

Research Article

Environmental Protection and Economic Development in Zimbabwe

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The main objective of the paper is to assess the implications of the business expansion approach to economic development in Zimbabwe on the quality of the environment. In terms of the research methodology, the research adopted a mixed methodology and utilized a parallel semantic convergent research design. The study gathered data using questionnaires, interviews, and observations from the 600 randomly selected businesses from the agriculture, entrepreneurship, and small-scale mining sectors. Data were analyzed using STATA. The paper hypothesized that there is no significant relationship between entrepreneurship, mining, and agricultural activities under Zimbabwe's expansion business approach and environmental protection. The findings have highlighted that Zimbabwe is dominated by illegal entrepreneurship, peri-urban agriculture, and artisanal mining activities. Such illegal activities negatively affect the quality of the environment in Zimbabwe. There is a lot of environmental degradation and land pollution associated with the expansion of nonformal and illegal business activities in Zimbabwe. However, the paper concluded that illegal agricultural, mining, and entrepreneurial activities which have been expanding since 2008 in Zimbabwe are affecting the quality of the environment. In terms of policy implications, it is necessary to put in place institutional instruments and enforcement mechanisms to protect the environment under the Zimbabwe expansion business approach.

1. Introduction

Following an economic recession period in the 2000s, Zimbabweans embarked on an economic recovery program in 2017 under the leadership of the new administration. The main objective was to open Zimbabwe for new business and opportunities as an economic recovery strategy. Due to the higher unemployment rate and desire to exploit the new business opportunities created by the new government administration, the informal sector and illegal unregistered businesses grew faster than the registered companies in all sectors of Zimbabwe posing environmental risks to Zimbabwe. Landrigan [1] has shown that illegal mining activities degrade the quality of the environment. In a study previously conducted by Mkodzongi [2] on the effects of business expansion on environmental protection, he focused on the mining sector since it was the only expanding sector in the Zimbabwean context. This however is now a different situation as all sectors are now promoted to grow and expand

under the economic recovery strategy implemented in 2017. From an economic and political perspective, the business strategy in Zimbabwe aimed at creating good relations with mining, agriculture, industry, and entrepreneurial international and domestic players which can revive the economy through the expansion of business. The new government is operating under the theme “Zimbabwe is open for business,” and a report from the Ministry of Finance [3] presented below reveals that business expansion has been on the rise since then.

Figure 1 highlights the variation in the expansion of the business between 2008 and 2022, suggesting that there was no significant increase in the economic activities which might have an impact on the environment. However, this might differ in Zimbabwe as a new strategy was introduced by the new government to recover the economy from recession. The expansion might trigger environmental effects and impacts; thus, since little is known about the effects of the “Zimbabwe expansion business” theme, it is against the

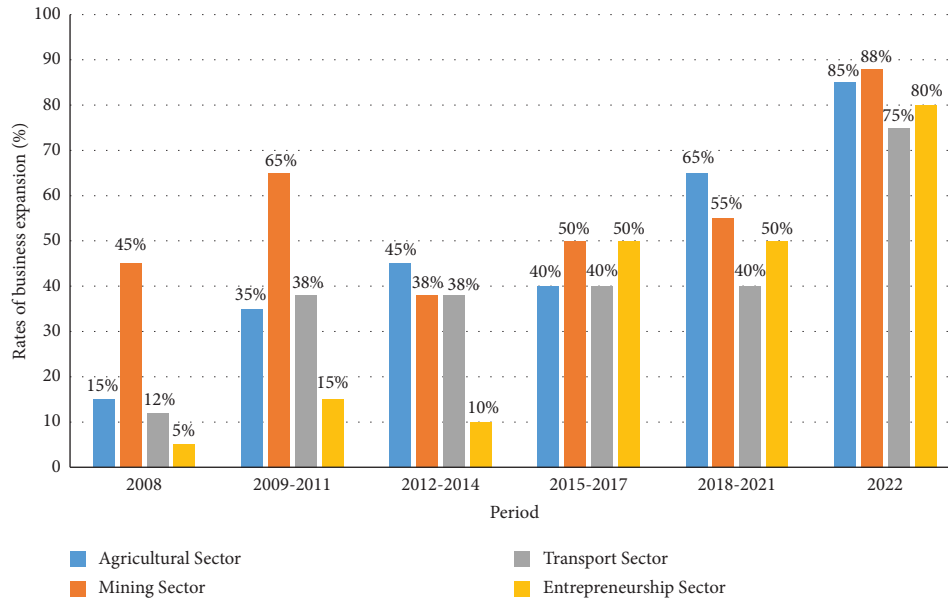


FIGURE 1: Level of business expansion in Zimbabwe, 2008–2022.

background of the study that the researcher sought to assess the implications of Zimbabwe open for the business approach on environmental protection. Therefore, this paper seeks to look into the effects of such illegal agricultural activities and entrepreneurial combined with small-scale mining activities on the quality of the environment.

Lyster [4] suggests that business expansion recovery themes are prime movers to economic development through the engagement of local and international investors from around the world, but little has been done to assess the impact of such business expansion strategies on the quality of the environment, and this study contributes to the knowledge gap by assessing the effects of business expansions on environmental protection. Although the Government of Zimbabwe is focusing on a business expansion strategy to support economic development in the country, it is silent on how these business expansion developments will address the issues of environmental degradation that have already started since 2008 in the country.

Since there are no specific policy strategies that are developed to successfully address all the environmental implications associated with illegal business expansion from the literature and empirical point of view in Zimbabwe, this study contributes by highlighting the effects of such business expansion and at the same time recommending the policy strategies that can be used by the Zimbabwean environmentalists and policymakers in protecting the Zimbabwean business environment, allowing the economy to grow and develop.

2. Materials and Methods

2.1. Methodology. The study adopted a mixed methodology since it was rooted in the pragmatic philosophical assumptions. The study utilized a parallel semantic convergent research design and gathered data using questionnaires,

interviews, and observations from 600 randomly selected businesses in Zimbabwe regardless of registration status. However, as a sampling strategy, a stratified method was adopted where 3 strata were developed: agriculture, business entrepreneurship, and mining. To avoid biases, 200 participants were selected to equally represent each stratum.

2.2. Statistical Modeling. Panel regression was adopted, and a Hausman test was further conducted to check the presence of random effects or fixed effects in the regression model:

$$Y_{ni} = B_0 + B_1 X_{1ij} + B_2 X_{2ij} + B_3 X_{3ij} + e, \quad (1)$$

where Y = Annual Environmental Protection Index, X_1 = number of illegal miners, X_2 = number of informal entrepreneurs, X_3 = number of peri-urban illegal farmers, B_0 = constant in the regression model, B_1 = beta coefficient to estimate the extent of the effect of number of illegal miners on environmental protection, B_2 = beta coefficient to estimate the extent of the effect of the number of informal traders on environmental protection, B_3 = beta coefficient to estimate the extent of the effect of the number of peri-urban illegal farmers on environmental protection, and e = residual error term.

2.3. Variable Meaning and Expectations

2.3.1. Dependent Variable: Environment Protection Index. The dependent variable is composed of assessing the beauty of the environment, the overcrowdedness and environmental competition, the existing environmental law enforcement, and the level of degradation of the environment. The panel regression for the period 2008–2022 was run based on the secondary data on the environmental protection index gathered from the Environmental Management Agency (EMA) in Zimbabwe.

TABLE 1: Random-effects regression for the Zimbabwe expansion business economic activities on environmental protection.

Random-effects GLS regression Group variable: business group			Number of obs = 600 Number of groups = 3			
R-sq:						Min = 6
Within	=0.611		Obs per group:			Ave = 5
Between	=0.992					Max = 6
Overall	=0.882					
Corr (u_i, X) = 0 (assumed)			Wald (χ^2) =		362.14	
			Prob > χ^2 =		0.000	
EnvironProt_Index	Coef	Std. err	Z	$P > z $	95% conf. interval	
Legal entrepreneurship	15.221	0.251	15.24	0.000	12.1125	16.5662
Number of informal entrepreneurs	-48.552	0.112	-44.22	0.000	-50.22451	-43.22145
Legal mining	8.421	0.997	7.442	0.003	6.77696	9.77654
Number of illegal miners	-17.884	0.031	-16.89	0.000	-18.9877	-16.8876
Agricultural expansion in rural areas	22.147	0.037	19.77	0.002	12.22152	23.25546
Number of peri-urban illegal farmers	-6.891	0.743	-6.14	0.001	-8.78419	-5.98331
_cons	-0.224	0.151	-7.14	0.000	-1.225749	0.114522

Source: STATA.

2.3.2. *Independent Variables.* The dependent variable is influenced by the number of illegal miners, the number of informal entrepreneurial actors, and the number of peri-urban illegal farmers. The hypotheses were as follows:

H₁: There is a significant relationship between the number of informal entrepreneurs and the Annual Environmental Protection Index

H₂: There is a significant relationship between the number of peri-urban illegal farmers and the Annual Environmental Protection Index

H₃: There is a significant relationship between the number of illegal miners and the Annual Environmental Protection Index

2.4. *Data Type and Sources.* Surveys, observations, and interviews were adopted to gather data from the local community members. To aid data collection, secondary data were also utilized to gather data on the environmental protection indices on a yearly basis from EMA and local governance authorities. Data were analyzed using statistical packages, such as STATA, and qualitative NVivo was adopted to develop themes.

3. Results and Discussion

The study presents the following findings.

3.1. *Increase in the Number of Peri-Urban Informal Entrepreneurs and Environmental Protection.* First, the study hypothesized that there is no significant relationship between the number of informal entrepreneurs and the Annual Environmental Protection Index. Table 1 shows that an increasing number of formal entrepreneurs have a positive effect on environmental protection with a factor 15.221. On the other hand, an increasing number of informal

entrepreneurs are negatively influencing environmental protection with a factor 48.552. A low environmental protection index has been associated with an increasing number of informal and unregistered actors who are selling clothes in places where there are no sanitary systems and buildings [5–7].

Figure 2 shows that an increasing number of informal entrepreneurs have degraded the quality of the environment. As highlighted in Figure 2, vendors and community members selling second-hand clothes are dumping trash in public places although the council is not consistently collecting refuse. On the other hand, results have shown that the majority of residents expanding are causing air pollution with unregistered public transport and residents with small unregistered restaurants in Zimbabwe. Based on the interviews conducted, participant F from the EMA posits as follows:

Vending has created land pollution in Zimbabwe and the degradation of the environment. Expansion in informal trading is compromising the resources available thereby causing land degradation

However, the researcher asked the residents in terms of the availability of sanitary toilet systems in the business operation and community site. Respondent C confirmed as follows:

We do not have a built sanitary public toilet within our business operation site. The majority of us make use of bushes close to the community or closed corners of the city roads.

The researcher posed a question to a participant from the local authority of Zimbabwe whether they have plans to build public toilets within business operations in which residents are operating, and he responded as follows:



FIGURE 2: Illegal/informal entrepreneurs under the Zimbabwe expansion business approach. Sources: participant observations, Zimbabwe.

As a local authority, we cannot build a public toilet for unregistered residents who are operating from an illegal site and also the rate at which urban sprawling is increasing is higher although as council we have run short of funds to perform such a duty.

Based on the arguments from residents and council, the results of the study suggest that if the rate of urban sprawling increases marginally, there is potential to cause diseases such as typhoid, cholera, and malaria. The council also confirmed that they are not consistently collecting refuse as participant K highlighted the following:

Frequent collection of refuse from the council perspective is now a challenge due to shortage of fuel and poor functional vehicles under the Zimbabwe Local authority.

The results of the study confirmed that, since 2008, the majority of the businesses have been operating unlicensed as one respondent highlighted as follows:

I am a vendor selling tomatoes and agricultural produce close to the main road in city center and I cannot register my business since there is no security or infrastructure to protect my inventory.

The researcher consulted the Council of Harare during the data collection phase to confirm whether companies under Zimbabwe open for the business approach were registered. From the responses offered by participant G from the council, he highlighted as follows:

Since the announcement of Zimbabwe's expansion business approach the registration of the business has been undergoing process but a very slow rate of 2% which is a critical issue under the council. Majority of the businesses are operating on illegal basis and as council we are always running around evicting such offenders.

3.2. Increased Number of Peri-Urban Illegal Farmers and Environmental Protection. Second, the study hypothesized that there is no significant relationship between the number of peri-urban illegal farmers and the Annual Environmental Protection Index. Table 1 shows that legal agricultural expansion in rural areas has a positive effect on environmental protection in terms of the development of economy with a factor 22.147. On the other hand, illegal peri-urban agricultural activities negatively influence environmental protection with a factor 6.891. The findings gathered through EMA have shown that illegal peri-urban farmers are using herbicides and fertilizers with residual effects that affect natural tree and plant growth, and chemicals are also causing eutrophication which has interfered with natural ecosystems in streams and rivers close to towns.

3.3. Increased Number of Illegal Miners and Environmental Protection. Furthermore, the study hypothesized that there is no significant relationship between the number of illegal miners and the Annual Environmental Protection Index. Table 1 shows that legal mining has a positive effect on environmental protection in terms of the development of economy with a factor 8.421. On the other hand, artisanal illegal mining negatively influences environmental



FIGURE 3: Effects of illegal mining expansion on environmental degradation. Sources: participant observations, Zimbabwe.

protection with a factor 17.884. The findings gathered through observations and interviews support the statistics. Figure 3 shows a picture drawn during data collection as evidence to the findings:

In addition, Figure 3 also shows the other observed activities which are degrading the quality of the environment in Zimbabwe. Relating to the effects of illegal mining activities, Figure 3 shows that unfenced cyanide tanks have the potential to harm local and domesticated animals from a safety and health perspective. During an interview with participant F from EMA, he postulated as follows:

We have received cases of local domesticated animals such as cattle here in mining areas drinking water with cyanide. In some cases, we fear that one of these days people might end up drinking water mixed with cyanide due to exposure of such chemicals in the community.

However, the results of the study imply that SMEs under small-scale mining are not exercising safety and health practices, and unprotected cyanide tanks and chemical exposure are hazards with the potential to harm people. In addition, the results of the study also highlighted that the small-scale mining SMEs are leaving open pits unprotected and without signage which is a hazard to both animals and human beings. Based on the interviews conducted, participant F again from the EMA posited as follows:

Small-scale mining (artisanal miners) which started under new dispensation period do not have adequate safety equipment and signage. They leave open pits within their mining sites. There are so many cases where farmers in Zimbabwe are reporting deaths of livestock associated with falling in mining pits. In some cases though not reported through us as EMA, we have had a case where other people were injured due to falling in those pits without signage.

However, open pits are some of the hazards with high likelihood to harm people and livestock within the Zimbabwe district community. Based on the arguments from SMEs and the council, the results of the study suggest that the business operating environment of SMEs in Zimbabwe is a hazard since there is potential to cause diseases such as typhoid, cholera, and malaria. Findings confirmed that businesses expanding in Zimbabwe are causing land, air, and

water pollution. Pollutants are often dispersed across cities or concentrated in industrial areas or waste sites since people sometimes bury tremendous amounts of waste in the ground at municipal and industrial dumps [8]. According to Macheka [9], the existing pressures of the informal workforce associated with economic recovery themes are partly the result of overcrowding and environmental competition within the informal sector, which degrade environmental quality and threaten sustainability. Hove [10] asserted that enterprises are small and that they require little or no capital investment, which leads to overcrowding in informal enterprises and land and water pollution as few resources will be shared per unit. The literature points out that rapid business expansion results in very high levels of erosion and sedimentation in river channels as shown in most rivers, especially in urbanized areas. The adverse effects of that business expansion are not only erosion and other changes in land quality but also pollution [11]. Water quality has also degraded with time due to urban sprawling which ultimately leads to increased sedimentation, thereby also increasing the pollutant in run-off.

3.4. Combined Effect of the Informal Business Expansion on Environment Protection. Figure 4 shows that the increase in the number of illegal miners, illegal farmers, and illegal entrepreneurs in Zimbabwe has caused more water pollution and land pollution.

The findings have also shown that 80% of water pollution in Zimbabwe can be attributed to illegal businesses. Drawing from research by Dannenberg et al. [13], Neumann et al. [14], Bidwell et al. [15], Cooke et al. [16], and Clark et al. [17], illegal commodity sellers litter everywhere and do not have access to proper refuse bins and structures, which end up polluting water and land in most economies. On the other hand, 90% of land pollution is associated with illegal unregistered business activities under the Zimbabwe expansion business. However, it was noted that 75% of air pollution is attributed to big industrial and mining activities in registered businesses. Illegal businesses pollute the air as many of the activities are not adhering to safety and health procedures [18–20]. In terms of statistical inference, the findings showed that the coefficient of determination (R^2) coefficient value of 0.882 suggested that 88.2% of the variance in the environmental protection index is explained by the increase in the number of illegal miners, illegal farmers, and illegal

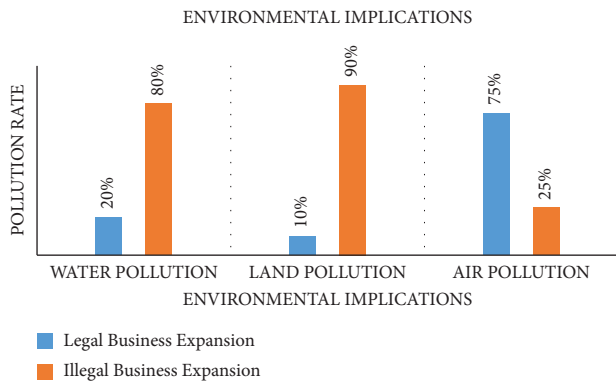


FIGURE 4: Environmental pollution rates as a result of economic recovery themes. Source: EMA [12].

entrepreneurs. Since all factors are statistically significant, all the stated hypotheses were rejected, and it was concluded that the increase in the number of illegal miners, illegal farmers, and illegal entrepreneurs since 2008 in Zimbabwe has an effect on environmental protection. Wald (χ^2) is 362.14 and $\text{Prob} > \chi^2 = 0.000$ suggesting goodness of fit of the overall model in predicting environmental protection as the development indicator in Zimbabwe.

4. Conclusions and Policy Implications

The study concludes that, although Zimbabwean government has embarked on a journey to recover the economy through business expansion, an increase in the number of illegal miners, illegal farmers, and illegal entrepreneurs which has occurred since 2008 has a negative effect towards environmental protection. From the findings, it has been noted that entrepreneurs are illegally engaged in trading of second-hand clothes, unregistered public transportation people, and goods as well as unregistered money exchanging activities in areas without sanitary systems. This has affected the environmental quality of such so-called market places. Due to the unavailability of public toilets and inconsistency in refusal collections in areas where informal and illegal entrepreneurship is happening, there is high potential to cause diseases such as typhoid, cholera, and malaria. On a second note, an increase in the number of illegal miners who do not compensate for the degraded land has been noted to have a negative effect towards environmental degradation. Illegal small-scale miners are leaving unfenced cyanide tanks which have potential to harm local and domesticated animals from a safety and health perspective. In addition, small-scale mining SMEs are leaving open pits unprotected and without signage which is a hazard to both animals and human beings. As a result, there is now a lot of water, air, and land pollution associated with illegal expansion in small-scale mining activities. On a third note, peri-urban farming activities through the use of chemical herbicides and fertilizers have destroyed the environment meant for natural tree species and other ecosystems.

Although the study was conducted in Zimbabwe, the study was mainly delimited to Chegutu, Harare, and Kadoma areas to represent whole Zimbabwe. There is

a chance that, given findings, there is a need to look at the same theme from other areas like Bulawayo, Masvingo, and Gweru which are also cities in Zimbabwe. Cost and time were major limitations to expanding geographical delimitations. However, through policy lobbying and advocacy on environmental issues, the researcher intends to engage the government of Zimbabwe and other development agents to fund the full research to cover whole Zimbabwe and if possible the SADC region for comparison purposes.

Using the current findings, it is necessary to put in place institutional instruments to enforce legal instruments to protect the environment under Zimbabwe's expansion business approach. Local authorities must ensure that all businesses expanding under Zimbabwe expansion business are registered and allocated space within designated areas which can ensure control of environmental pollution and clear criteria for approving business. EMA must ensure that all SMEs are educated in terms of all environmental laws and standards to ensure that they develop a culture of protecting the environment and to make sure that all established businesses are monitored. The Ministry of Mines together with EMA must enforce laws regarding open pits and unprotected chemical exposure to protect both the environment and people within mining communities.

The vetting for SMEs who are applying to operate must be properly performed with environmental aspects in mind to ensure that all businesses with a higher risk of harming the environment and people are located far from people or minimized. Local authorities must consistently collect refusal from towns and communities as a way of reducing proneness and the likelihood of disease spread.

Data Availability

The research data used to support the findings of this study may be obtained from the author upon request.

Conflicts of Interest

The author declares that there are no conflicts of interest regarding the publication of this paper.

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