Assessing the Effectiveness of Policing Strategies in Addressing Drug Abuse in Climate-Vulnerable Urban Areas: A Case of Budiriro Township, Harare

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ABSTRACT

Drug abuse is an escalating public security challenge in climate-vulnerable peri-urban settlements across sub-Saharan Africa, yet the effectiveness of deployed policing strategies in such contexts remains empirically under-evaluated. This study assessed the effectiveness of policing strategies in addressing drug abuse in Budiriro Township, a flood-prone, low-income suburb in south-western Harare, Zimbabwe. Grounded in Problem-Oriented Policing (POP) theory (Goldstein, 1990) and a pragmatic philosophical orientation, the research employed a descriptive mixed-methods design with a comparative component contrasting climate-stressed and relatively stable sub-localities within Budiriro Township. Structured questionnaire data were collected from 130 respondents drawn using stratified systematic random sampling from ward registers, with sample size determined using Yamane's (1967) formula applied to the verified adult population of Budiriro Township. This was complemented by 13 key informant interviews (KIIs) and 4 focus group discussions (FGDs). SPSS Version 28 facilitated Pearson correlation analysis and descriptive statistics; Braun and Clarke's (2019) six-phase thematic analysis guided qualitative interpretation. Findings reveal that reactive enforcement correlates weakly with improved community safety ($r=0.29$, $p<0.05$), a correlation that, while statistically significant, explains only 8.4% of outcome variance and should not be interpreted as evidence of meaningful causal effect. By contrast, climate-aware targeted policing yields the strongest associations with positive outcomes ($r=0.74$, $p<0.001$), explaining 54.8% of outcome variance. Climate-induced social disorganisation ($r=0.74$), livelihood loss ($r=0.69$), and flood frequency ($r=0.54$) all demonstrate statistically significant positive relationships with drug abuse severity ($p<0.01$). A convergent parallel synthesis of quantitative and qualitative findings within a unified climate-policing-drug nexus framework confirms that structural climate vulnerability mediates the relationship between policing strategy type and community safety outcomes. The study calls for integration of climate vulnerability analysis into community policing frameworks, cross-sectoral governance reform, and investment in evidence-based rehabilitation pathways.

Keywords: policing strategies, drug abuse, climate vulnerability, Budiriro, Harare, Problem-Oriented Policing, community policing, mixed methods, Zimbabwe.

INTRODUCTION

Drug abuse has emerged as one of the most destabilising public security challenges confronting urban communities in the twenty-first century, with its burden falling disproportionately on populations residing in climate-vulnerable settlements of the Global South (UNODC, 2023a; Cianconi, Betrò and Janiri, 2020; Mares and Moffett, 2019). Every person residing in climate-stressed urban areas is already experiencing the compounding effects of environmental degradation and social disorganisation (Sellers, 2016). Zadawa and Omran (2020) elaborate that climate change is now a threat to the totality of human security. The IPCC (2021)

affirms that Africa bears the heaviest burden because of structural poverty, limited adaptive capacity, fiscal constraints, and highly variable climatic conditions.

Globally, the UNODC estimates that approximately 296 million people used drugs in 2021, a 23 per cent increase over the preceding decade, with sub-Saharan African cities recording the steepest growth trajectories (UNODC, 2023a). Agriculture, economic productivity, and social cohesion in Africa are simultaneously under assault from climate change (Moyo, 2010; Baiyegunhi, 2018; Dzvimbo, Matamanda, Mawonde and Magijani, 2022), creating overlapping vulnerabilities that predispose marginalised urban youth to substance abuse as a maladaptive coping response (Cianconi, Betrò and Janiri, 2020; Obradovich et al., 2018). Okojo-Iweala (2020) and Sova (2017) testify that Africa's GDP will be reduced by 7 per cent by 2100 due to climate change, a trajectory that directly amplifies livelihood insecurity in peri-urban communities.

Within Southern Africa, the SADC Drug Control Programme has formally acknowledged climate-related displacement as an emerging structural driver of substance abuse (SADC, 2021). The Zimbabwe Vulnerability Assessment Committee (ZimVAC, 2022) attests that a significant proportion of households in peri-urban Harare are ill-equipped to manage compounding climate stress and social disorder. The ZRP and related agencies document rising drug-related incidents in Harare's peri-urban areas, with Budiriro Township consistently among the most affected localities (ZRP, 2022; ZIMSTAT, 2022). Budiriro, with approximately 95,000 residents, high youth unemployment (68%), inadequate drainage, and recurrent flooding, exemplifies the climate-security-drug nexus this study interrogates (Harare City Council, 2023; Ministry of Health and Child Care, 2021; Mutandwa and Gadzirayi, 2019). However, the township is internally differentiated: Budiriro 3 and 4 experience severe recurrent flooding while Budiriro 1 and 2 are comparatively more stable. This spatial heterogeneity provides an internally comparative structure within a single site, generating comparative evidence while preserving contextual coherence.

This study addresses a critical methodological gap in prior research: the absence of comparative design in single-site climate-policing studies, which limits causal inference. By comparing sub-localities within Budiriro that differ systematically in climate vulnerability exposure, the study generates stronger, longitudinally anchored propositions about the climate-drug relationship than purely cross-sectional designs allow. If the drivers behind this nexus are not rigorously interrogated and policing strategies remain uncritically deployed, colossal community safety losses will persist, with severity increasing as climate change intensifies (Moniruzzaman, 2015; Nhantumbo, 2020). The study is guided by the following specific research objectives:

- To examine the nature, scope, and climate-vulnerability context of drug abuse in Budiriro Township, Harare.
- To assess the effectiveness of current ZRP policing strategies in addressing drug abuse in Budiriro Township.
- To investigate the relationship between climate-induced socioeconomic stressors and drug abuse severity in Budiriro Township.
- To develop evidence-based recommendations for integrating climate-sensitive approaches into community policing frameworks in Harare's peri-urban areas.

LITERATURE REVIEW

Global Overview: Climate Change, Urbanisation, and Drug Abuse

The relationship between environmental stress and substance use disorders has attracted increasing scholarly attention since the IPCC's sixth assessment report foregrounded the mental health and social cohesion implications of climate change in urban settings (IPCC, 2021; Hayes, Blashki and Wiseman, 2018). Climate change, operating through cascading impacts on food security, livelihoods, and psychological wellbeing, creates structural conditions predisposing urban populations to heightened drug abuse vulnerability (Mares and

Moffett, 2019; Berry, Waite and Bullen, 2018; Obradovich et al., 2018). The UNODC (2023a) identifies urban informal settlements as epicentres of drug market expansion, noting that poor governance, weakened social capital, and climate-related displacement collectively erode the effectiveness of conventional policing. Goldstein's (1990) foundational POP framework advocates addressing the underlying conditions generating crime rather than merely responding to symptoms, a position resonant with the multi-causal nature of drug abuse in climate-stressed cities (Eck and Spelman, 2018; Braga and Weisburd, 2022). The World Health Organization (2022) affirms that climate-resilient urban governance is a prerequisite for effective management of substance use burdens.

Regional Outlook: Southern Africa and the SADC Context

Within the SADC region, drug abuse trends are shaped by porous borders, urban poverty, climate-induced migration, and proliferation of synthetic substances (SADC, 2021; African Union Commission, 2022). The SADC Drug Observatory recorded a 41 per cent rise in drug-related arrests across member states between 2018 and 2022. Studies from South Africa's Cape Flats demonstrate that community policing forums reduce drug-related crime only when livelihood insecurity is addressed alongside enforcement (Seekings and Nattrass, 2018; Altbeker, 2019). Research from Mozambique's Beira, post-Cyclone Idai, documented a 67 per cent spike in drug abuse incidents persisting over 18 months, emphasising the temporal climate-policing-drug nexus (Nhantumbo, 2020). In Zambia, Kampata and Mwansa (2020) found significantly higher drug use among flood-displaced urban youth. Chitongo et al. (2019) show that climate-induced displacement in Chimanimani, Zimbabwe, generated social disorganisation mirroring drug abuse risk patterns. Across the region, inadequate integration of climate vulnerability data into policing strategy constitutes a systemic governance deficit (Baker, 2016; Nyikahadzoi and Mhlanga, 2021; Froestad and Shearing, 2020).

Zimbabwe and Harare: Drug Governance in a Climate-Stressed Capital

Zimbabwe's drug abuse governance framework spans the Criminal Law (Codification and Reform) Act [Chapter 9:23], the Dangerous Drugs Act [Chapter 15:02], and the revised ZRP Community Policing Strategy (2018). The National Drug Master Plan 2021-2025 provides policy direction, yet systematic evaluation of policing effectiveness in climate-vulnerable contexts remains absent from peer-reviewed scholarship (Ministry of Health and Child Care, 2021; Mutandwa and Gadzirayi, 2019).

ZimVAC (2022) attests that 69 per cent of households in Zimbabwe's most climate-stressed areas live below the poverty datum line, structural conditions Baiyegunhi (2018) identifies as determinant of maladaptive coping. Mlambo and Zhou (2021) found flooding-related displacement in Harare's southern suburbs correlates positively with social disorganisation and elevated drug use. Gwimbi (2019) documented that climate-related income shocks in periurban Harare associate significantly with substance use as a coping behaviour.

Theoretical Framework: Problem-Oriented Policing

This study adopts Problem-Oriented Policing (POP) as its singular theoretical lens, developed by Goldstein (1990) and operationalised through the SARA model (Scanning, Analysis, Response, and Assessment) (Eck and Spelman, 2018). POP reorients policing from incident response to systematic problem resolution, requiring engagement with the full spectrum of social, environmental, and structural factors producing crime (Scott and Kirby, 2012; Weisburd et al., 2021; Bowling, Reiner and Sheptycki, 2019). Braga and Weisburd's (2022) meta-analysis of 65 POP evaluations found problem-oriented interventions produce effect sizes two to three times larger than reactive enforcement.

Mazerolle and Ransley (2019) demonstrate that POP combined with multi-agency partnerships achieves durable reductions in drug market activity. Social disorganisation theory, originally Shaw and McKay (1942), updated for climate-stress contexts by Sampson, Raudenbush and Earls (2019), provides a complementary explanatory strand: climate-induced shocks eroding community cohesion systematically predict elevated drug abuse.

Conceptual Framework

Drawing synthetically from Goldstein (1990), Mares and Moffett (2019), Chirisa et al. (2020), Mlambo and Zhou (2021), and Baiyegunhi (2018), the study operationalises a framework in which climate vulnerability, comprising flood exposure, livelihood insecurity, housing instability, and social disorganisation, functions as an independent structural variable mediating the relationship between policing strategy type (reactive versus community-integrated versus climate-sensitive) and drug abuse outcomes. Critically, this framework posits that the correlation between climate variables and drug abuse severity becomes more interpretively robust when examined comparatively across sub-localities with systematically different vulnerability profiles. This framework governed instrument design, sampling, and analysis throughout.

METHODOLOGY

Study Area

Budiriro Township in Harare's south-western periphery was selected purposively based on its documented characteristics: approximately 95,000 residents across five sections; severe recurrent flooding from inadequate stormwater drainage; youth unemployment of 68 per cent; limited health and recreational infrastructure; and consistently high drug-related police activity (ZRP, 2022; Harare City Council, 2023; ZIMSTAT, 2022). Critically, the township's internal heterogeneity supports comparative design: Budiriro 3 and 4 experience severe annual flooding, while Budiriro 1 and 2 have comparatively better drainage infrastructure and lower flood frequency. This spatial stratification, documented in Harare City Council (2023) engineering assessments, provided the comparative structure for sub-locality analysis.

Research Design and Philosophical Orientation

The research adopted a descriptive mixed-methods design with an embedded comparative component, employing a convergent parallel approach in which qualitative and quantitative data were collected simultaneously and synthesised within a unified analytical framework at the interpretation stage (Creswell and Plano Clark, 2018). The comparative component contrasts high-vulnerability and moderate-vulnerability sub-localities within Budiriro Township. This within-site comparative approach enables the study to distinguish between climate-related and non-climate-related drivers of drug abuse with greater confidence than a single-context study, consistent with methodological guidance from Shadish, Cook and Campbell (2002).

The pragmatic philosophical paradigm, as articulated by Dewey (1938) and developed by Creswell and Creswell (2018), accepts that complex social phenomena are best approached through complementary deployment of quantitative and qualitative methods (Morgan, 2020; Teddlie and Tashakkori, 2021). Its 'what works' orientation aligns directly with this study's applied policy-reform objectives.

Population and Sample Size

The study population comprised Budiriro residents aged 18 years and above (n=approximately 57,000 adults, based on ZIMSTAT, 2022 age-structure projections), ZRP officers, ward councillors, social workers, and healthcare personnel.

The quantitative sample size of 130 questionnaire respondents was determined using Yamane's (1967) simplified formula: n = N / (1 + N(e)^2), where N = 57,000 (adult population) and e = 0.087 (acceptable margin of error at 95% confidence), yielding n = 57,000 / (1 + 57,000 x 0.0076) = 130.8, rounded to 130. This exceeds Cohen, Manion and Morrison's (2007) minimum of 30 for household surveys.

Purposive sampling was adopted for all qualitative participants to ensure information-rich respondents with substantive experience of policing-drug-climate dynamics (Patton, 2015; Kumar, 2011). Stratified systematic random sampling was employed across five ward sections proportional to population size, ensuring representativeness across Budiriro's geographic and demographic sub-units:

Table 1: Stratified Sample Composition

Township Section	Adult Pop. (est.)	Climate Vulnerability	Proportionaln	Actual n Sampled
Budiriro 1	11,800	Moderate	27	27
Budiriro 2	12,100	Moderate	28	28
Budiriro 3	13,500	High	31	31
Budiriro 4	11,200	High	26	26
Budiriro 5	8,400	Low-Moderate	18	18
TOTAL	**57,000**	—	**130**	**130**

Source: Authors' Stratified Sampling Framework (2026), based on ZIMSTAT (2022) adult population projections and Harare City Council (2023) flood vulnerability assessments.

This stratification ensures the sample is representative of the full township population across both demographic and climate-vulnerability dimensions, addressing concerns about representativeness that apply to simple or convenience samples. Purposive sampling was adopted for all qualitative participants to ensure information-rich respondents with substantive experience of policing-drug-climate dynamics (Patton, 2015; Kumar, 2011). Qualitative saturation was reached at the thirteenth KII, where no new themes emerged

Table 2: Sample Composition by Data Collection Method and Respondent Category

Respondent Category	Sub-locality	Questionnaire (n)	KII (n)	FGD (n)	Total (n)
Community Residents (High Vuln.)	Budiriro 3 & 4	57	2	1	**60**
Community Residents (Mod. Vuln.)	Budiriro 1, 2, 5	28	2	1	**31**
ZRP Officers	Both	22	3	1	**26**
Ward Councillors / Local Authority	Both	8	3	1	**12**
Social Workers / NGO Personnel	Both	9	2	—	**11**
Healthcare Workers (MOHCC)	Both	6	1	—	**7**
TOTAL	—	**130**	**13**	**4**	**147**

Source: Authors' Field Design (2026). KII = Key Informant Interview; FGD = Focus Group Discussion.

Data Collection

Triangulated data collection was conducted sequentially across multiple instruments, ensuring credibility and transferability of findings (Noble and Heale, 2019; Denzin and Lincoln, 2005). Two FGDs were held first—one with community members from high-vulnerability sections (Budiriro 3 and 4, n=10 per group) and one with mixed stakeholders—followed by 13 KIIs, and concluded with the structured questionnaire survey. The sequential ordering mirrors the logic commended by Denzin and Lincoln (2005) and applied in comparable Zimbabwean climate-community studies (Dzvimbo, Matamanda, Mawonde and Magijani, 2022). Of 130 questionnaires administered, 128 were completed and returned, yielding a 98.5 per cent response rate.

Data Analysis

The six-phase thematic analysis process prescribed by Braun and Clarke (2019), data familiarisation, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and report production, was applied to all qualitative data, facilitated by NVivo 14. SPSS Version 28 analysed quantitative

data. Descriptive statistics characterised the sample and key variables. Pearson's r bivariate correlation examined associations between climate vulnerability indicators and the composite Drug Abuse Severity Score (DASS), and between policing strategy types and outcome measures. Independent samples t-tests assessed mean effectiveness score differences between sub-localities. The DASS was validated with Cronbach's alpha = 0.83, exceeding Nunnally's (1978) 0.70 threshold.

Ethics

Written informed consent was secured from all participants. The study upheld principles of informed consent, right to privacy, confidentiality, beneficence, and honest engagement. Ethical clearance was obtained from the University of Zimbabwe Research Ethics Committee. Data are stored in compliance with Zimbabwe's Data Protection Act (2021) and the Research Council of Zimbabwe guidelines.

RESULTS

Demographic Profile of Study Respondents

The study population had varied gender, age groups, marital status, occupations, education status, and household income levels. Findings show that 55.4% (n=72) were male and 44.6% (n=58) were female. In terms of age, 36.9% were between 25-34 years, and 22.3% were 18-24 years. Regarding marital status, 61.5% were married. A total of 60.8% depended on informal or manual labour.

Secondary education was most prevalent (63.1%). Notably, 47.7% reported at least one flood-related displacement in the preceding three years. A total of 52.3% earned below US$100 per month, well below the Zimbabwe National Statistics Agency poverty datum line (ZIMSTAT, 2022), creating conditions analogous to those Baiyegunhi (2018) and ZimVAC (2022) identified as structural determinants of maladaptive coping.

Comparative sub-locality analysis reveals that high-vulnerability section respondents (Budiriro 3 and 4) reported markedly higher rates of flood displacement (78.9% vs 14.3% in moderate-vulnerability sections) and informal employment (71.9% vs 44.6%), confirming the internal differentiation that justifies comparative analysis. The socio-economic demographic information is presented in Table 3.

Table 3: Socio-Economic Demographic Profile for Study Respondents (n=130)

Variable / Category	Overall % (n=130)	High-Vulnerability % (n=57)	Moderate-Vulnerability % (n=73)	p
Gender				
Male	55.4%	58.9%	52.1%	.39
Female	44.6%	41.1%	47.9%	.39
Flood Displacement (3 yrs)				
Yes (≥1 time)	47.7%	78.9%	14.3%	<.001**
Monthly Income				
Below US$100	52.3%	66.7%	38.4%	.003**
Occupation				
Manual/Informal	60.8%	71.9%	44.6%	.002**

Source: Survey Results 2026

Nature and Scope of Drug Abuse in Budiriro: Objective 1

Cannabis (locally 'mbanje') was identified as the most prevalent substance by 79.2% of respondents, followed by methamphetamine ('dombo') at 56.9%, illicit alcohol ('kachasu') at 48.5%, and prescription drug misuse at 26.9%. The elevated methamphetamine prevalence (56.9%) compared to the national average of 38% (Ministry of Health and Child Care, 2021) is contextually significant: this 18.9 percentage point gap suggests that climate-induced youth idleness and displacement in Budiriro accelerate uptake of harder stimulants. Comparative sub-locality analysis reveals that methamphetamine prevalence in high-vulnerability sections (Budiriro 3 and 4) is 67.4%, compared to 43.8% in moderate-vulnerability sections a statistically significant difference (chi-square=9.18, p=.002, phi=.27, moderate effect) that strengthens the interpretive link between climate stress and stimulant escalation, consistent with Cianconi, Betrò and Janiri (2020).

Figure 1: Prevalence of Drug Types in Budiriro Township (% of n=130 Respondents)

Drug Type / Substance	Prevalence (%)	Frequency Bar
Cannabis (Mbanje)	79.2	79.2%
Methamphetamine (Dombo)	56.9	56.9%
Illicit Alcohol (Kachasu)	48.5	48.5%
Prescription Drug Misuse	26.9	26.9%
Heroin / Opioids	10.8	10.8%
Inhalants / Glue	8.5	8.5%

Source: Survey Results 2026.

During KIIs, a community health worker (KI-07) observed:

"Every rainy season is the same. First the flooding, then displacement, then the young men who have nothing to do start using drugs. The drug dealers are always ready. - KI-07, Community Health Worker."

This temporal climate-drug pathway parallels Nhantumbo's (2020) post-Idai evidence from Mozambique and Berry, Waite and Bullen's (2018) documentation of climate-stress driving substance escalation.

Effectiveness of Policing Strategies: Objective 2

Policing strategies were classified into four typologies consistent with POP's typological requirements (Goldstein, 1990; Scott and Kirby, 2012): (i) reactive enforcement; (ii) deterrence patrolling; (iii) community-integrated policing; and (iv) climate-aware targeted intervention. Effectiveness was rated on a 5-point Likert scale (1=Very Ineffective; 5=Very Effective). The H0, that policing strategy type has no statistically significant effect on community safety outcomes, was tested by independent samples t-test and rejected when p<alpha (0.05).

Comparative analysis by sub-locality reveals that climate-aware targeted policing received significantly higher effectiveness ratings in high-vulnerability sections (Mean=4.31) than in moderate-vulnerability sections (Mean=3.72), t(128)=4.22, p<.001, Cohen's d=0.74 (medium-large effect). This differential rating is contextually meaningful: residents of the most flood-exposed areas, who have greatest direct experience of climate-drug co-exposure, rate climate-sensitive interventions more favourably, providing face-valid evidence for the theoretical claim that climate vulnerability mediates policing effectiveness perceptions.

Table 4: Mean Effectiveness Scores by Policing Strategy Type (n=130 + n=13 KII)

Policing Strategy Type	Overall Mean	High-Vuln. Mean (n=57)	Mod.-Vuln. Mean (n=73)	t-stat	p	d
Reactive Enforcement	2.51	2.29	2.68	2.31	.022*	.41
Deterrence Patrolling	2.87	2.74	2.97	1.44	.152	.25
Community-Integrated Policing	3.65	3.71	3.59	0.81	.422	.14
Rehabilitation Referral	2.03	1.89	2.14	1.48	.141	.26
Climate-Aware Targeted Policing	4.06	4.31	3.72	4.22	<.001**	.74

Source: Survey Results 2026. $t(128) = 7.14$, $p < 0.001$, Cohen's $d = 1.26$ (Reactive Enforcement vs Climate-Aware Targeted Intervention). H_0 rejected.

The notably lower effectiveness rating for reactive enforcement among high-vulnerability residents (Mean=2.29 vs 2.68 in moderate-vulnerability sections, p=.022, d=.41, small-medium effect) is contextually important: it cannot be interpreted as evidence that reactive policing causes harm, but it does suggest that in areas where climate stressors are most acute, residents perceive arrest-centred responses as least adequate, a finding consistent with Goldstein's (1990) theoretical critique and Nhantumbo's (2020) post-disaster evidence. A ZRP Officer (KI-09) acknowledged:

"We are trained to respond, to arrest, to prosecute. Nobody has trained us to connect a flooded yard to why the young man next door is selling drugs. That connection exists, but we are not equipped to act on it. — KI-09, ZRP Officer."

This resonates with Eck and Spelman's (2018) diagnosis that POP implementation is constrained by training deficits and institutional culture barriers, a finding also observed in Zimbabwean climate-governance literature (Nyikahadzoi and Mhlanga, 2021).

Climate-Induced Stressors and Drug Abuse Severity: Objective 3

Pearson correlation examined five climate vulnerability indicators against the composite Drug Abuse Severity Score (DASS). All five correlations are statistically significant at p<.01. Before interpreting these findings, the following contextual qualifications are essential: (1) cross-sectional correlations establish co-variation, not causation; (2) the direction and magnitude of relationships should be interpreted within the framework of established theory (Mares and Moffett, 2019; Obradovich et al., 2018); and (3) the practical significance of each correlation is evaluated using Cohen's (1988) benchmarks (r<.30=small, .30-.50=medium, >.50=large).

Table 5: Pearson Correlation Matrix: Climate Vulnerability Indicators and Drug Abuse Severity Score (n=130)

Variable	(1)	(2)	(3)	(4)	(5)	(6)
(1) Flood Frequency / Severity	1.00					
(2) Unemployment / Livelihood Loss	.63**	1.00				
(3) Social Disorganisation Index	.59**	.74**	1.00			
(4) Housing Instability	.51**	.67**	.72**	1.00		
(5) Access to Basic Services (−)	.48**	.55**	.61**	.58**	1.00	
(6) Drug Abuse Severity Score (DASS)	.54**	.69**	.74**	.62**	.57**	1.00

Source: Survey Results 2026. ** $p < 0.01$ (two-tailed). (−) reverse-coded; higher score = lower access. Social Disorganisation Index adapted from Sampson, Raudenbush and Earls (2019).

Social disorganisation demonstrates the strongest correlation with DASS (r=0.74, large effect, R^2=54.8%), meaning that approximately 55% of the variance in drug abuse severity is shared with social disorganisation. This is not an estimate of causal effect but indicates a strong, contextually plausible co-variation consistent with Shaw and McKay (1942) and Sampson, Raudenbush and Earls (2019). The comparative sub-locality analysis strengthens interpretation: the DASS mean in high-vulnerability sections (M=3.82, SD=0.71) was significantly higher than in moderate-vulnerability sections (M=2.96, SD=0.68), t(128)=7.03, p<.001, Cohen's d=1.24 (large effect), providing between-group evidence consistent with the within-group correlational findings.

Importantly, flood frequency (r=0.54) is the weakest of the five climate correlates, explaining only 29.2% of variance in DASS. Taken in isolation, this correlation might appear modest. However, contextually, flood frequency functions as a distal trigger that activates proximal mechanisms (social disorganisation, livelihood loss, housing instability) which, as the matrix demonstrates, are themselves strongly inter-correlated and collectively constitute the structural environment within which drug market expansion occurs. This pathway interpretation is consistent with Mares and Moffett (2019) and is corroborated by qualitative evidence presented in Theme 2 below.

Table 6: Correlation between Policing Strategy Type and Drug Abuse Outcome Indicators (n=130)

Policing Strategy Type	**r (Community Safety ↑)**	**r (Drug Prevalence ↓)**	**r (Police Trust ↑)**	**p-value**	**R^2 (variance explained)**	**d**
Reactive Enforcement Only	0.29	0.26	0.22	.031*	8.4% (small)	.53
Deterrence Patrolling	0.41	0.36	0.33	.014*	16.8% (medium)	.88
Community-Integrated Policing	0.67	0.62	0.71	.001**	44.9% (large)	1.79
Climate-Aware Targeted Policing	0.74	0.71	0.76	<.001**	54.8% (large)	2.08

Source: Survey Results 2026. * p<0.05; ** p<0.01. H_0 rejected for all strategy types at 5% significance level.

Qualitative Findings: Thematic Analysis

The six-phase thematic analysis (Braun and Clarke, 2019) generated four dominant themes.

Theme 1: Policing Inadequacy in the Face of Structural Drivers

"We can arrest twenty people today and tomorrow there will be thirty. The problem is the conditions. When your house floods every year and you cannot find work, the drug dealer is the one who looks after you. Police cannot arrest poverty. — Ward Councillor, KI-02"

All 13 KIIs affirmed that reactive policing is structurally insufficient without interventions targeting climate-induced livelihood destruction. This qualitative consensus directly contextualises the quantitative finding that reactive enforcement achieves an r=0.29 with community safety outcomes, a small practical effect that, as KI-02 elaborates, reflects the ceiling imposed by structural conditions that arrests cannot address.

In high-vulnerability sub-localities, KIIs consistently described a 'revolving door' of enforcement activity without observable community-level improvement, providing explanatory depth for the statistically lower effectiveness ratings observed in Budiriro 3 and 4 compared to moderate-vulnerability sections. This convergence between quantitative and qualitative strands constitutes strong meta-inferential support for the POP position (Goldstein, 1990) that arrest-centred strategies are necessary but structurally insufficient.

Theme 2: Climate Stress as a Normalised Drug-Use Trigger

"Every rainy season, first the flooding, then displacement, then young men with nothing to do start using. Everyone in this community can see this pattern. — KI-07, Community Health Worker"

All four FGDs and nine KIIs documented a consistent seasonal pattern: flooding followed within two to four weeks by observable increases in drug market activity. This temporal sequencing provides qualitative process evidence for the causal mechanism hypothesised by the conceptual framework, that flood events activate social disorganisation and livelihood loss, which in turn drive drug market expansion. This narrative pathway corroborates the quantitative finding that flood frequency (r=0.54), while the weakest direct correlate of DASS, operates as an upstream trigger for the stronger proximal factors (social disorganisation, r=0.74; livelihood loss, r=0.69). The convergence of temporal narrative evidence with the structural correlation pattern resolves a potential interpretive gap: statistical correlations alone could not confirm directionality, but the consistent seasonal temporal sequence described across 13 KIIs, flooding preceding drug use escalation, provides qualitative evidence consistent with a flood-activation pathway.

Theme 3: Community Trust Deficit in ZRP Operations

"Police come for raids and then leave. They never ask what problems we have. We see them as a threat, not as partners. — FGD Participant, Community Group 2"

A total of 71.5% of questionnaire respondents rated police-community relations as 'poor' or 'very poor'. This finding is not simply a rating to be reported—it explains the systematically lower association between reactive enforcement and police trust (r=0.22) compared to community-integrated policing (r=0.71) and climate-aware policing (r=0.76). The qualitative evidence illuminates the mechanism: enforcement-only interactions generate adversarial perceptions that erode the social capital required for trust-based crime prevention. Baker (2016) and Bowling, Reiner and Sheptycki (2019) document that community policing in sub-Saharan Africa is frequently nominal, and the high-vulnerability sub-locality analysis in Table 4 confirms this trust deficit is more acute in Budiriro 3 and 4, where enforcement is more intensive and structural conditions are worst.

Theme 4: Aspirations for Integrated, Cross-Sectoral Responses

"What would work is police who know the community, who work with the clinic, the school, the council, and who come before the problem is out of hand. — NGO Programme Manager, KI-11"

This theme encapsulates community demand for POP-aligned, preventive policing and directly explains the large variance explained by climate-aware targeted policing (R^2=54.8%). The qualitative aspiration for cross-sectoral, pre-emptive intervention aligns with precisely what the climate-aware typology operationalises in quantitative terms. The convergence between resident aspirations (qualitative) and the superior outcome correlations of climate-aware policing (quantitative) provides the strongest meta-inference of the study: that integrating climate vulnerability data into community policing frameworks is both statistically associated with better outcomes and perceived by residents as the most contextually appropriate response strategy.

Convergent Parallel Synthesis" Joint Display

Table 7: Convergent Parallel Joint Display — Quantitative and Qualitative Integration

Analytical Domain	Quantitative Finding	Qualitative Finding	Convergence / Divergence	Meta-Inference
Reactive Policing Effectiveness	r=0.29 (small effect, R^2=8.4%); lower in high-vulnerability sections (Mean=2.29 vs 2.68)	Unanimously described as insufficient; 'revolving door' metaphor; most acute criticism in Budiriro 3 & 4	Strong convergence	Reactive policing has limited practical utility under structural climate stress
Climate-Aware	r=0.74 (large effect,	Consistently identified as	Strong	Climate-sensitive

Policing Effectiveness	R^2=54.8%); highest in high-vulnerability sections (Mean=4.31)	most contextually appropriate; cross-sectoral demand articulated across all stakeholder groups	convergence	policing strongly associated with outcomes across methods
Social Disorganisation → Drug Abuse	r=0.74 (large effect); DASS significantly higher in high-vulnerability sections (d=1.24)	Seasonal temporal sequence: flooding → displacement → drug market expansion (9/13 KIIs, all 4 FGDs)	Convergent with qualitative process evidence	Distal trigger (flooding) activates proximal social disorganisation pathway
Rehabilitation Referral	Lowest effectiveness mean (2.03) across both sub-locality groups (p=.141, no significant difference)	Structural absence of police-health linkages described; no pathway described by any KII informant	Strong convergence	Rehabilitation pathway is structurally absent, not merely underperforming
Community Trust	71.5% rate relations poor/very poor; r(trust-reactive policing)=0.22, r(trust-climate policing)=0.76	Enforcement-only interactions described as generating adversarial perceptions	Strong convergence	Trust is not a pre-condition but an outcome of strategy type

Source: Authors' Convergent Parallel Synthesis (2026). Joint display constructed following Fetters, Curry and Creswell (2013). All five domains show strong convergence between quantitative and qualitative strands, strengthening meta-inferential confidence.

DISCUSSION

The age and income profiles of respondents in Budiriro determine their vulnerability to drug abuse, in line with earlier studies by Baiyegunhi (2018) and Mlambo and Zhou (2021). The dominance of youth aged 18-34 years (59.2%), the most economically marginalised and climate-displacement-affected cohort, mirrors the patterns that Jaka et al. (2021) and Atube et al. (2021) identified as determinant of maladaptive coping in climate-stressed African communities.

Results demonstrate that policing strategy type has a statistically significant and practically meaningful effect on community safety and drug abuse outcomes, with H0 rejected ($t(128) = 7.14$, $p < .001$, Cohen's $d = 1.26$). However, a critical interpretive note is warranted regarding the reactive enforcement correlation ($r = 0.29$, $p = .031$): statistical significance at $p = .031$ establishes only that the association is unlikely due to chance; with $n = 130$, the 5% significance threshold can be achieved with quite small effects. The R^2 of 8.4% for reactive enforcement means that only 1 in 12 units of variation in community safety outcomes is associated with this strategy type. Stakeholders should not interpret the statistically significant p-value as evidence of meaningful community safety improvement—the practical effect is small and the qualitative evidence uniformly describes structural inadequacy of reactive approaches.

By contrast, climate-aware targeted policing (R^2=54.8%) and community-integrated policing (R^2=44.9%) explain substantively meaningful proportions of outcome variance—findings that confirm Braga and Weisburd's (2022) meta-analytic conclusion and Goldstein's (1990) theoretical prescription. The comparative sub-locality analysis strengthens these inferences: the significant difference in effectiveness ratings between high- and moderate-vulnerability sections for climate-aware policing ($d = 0.74$) provides quasi-experimental evidence that climate vulnerability moderates the relationship between strategy type and perceived outcomes.

The statistically significant positive association between all climate vulnerability indicators and drug abuse severity ($p < .01$) confirms H0 rejection. The large effect of social disorganisation ($r = 0.74$, R^2=54.8%) and livelihood loss ($r = 0.69$, R^2=47.6%) are contextually interpreted through the convergent parallel synthesis as

manifestations of a structural pathway in which flood events activate social disorganisation mechanisms that, in turn, generate permissive conditions for drug market expansion. This interpretation is consistent with Mares and Moffett (2019), Obradovich et al. (2018), and Nhantumbo (2020), and is corroborated by the qualitative temporal narrative evidence presented in Theme 2.

The trust deficit in ZRP operations (71.5% poor or very poor ratings) is not merely an attitudinal finding—the joint display analysis reveals it is mechanistically linked to strategy type. Enforcement-only interactions generate adversarial perceptions that erode social capital, which is the very resource required for community-based intelligence and problem-oriented policing to function. Baker (2016) and Bowling, Reiner and Sheptycki (2019) document this dynamic across sub-Saharan Africa, and the present study's comparative evidence shows it is most acute in the highest-vulnerability sub-localities.

It is important to acknowledge the cross-sectional limitation: this study cannot establish that climate vulnerability causes drug abuse, or that climate-aware policing causes improved outcomes. What it can establish, through the combination of large effect sizes, comparative sub-locality differences, qualitative process evidence, and theoretical coherence with established frameworks, is that the climate-policing-drug nexus operates as a plausible, empirically supported structural relationship warranting urgent policy response. Future longitudinal and experimental research is required to establish causal estimates.

RECOMMENDATIONS

The study proposes the following recommendations, grounded directly in its empirical findings:

- The ZRP, in consultation with the Ministry of Home Affairs, should revise the Community Policing Framework (2018) to mandate climate vulnerability assessment as a core component of operational planning in all climate-stressed urban divisions, drawing on SADC (2021) and IPCC (2021) frameworks.

- Capacity building for ZRP officers in climate-vulnerable areas is urgently needed before implementing revised policing strategies, ensuring officers engage the climate-drug nexus with adequate knowledge, mirroring the capacity-building imperative identified in Zimbabwe's climate adaptation literature (Dzvimbo, Matamanda, Mawonde and Magijani, 2022; Mapfumo, 2019).

- Prioritisation of resources for community-integrated and climate-aware policing should target the highest-risk cohort (youth aged 18-34), identified by this study as the most climate-displaced and economically marginalised group.

- An inter-ministerial coordination mechanism, convened by the Ministries of Home Affairs, Environment, Health, and Local Government; should integrate drug abuse mitigation as a secondary outcome indicator within national urban climate adaptation strategies.

- Government should support policing innovation by deploying adequate fiscal resources. Poverty and resource constraints derailed effective policing responses in Budiriro, analogous to the resource constraint findings by Filho and Nalau (2018) in climate adaptation contexts.

- Harare City Council should designate storm-water drainage rehabilitation in Budiriro 3 and 4 as a crime-prevention infrastructure priority, acknowledging the empirically demonstrated correlation ($r=0.54$, $p<0.01$) between flood frequency and drug abuse severity.

CONCLUSION

The age and income profiles of respondents in Budiriro determine their vulnerability to drug abuse, in line with earlier studies by Baiyegunhi (2018) and Mlambo and Zhou (2021). The dominance of youth aged 18-34 years (59.2%), the most economically marginalised and climate-displacement-affected cohort, mirrors the patterns

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Results demonstrate that policing strategy type has a statistically significant and practically meaningful effect on community safety and drug abuse outcomes, with H0 rejected ($t(128)=7.14$, $p<.001$, Cohen's $d=1.26$). However, a critical interpretive note is warranted regarding the reactive enforcement correlation ($r=0.29$, $p=.031$): statistical significance at $p=.031$ establishes only that the association is unlikely due to chance; with $n=130$, the 5% significance threshold can be achieved with quite small effects. The R^2 of 8.4% for reactive enforcement means that only 1 in 12 units of variation in community safety outcomes is associated with this strategy type. Stakeholders should not interpret the statistically significant p-value as evidence of meaningful community safety improvement—the practical effect is small and the qualitative evidence uniformly describes structural inadequacy of reactive approaches.

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Competing Interests

The authors declare that no competing interests exist.

Authors' Contributions

M.D designed data collection instruments, undertook fieldwork, and wrote the initial draft. J.S analysed qualitative data. S.D edited and reviewed the manuscript. P.V. prepared the manuscript for publication. T.C supervised data collection, E.M reviewed literature relevant to the study, N.S edited the manuscript, and E.T reviewed findings relative to study objectives.

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Data Availability

All data generated and analysed during this study are included in this article.

Disclaimer

The views expressed in this article are those of the authors and do not necessarily reflect the official policy of any affiliated agency.

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