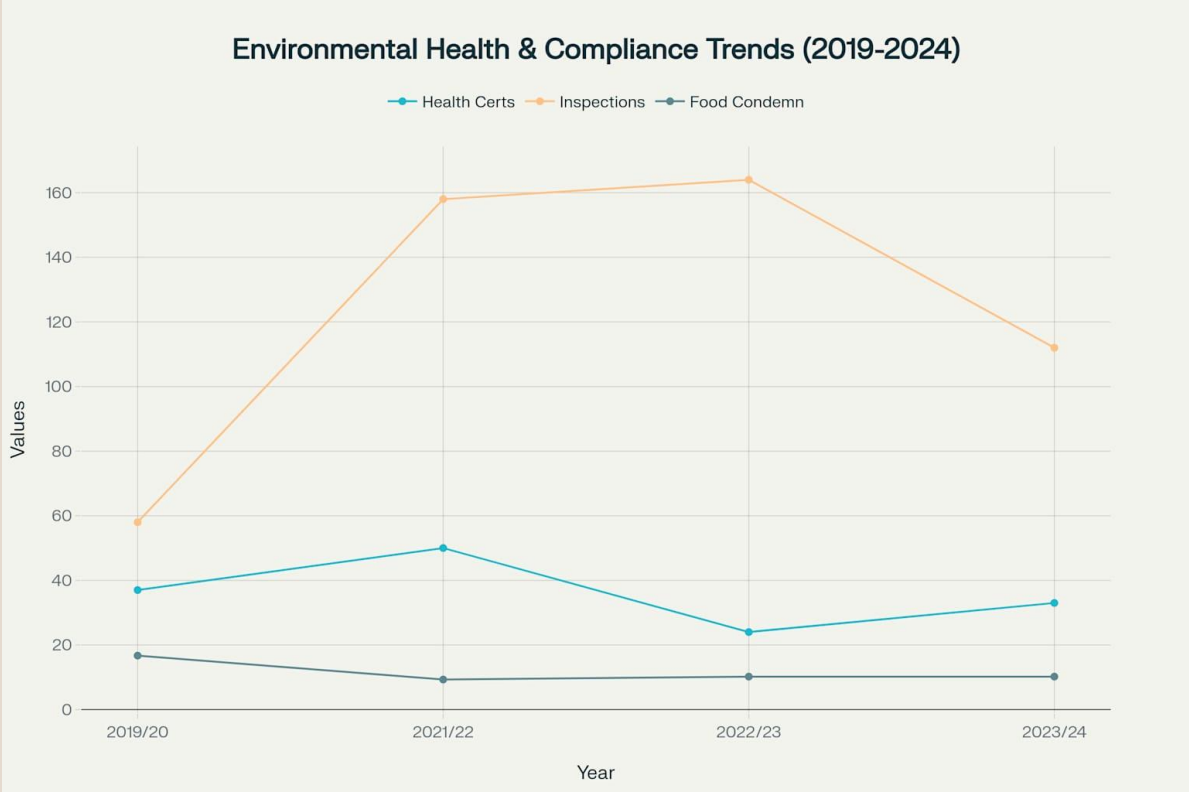
Approach & Methodology – Indicator Framework

Thematic Area	Key Indicators Tracked
Environmental Governance	Budget allocations, public participation rates, business compliance rates
Waste Management	Generation/collection rates, recycling %, hazardous waste volumes, illegal dumping sites
Freshwater Management	Water quality data (E. coli, turbidity, fluoride), consumption trends, source protection measures
Public Health	Waterborne disease incidence, sanitation coverage, healthcare access, food safety compliance
Land Use	Patterns/changes, green space coverage %, urban development density, population distribution
Biodiversity	Species diversity indices, protected area coverage, invasive species prevalence, habitat fragmentation
Air Quality & Climate	Pollutant levels (if available), GHG emissions, climate impacts, adaptation measures
Energy	Consumption patterns, renewable adoption %, efficiency improvements, electrification rates
Culture & Heritage	Cultural sites inventory, traditional practices documentation, heritage conservation efforts
Social Well-being	Quality of life ratings, social cohesion indices, mental health statistics, crime rates, substance abuse prevalence

Environmental Governance

The State of Environmental Governance is IMPROVING

- Improvement in application of environmental policies and regulations (compliance monitoring 100% for major projects; draft Bylaws pending, ISO 9001 implementation)
- Improved budget allocations
- Improved public participation rates (IDP and Budgets, groups involved in waste separation; schools in waste training)
- Improved stakeholder relationships
- Environmental health compliance of businesses



Environmental Governance

Drivers: Policy frameworks: IDP 70% waste diversion target; quality management system under development; SDG localization; Community-centered programs; Waste Separation at Source; Strategic investments: 85 solar streetlights

Pressures: Rapid urbanization (100+ new developments); Regulatory delays: 11 draft Bylaws awaiting ministerial approval (1-2 year backlog); Limited staffing: 1 Environmental Health Officer + 1 Public Health Officer for PH&E Department; Infrastructure gaps: No municipal laboratory; 23km haul to Matsapha disposal site

Impacts (Positive): Cost savings: E30-40K/month waste disposal vs. E50-60K previously; Community mobilization: Improved environmental awareness: AGM participation; stakeholder engagement

Impacts (Negative): Hazardous waste mishandling; Enforcement gaps: Limited staff despite expanding urban area; Exclusionary engagement: Limited programs for women, youth, people with disabilities

Environmental Governance...cntd

Responses: Waste Separation at Source; Disaster Management Plan; Institutional partnerships: UNDP, EEA collaboration

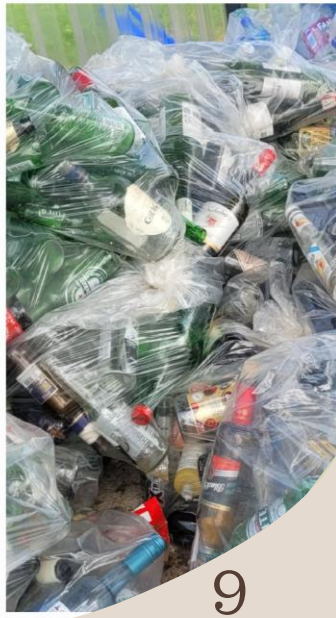
Gaps: Regulatory: 11 Bylaws not yet gazetted; weakens enforcement; Capacity: No municipal lab; Lack of Infrastructure: landfilling; No hazardous waste management system and facilities; No targeted assessments for marginalized groups

Recommendations: Immediate: Expedite Bylaws promulgation (establish Ministry liaison); recruit additional officers; pilot hazardous waste collection; **Medium-term:** Develop Municipal Laboratory; acquire land for MRF; embed climate resilience in planning

Waste Management

The State of Waste Management is IMPROVING

- Improved solid waste collection rates
- Hazardous waste management compliance monitoring Increased recycling rates and waste minimization measures
- Improved wastewater treatment capacity through EWSC Treatment Plant
- Management of Illegal dumping sites (documented in residential and peri-urban zones; shifting hotspots)



Waste Management

Drivers: IDP targets (70% diversion by 2049); Policy alignment: National Solid Waste Management Strategy; Basel Convention (hazardous waste); SDGs 11, 6, 13; Community engagement: Door-to-door campaigns; youth volunteers; stakeholder forums

Pressures: Urban growth: Waste generation +56.7% (2020/21 → 2023/24); peri-urban influx; Financial constraints: 23km haul to Matsapha landfill; weighbridge fees inflate costs; Resource limitations: 2 inspectors for enforcement; no hazardous waste system; Regulatory lag: 11 Bylaws pending promulgation (1-2 years)

Impacts (Positive): Recycling surge: 139% increase in recyclables; cost savings E20-40K/month; Youth employment: volunteers in Waste Separation; improved environmental awareness; Landfill diversion: Reduced municipal burden

Impacts (Negative): Illegal dumping: Peri-urban residents lack facilities; dumping in town + public bins overuse; Hazardous waste mismanagement: Public health: Uncollected waste poses disease vector risks

Waste Management...cntd

Responses: Waste Separation at Source; Regulatory development: 11 Bylaws pending; Infrastructure planning: IDP includes MRF land acquisition + local disposal site development; Enforcement

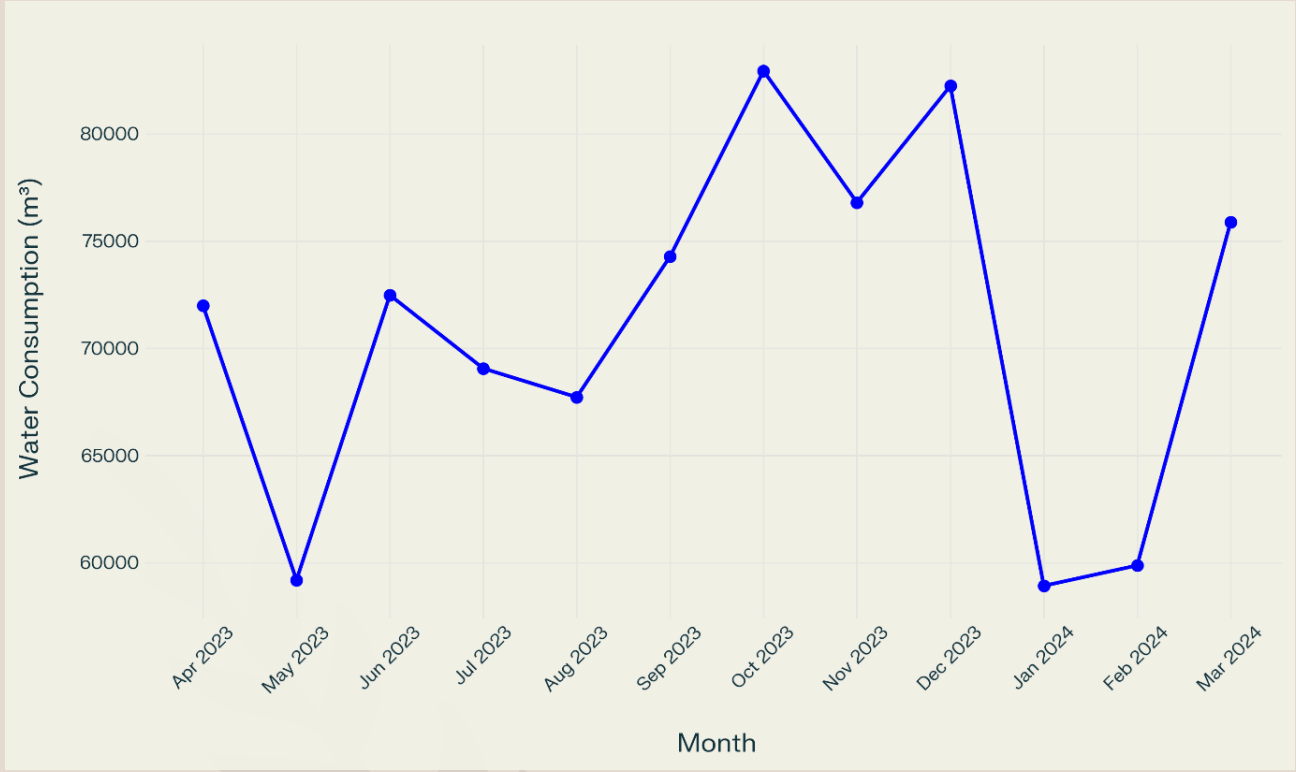
Gaps: Lack of Hazardous waste system: No collection points; no segregation protocol; no disposal partnerships; Human resources: Inadequate PH&E + SHEQ staffing; Regulatory: Bylaws pending promulgation; interim mechanisms needed; Peri-urban integration: Limited waste services outside boundaries; cross-area dumping persistent

Recommendations: Recruit additional Public Health Inspector + Environmental Officer + Disaster Risk Reduction personnel; Establish hazardous waste system; Accelerate Bylaws promulgation via Ministry liaison; Acquire land for MRF + waste disposal site (feasibility studies underway)

Fresh Water Management

The State of Freshwater Management is STAGNATING:

- Available water sources (3 main rivers) and water supply from EWSC
- Water quality monitoring but poor state (E. coli, turbidity, fluoride exceedances in all sources; Cuddle Puddle worst-performing)
- Increasing water consumption rates (59,000-83,000m^3/month; seasonal variation Dec peak)
- Water source protection measures (fencing, surveillance; Bylaws pending for enforcement)



Freshwater Management

Drivers: Infrastructure development: AfDB-funded water/sanitation expansion; National regulatory framework: Water Act 2003; Pollution Control Regulations 2010; EWSC informal partnerships: Treatment plant upgrades; ISO-accredited laboratory

Pressures: Urban development encroaching on wetlands: 33.1% of properties protected via wetland buffers (but disturbance ongoing); Consumption rising: 59,000-83,000m^3/month with seasonal variation; Limited local testing capacity: 2-week testing delays due to lack of laboratory services

Impacts (Positive): Water access expanded; infrastructure future-proofed (10ML/day treatment capacity); EWSC ISO-accredited; continuous monitoring protocols

Impacts (Negative): Water quality contamination: Informal hot springs (Cuddle Puddle); Waterborne disease risk: E. coli contamination; Ecosystem degradation: Wetland loss reducing filtration; increased flooding risks; public health risks; Disease surveillance absent: Waterborne disease tracking not conducted

Freshwater Management ...cntd

Responses: Infrastructure expansion: New 15ML reservoir planned for resilience; Water quality monitoring: Routine testing of key parameters; Source protection: Fencing of vulnerable sources; emergency drills; Smart meters: Water consumption tracking

Gaps: No municipal laboratory (2-week delays in results); Waterborne disease surveillance absent; no tracking system; Wetland protection weak; enforcement limited; Peri-urban source protection lacking; Real-time water quality sensors absent

Recommendations: Invest in municipal laboratory: Cost-effective food + water testing facility; Establish real-time monitoring: Automated water quality sensors at intakes; Strengthen source protection: Accelerate Bylaws for waste/water protection; catchment management; Wetland management: Comprehensive inventory + legal framework for private property wetland preservation; Collaboration with ENTC for management of Cuddle Puddle; Joint strategies with upstream communities

Biodiversity Management

The State of Biodiversity Management is DECLINING:

- Species diversity (endemic flora: *Pterocarpus angolensis* (Kiaat), *Senecio mlilwanensis* (Daisie); rare ground hornbill, blue swallow migrated)
- Protected area coverage (42% municipal land; Mlilwane 4,500ha; Mantenga 700ha)
- Invasive species prevalence (374ha invaded = 22% of total area; Lantana, Eucalyptus, Bugweed dominant)
- Habitat fragmentation (urban development pressuring connectivity; wetland disturbance ongoing)

Biodiversity Management

Drivers: Protected area framework: 42% of municipality under conservation (Flora Protection Act 2001; CBD ratification); Community-based initiatives: ENTC partnership; protected area management; conservation education; International alignment: Convention on Biological Diversity targets

Pressures: Urbanization & habitat fragmentation: 100+ developments; ecosystem connectivity threatened; Invasive species expansion: 374ha invaded (22% of total); Lantana Camara, Eucalyptus, Bugweed, Solanum mauritianum dominant; Wetland disturbance: Urban development encroaching on riparian zones; Limited management resources: Insufficient staffing for invasive species control

Impacts (Positive): 42% land under conservation management; stable antelope/mammal populations in protected areas; Biodiversity hotspot status maintained; ecosystem services intact in reserves; Community education programs; school engagement

Impacts (Negative): Invasive species expansion exceeding control efforts; endemic species isolated; Habitat loss & fragmentation threatening rare species (grey rhebok, oribi); Ecosystem services degradation (invasive species fire risk; erosion; water stress); Bird migration (endangered species leaving area)

Biodiversity Management...cntd

Responses: Protected area management: 42% land under active conservation; Community-based initiatives: Invasive species clearing (12km^2 along MR103); tree planting (85 indigenous trees); Institutional coordination: ENTC partnership; enforcement

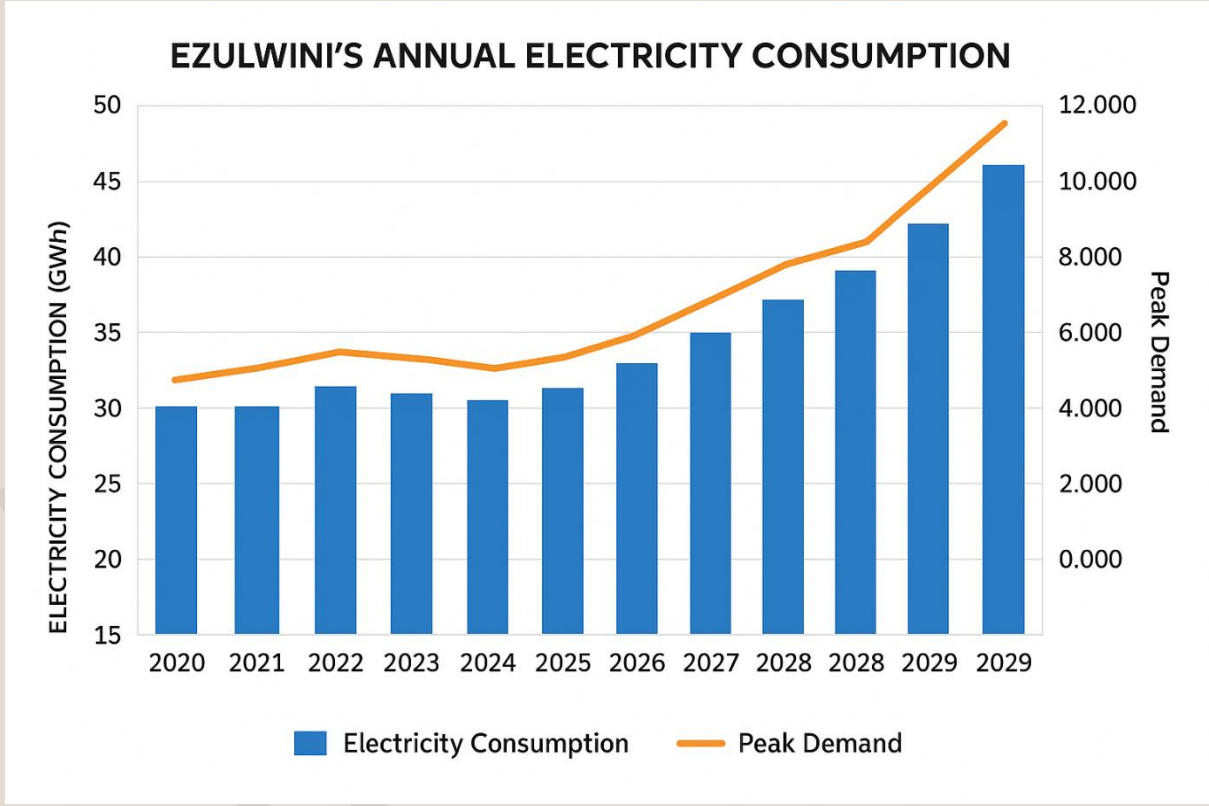
Gaps: Comprehensive biodiversity mapping lacking; Invasive species control underfunded; control pace lags expansion rate; Limited inter-agency coordination; Biodiversity Action Plan lacking; Early warning systems for endemic species decline absent

Recommendations: Conduct comprehensive biodiversity inventory + municipality-wide Biodiversity Action Plan; Increase invasive species control budget + staffing; Establish biodiversity monitoring framework; Strengthen ENTC partnership for rare species protection; Document endemic species migration triggers

Energy Management

The State of Energy Management is IMPROVING

- Improving Renewable energy adoption (~800kW embedded solar PV; 85 solar streetlights; LED retrofits)
- Improvement in Electrification access (near-universal urban coverage)
- Energy efficiency measures (Time-of-Use tariffs; building standards; streetlight upgrades)
- Energy consumption patterns (electricity demand projected +76.7% by 2029; high grid dependency)



Energy Management

Drivers: National renewable energy targets and Eswatini's commitments to low-carbon development; Municipal initiatives: solar streetlights, LED retrofits, and support for embedded solar PV; Cost containment: desire to reduce electricity bills and vulnerability to tariff increases; Reliability concerns: need for more resilient power to support tourism, commerce, and households.

Pressures: Rapid urbanization and economic growth driving up electricity demand; Limited grid infrastructure capacity to absorb a 76.7% increase by 2029; Capital constraints for scaling up municipal-level renewable projects and storage

Impacts: Reduced operational costs for street lighting and some municipal services.; Lower greenhouse gas emissions from street lighting and buildings using LEDs/solar; Continued dependence on the national grid and fossil-fuel-based generation.; Missed opportunities for local energy jobs and value chains if investments lag.

Energy Management...cntd

Responses: Solar streetlight program: Additional 85 new units across residential streets.; LED retrofit program: replacing inefficient lighting in municipal buildings; Time-of-Use (ToU) tariffs and efficiency measures to shift/limit peak consumption.

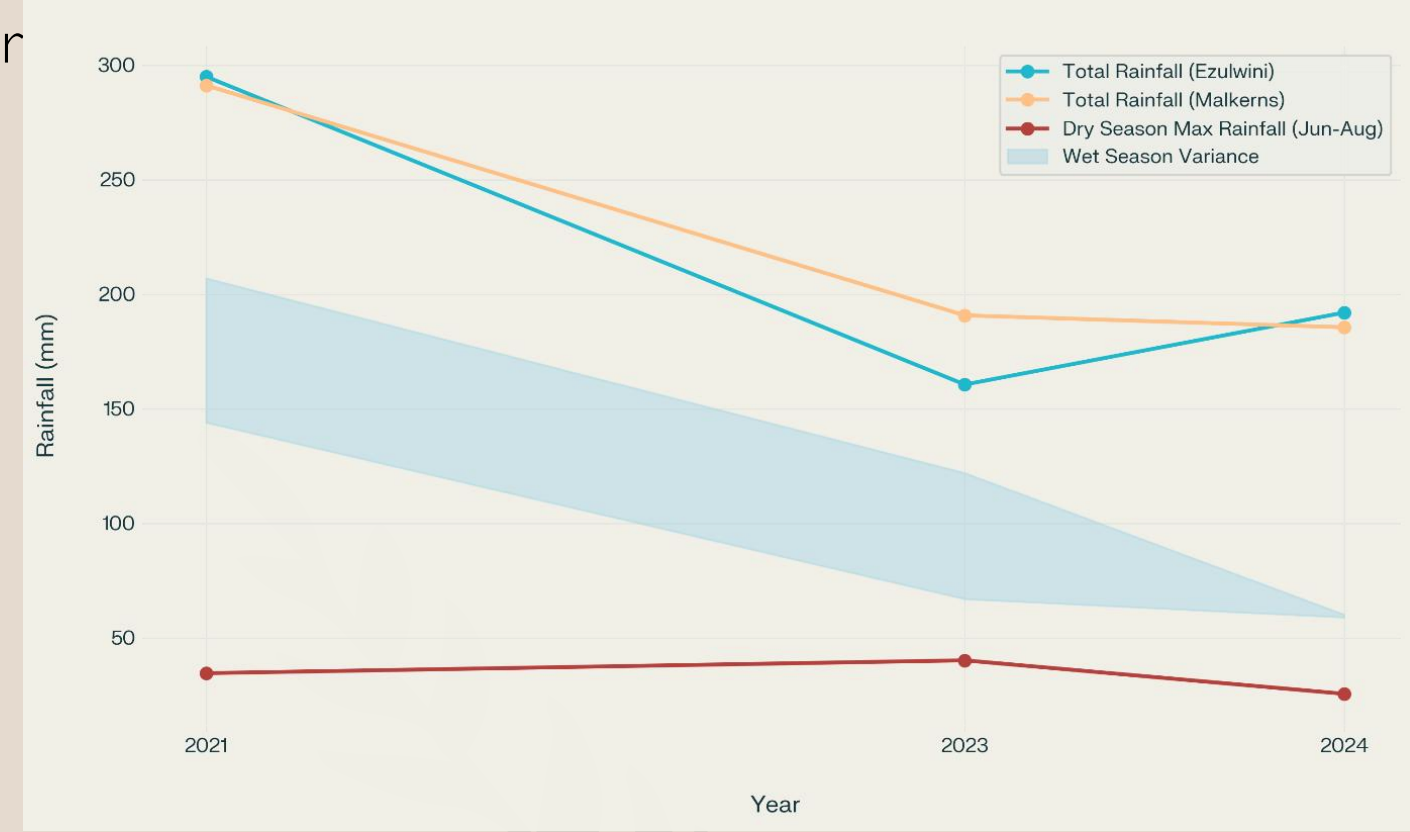
Gaps: Grid capacity upgrades not yet aligned with forecasted 76.7% demand increase.; Limited funding mechanisms for scaling municipal renewables (e.g. green bonds/PPPs); Smart grid/digital metering not fully implemented, limiting demand-side management.

Recommendations: Develop a municipal energy transition plan linked to the IDP and national targets; Pursue battery storage and small-scale microgrid pilots for critical facilities; Work with utilities on a grid-upgrade roadmap to handle projected demand; Expand public–private partnerships for rooftop solar and efficiency retrofits; Introduce or scale up smart metering and demand-side management programs.

Air Quality and Climate Change Management

The State of Air Quality and Climate Change Management is IMPROVING

- Adaptation & mitigation measures (Disaster Risk Management Plan; additional 85 solar streetlights; waste diversion reducing methane)
- Limited climate change impacts even though flooding risk identified; heat stress rising; invasive species drought stress
- Greenhouse gas emissions (waste haul 23km; transport emissions; grid electricity reliance)
- Air pollutant levels (no direct monitoring; assessment needed)



Air Quality and Climate Change Management

Drivers: Disaster Risk Management (DRM) Plan and national climate commitments.; Waste diversion and renewable initiatives, which indirectly reduce emissions; Increasing urbanization, traffic, and construction activity in a confined valley setting; Growth in transport and service sectors associated with tourism and commerce.

Pressures: Transport emissions (NO_x, PM) from growing traffic and daily 23 km waste haul; Construction dust from ongoing developments and infrastructure projects; Open burning and informal practices contributing to particulate pollution; Climate hazards: more intense rainfall events, dry spells, and elevated average temperatures.

Impacts: Potential health impacts from PM and NO_2 exposure, especially for children, elderly, and people with respiratory conditions—currently not measured.; Heat-related stress likely to increase hospital visits and reduce productivity.; Flooding damages roads and disrupts economic activity and access.; Ecosystem impacts: drought stress on vegetation and invasive species dynamics

Air Quality and Climate Change Management

Responses: Development and implementation of a Disaster Risk Management Plan covering floods, fires, and droughts.; Solar streetlighting and embedded PV reducing reliance on high-carbon grid energy.; Waste separation decreasing landfill volumes and methane generation.; Emergency drills and contingency planning with key stakeholders.

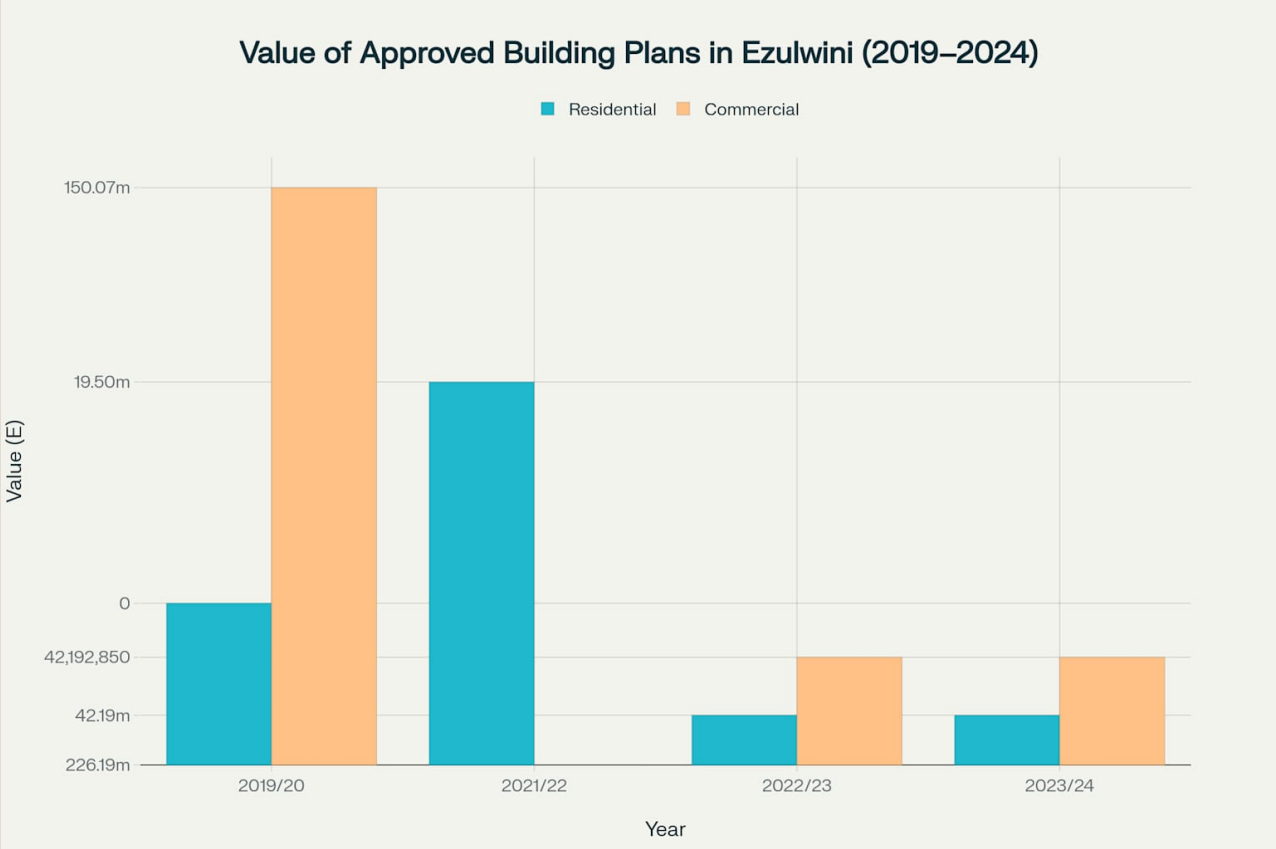
Gaps: No air quality monitoring network; Climate risk mapping incomplete (Limited spatial data on who/what is most exposed (schools, clinics, informal areas).; Wetland and riparian systems not fully protected or restored, reducing natural flood buffering; Disaster management capacity constrained (temporary staffing, limited equipment); Weak linkage between climate data and planning decisions (e.g., building codes, land-use rules).

Recommendations; Establish a basic air quality monitoring network ($PM_{2.5}$, PM_{10}, NO_2) at strategic locations (corridors, schools, town centre); Integrate climate data and risk mapping into town planning and infrastructure design (e.g., flood-resilient roads, drainage); Protect and restore wetlands and riparian buffers as natural flood and heat mitigation; Strengthen the DRM unit: permanent staffing, training, and equipment; Communicate climate and air risks through public awareness campaigns and early warning systems.

Land Use Management

The State of Land Use Management is IMPROVING:

- Land use patterns (60%+ residential; commercial on MR103/D36; mixed-use development)
- Green space coverage (18% conservation areas; Regional Open Space System protecting 33% via wetland buffers)
- Urban development plans with green elements (TPS under review; CMP 2023; IDP 2019-2049)
- Green city initiatives (Additional 85 solar streetlights; indigenous tree planting; ATDC composting pilot)



Land Use Management

Drivers: Strong planning frameworks: IDP 2019-2049; Town Planning Scheme (TPS) under review; Comprehensive Mobility Plan 2023; Economic development: increase in private investment (2019-2024); 100+ approved developments;

Pressures: Urban growth; Limited public land; scarcity for public facilities/amenities; Development potentially outpacing services: Infrastructure maintenance backlog; Tourism demand: Commercial development pressure

Impacts (Positive): Economic growth: LED programs; investment appreciation; Infrastructure upgrades: Roads, street lighting, stormwater systems; Urban greening: 85 indigenous trees planted; green corridors established

Impacts (Negative): Wetland encroachment: 33.1% buffers protective but disturbance ongoing; Habitat fragmentation: Urban development reducing ecosystem connectivity; Informal settlement pressures: Limited affordable land; public space scarcity; Infrastructure maintenance

Land Use Management..cntd

Responses: Zoning enforcement: 100% environmental monitoring of projects; Green space development: Tree planting; ROSS protection; PELUM community gardens; Mobility planning: CMP 2023 for transport resilience

Gaps: Public land acquisition limited; Green space underutilized for community benefit; Infrastructure maintenance resources insufficient; Accurate data for planning sparse

Recommendations: Strategic public land acquisition: Partner with iNgwenyama for Swazi Nation Land conversion; Green space activation: Municipal parks + recreational facilities; Infrastructure resilience: Asset management + maintenance budget increase

Culture and Heritage

The State of culture and heritage is STAGNATING:

- Cultural sites inventory (documented; facing degradation from urbanization)
- Traditional practices & knowledge (declining; loss of intangible heritage)
- Cultural events & participation (commemorative events; limited youth engagement)
- Heritage conservation efforts (pilot projects; UNESCO conventions ratified nationally; enforcement weak)

Culture and Heritage

Drivers: National policy framework: Flora Protection Act 2001; cultural inventory initiatives

Pressures: Urbanization & globalization threatening physical monuments + intangible practices, Limited documentation; weak enforcement; low community participation; Budget constraints; institutional capacity gaps

Impacts: Loss of traditional knowledge; site degradation; Intangible heritage disappearing; younger generations disconnected

Responses: Cultural inventories: Documentation initiated; Capacity-building workshops; pilot conservation projects; Institutional framework via ENTC

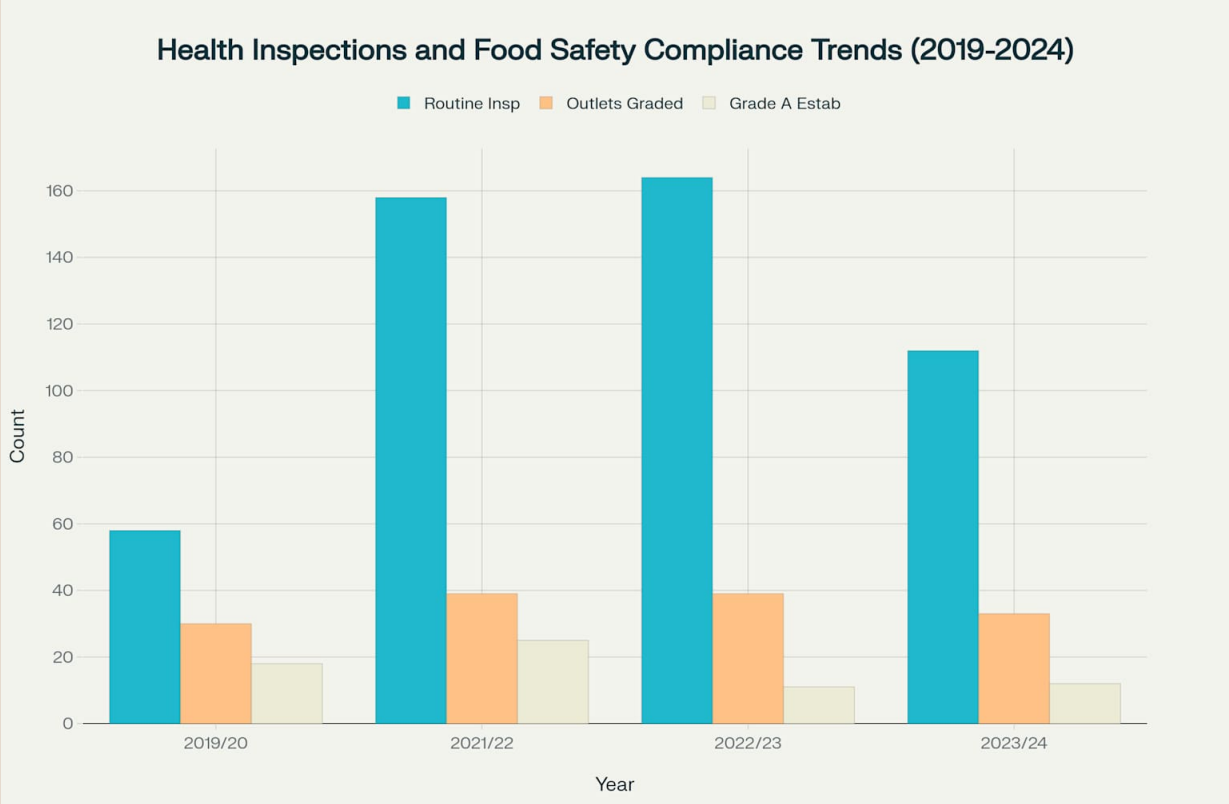
Gaps: Targeted funding lacking; Documentation incomplete; enforcement weak; Community participation minimal; youth disengagement high

Recommendations: Secure targeted funding for cultural site preservation; Strengthen documentation + enforcement mechanisms; Engage youth via cultural programming; Develop heritage conservation incentives

Public Health Management

The State of Public Health Management is STAGNATING:

- Sanitation coverage (100%)
- Health & safety incidences (rabies vaccination; zero major incidents reported)
- Healthcare facility access (improved, but affordability an issue)
- Waterborne disease incidence (3.6% of surveyed households report illness; data tracking absent)
- Air pollution-related issues (no sensors; assessment required)



Public Health Management

Drivers: National and international policy frameworks; community engagement; partnerships

Pressures: Population growth + peri-urban waste influx; Limited inspectors: 2 for all environmental compliance; No laboratory capacity; water quality violations; disease vector potential high

Impacts (Positive): Food safety compliance high; disease prevention improving; Waste diversion reducing breeding sites

Impacts (Negative): Waterborne disease untracked; air quality risks unmeasured; E. coli contamination unmonitored; data gaps limit response

Public Health Management..cntd

Responses: Routine inspections (health, food, environment); Vaccination programs + home-based care; Waste diversion reducing vectors

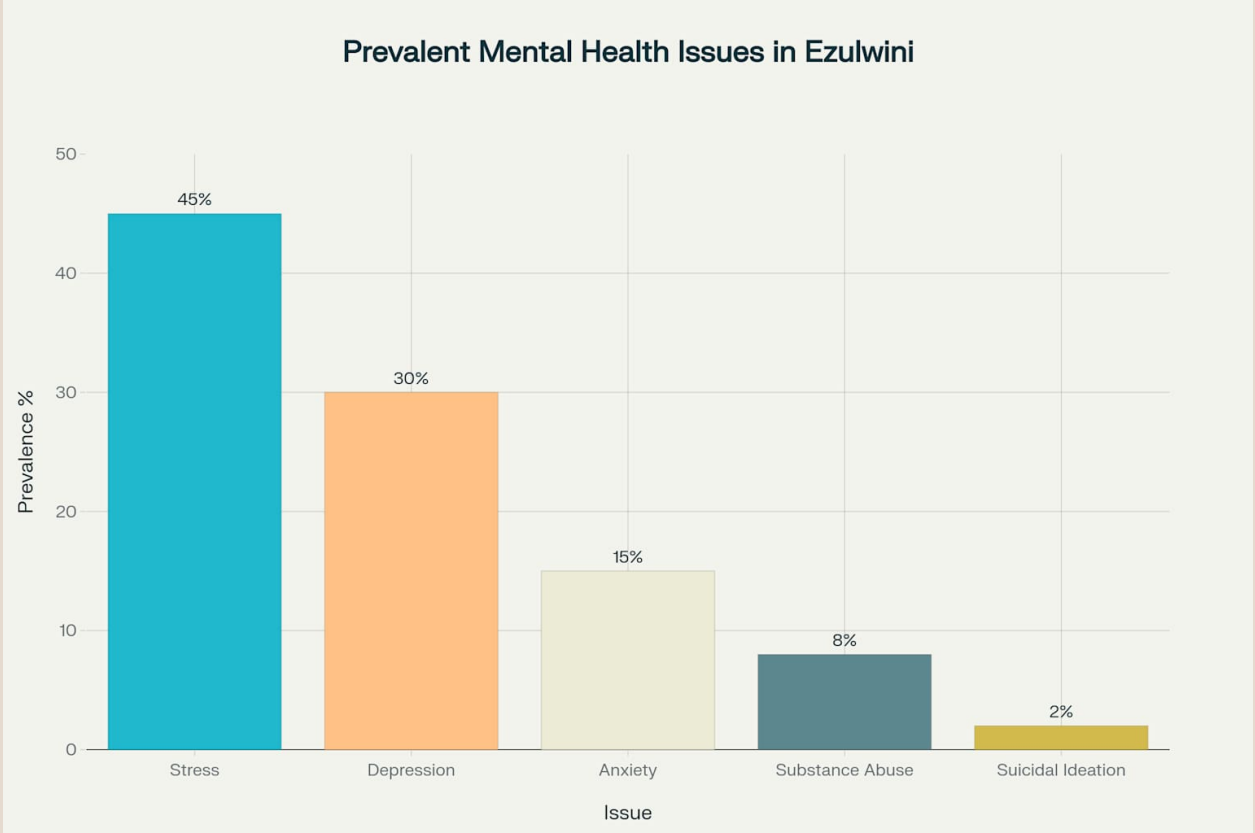
Gaps: No laboratory capacity for water/food testing; Disease surveillance lacking (waterborne, foodborne tracking absent); enforcement (2 inspectors for 1,720ha); Air monitoring absent

Recommendations: Establish municipal laboratory capacity; Implement waterborne disease surveillance system; Deploy air quality monitoring sensors; Recruit additional inspectors; capacity building

Social Welfare and Cross Cutting Issues

The State of Social Welfare and Cross Cutting Issues is STAGNATING

- Quality of life ratings (average; weak social cohesion)
- Social cohesion & community engagement (35% cohesion rating; community watch programs emerging)
- Recreational facility access (limited; planned municipal parks)
- Mental health & well-being (persistent challenges; no clinics; substance abuse rising)
- Crime rates & types (gradually declining; GBV remains concern; burglary, theft prevalent)
- Social pathologies (substance abuse rising; social isolation; domestic violence documented)
- Gender equality in environmental decision-making (limited women's participation)
- Youth involvement (UNDP youth programs; 20 waste volunteers; unemployment high)
- Environmental education & awareness (4 schools trained; media campaigns; limited reach)



Social Welfare/Cross Cutting Issues

Drivers: IDP social programs; community watch initiatives; wellness planning; SDG 3 & 11 alignment; local government commitment

Pressures: Economic disparities; unemployment (especially youth); urbanization; service delivery gaps; Limited recreational infrastructure; mental health stigma; Rising substance abuse; social isolation

Impacts (Positive): Crime gradually declining; property investment; community engagement in planning; Community watch programs emerging; wellness initiatives

Impacts (Negative): Average quality of life; weak cohesion; limited recreation; Mental health untreated; substance abuse; social isolation; Equity gaps: Limited services for marginalized groups

Social Welfare/Cross Cutting Issues..cntd

Responses: Neighborhood watch programs; Planned wellness initiatives + GBV campaigns; Home-based care support

Gaps: No mental health facilities; social services fragmented; No municipal recreational spaces; Youth unemployment high; limited integration programs

Recommendations: Establish mental health clinics; social services integration; Develop municipal parks + recreational facilities; Youth employment programs; entrepreneurship support

Thank you

Interlink PROFESSIONALS

BUSINESS SYSTEMS I STRATEGY I PROJECTS I RISK I SHERQ I ENVIRONMENT I WASTE

Cell: (+268) 76186006 Email: interlinkprofessionals@thansygroup.com Postal: P.O. Box 602 Matsapha, M202, Eswatini