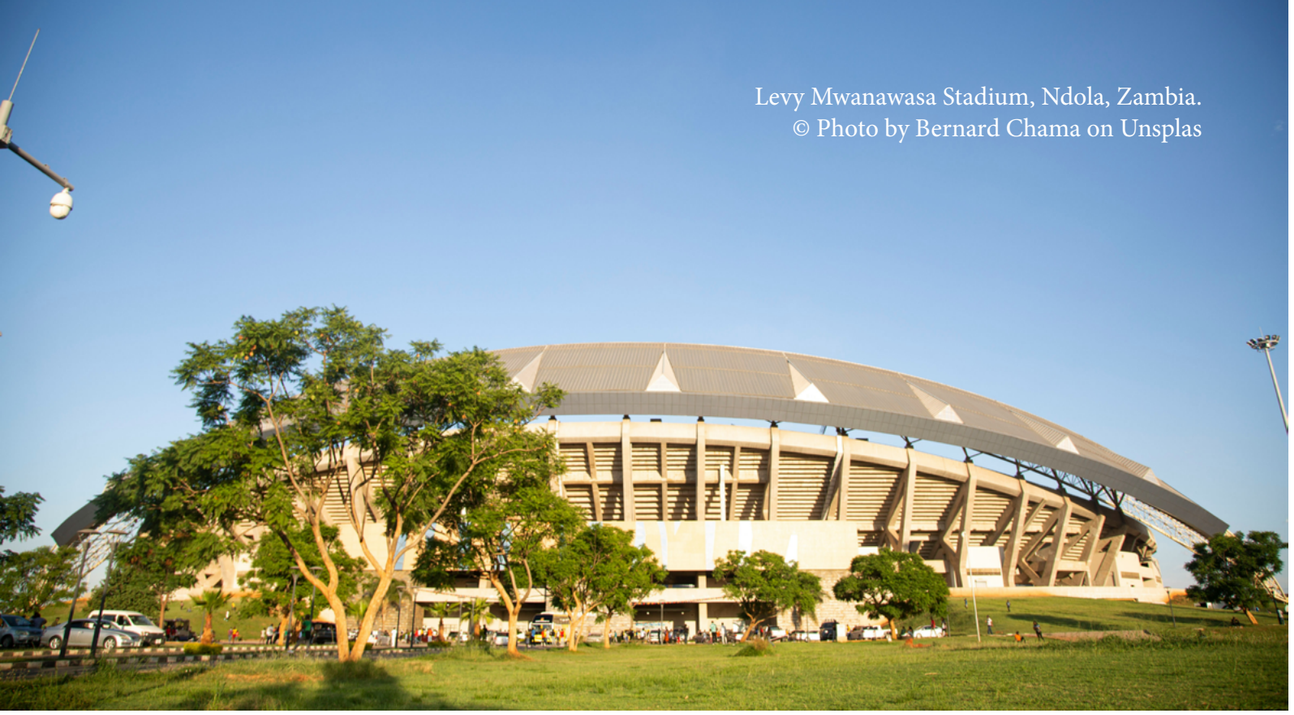

Levy Mwanawasa Stadium, Ndola, Zambia.
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An Examination of the Environmental Impact of Illegal Mining Activities on Land in the Copperbelt Province of Zambia

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Abstract

In the contemporary world, mining operations often contribute to water, land and air pollution. In the Copperbelt Province of Zambia, illegal mining practices have often led to deforestation, soil degradation and vast land damage or ruin due to the digging of huge pits, trenches, tunnels and ditches by illegal miners. Such practices continue to have a huge negative impact on the environment and the lives of the local people, most of whom depend on land for farming. Illegal mining remains a threat to the environment, biodiversity and the wellbeing of the people. The centrality of this theme can be attributed to the various environmental problems that continue to occur due to illegal mining practices, to the extent of affecting not only the environment but also biodiversity and the wellbeing of the people. This paper examines the environmental impacts of illegal mining activities on land in the Copperbelt Province of Zambia based on three key questions: what are the impacts of illegal mining practices on land in the Copperbelt province? How has the Zambian government been responding to the situation? How can the notion of environmental justice and Christian ecotheology be used to respond to the crisis? Based on such key questions, this study seeks to assess the impact of illegal mining practices on land, discuss the response of the government and the society to the issue and propose a possible way forward.

Keywords: environmental, justice, unlicensed, illegal, Copperbelt, ecotheology, mining, land

Introduction

We live in an era of ecological crisis, where human actions continue to harm the environment, pollute the atmosphere and destabilise nonhuman species. Such human disturbances do not only degrade and cause the environment to deteriorate, but they also cause the extinction and annihilation of vast numbers of species. In 2004, the United Nations' High-level Panel on Threats, Challenges and Change identified environmental degradation as one of the major threats to world peace and security. Similarly, the Paris Agreement adopted in 2015 at the Paris Climate Conference is an attempt by most countries in the world to respond to the threat of global warming with the aim of limiting or mitigating the increasing temperatures to below 2 degrees Celsius. This was the first globally and legally binding deal on climate change to be adopted by 195 countries. Such global efforts show that environmental and atmospheric pollution continue to threaten the natural environment and atmosphere, leading to threats such as global warming. Seriously polluted and degraded environments have become unfavourable to all forms of life and have contributed to the degeneration of the quality of the natural environment and volatility in ecosystems.

Academic, scientific and media literature and reports expose several issues relating to environmental degradation and pollution which reaffirms the worsening ecological crisis the earth is undergoing. Nature continues to suffer exploitation and degradation through human activity. One wonders why all the voices stressing the need to care for the environment, atmosphere and biodiversity continue to fall on deaf ears. What are we doing wrong? Why are people not heeding the calls being made by governments, religious organisations, environmental activists and movements and various groups on the need to care and nurture the earth? Is there still hope of saving and liberating the earth from human domination and oppression? Such questions ought to be pondered by everyone because they concern the real and daunting problem confronting humanity as a whole today.

There is a need for more effort to protect and safeguard the environment well. Environmental degradation through land, air and water pollution, the destruction of ecosystems, and the extinction of wildlife continue to be a core problem today. The mining sector is one of the major causes of environmental degradation and pollution globally. Under the mining sector, the pervasive problem of environmental degradation caused by illegal mining operations is one of the main issues facing many African countries. Zambia is one of the major producers of copper, cobalt and gemstones, including precious metals such as silver and gold. The mining sector makes a substantial contribution to the country's economy. The mining sector in Zambia is governed primarily by the Mines and Minerals Development Act of 2015 (amended in 2016) promulgated through the Ministry of Mines and Minerals Development. Although most mining companies follow the Act and other related mining and environmental regulations, there have been illegal and unregulated mining operations in the Copperbelt province.

Illegal Mining Operations in the Copperbelt Province

Illegal mining activities are contrary to the laws of Zambia regulating the mining industry since they involve the unlawful mining of mineral deposits, precious stones and quarrying of stones in prohibited areas. The history of illegal mining in the Copperbelt province of Zambia is closely linked to the historical development of the mining industry itself and some of the mining regulations concerning mineral and land rights. Although the issue of illegal mining had been to a greater extent unknown to the public until 2000, it has become a daunting subject in recent years due to the escalation of cases and incidents related to it.

What is Illegal Mining?

Illegal mining activities have become a major issue in Zambia given the problems that arise from such unlawful operations. Illegal mining can be defined as the unregulated, unlicensed and informal ways of mining on unofficially explored areas and prohibited sites such as old mine dumps and pits. For Kambani [2003:143], illegal mining involves the unauthorised mining of mineral deposits, precious stones and the now escalating 'illegal quarrying of stone aggregates, flat stones, gravel and building sand used in home construction.' Although in recent years larger companies have been implicated in the illegal mining scheme, most illegal miners are small-scale. Illegal miners in the Copperbelt engage in the mining of minerals such as copper, gold and gemstones and often rely almost entirely on human labour using rudimentary technology and tools such as shovels, picks, trowels, hoes, spades, flat big stones and wheelbarrows.

In the Copperbelt province, illegal miners are commonly referred to as "Jerabos" (jail boys). However, the term "Jerabo" is sometimes used by locals to refer to both unlicensed small-scale miners and copper thieves and gangs or notorious illegal copper dealers on established mines such as Konkola Copper Mines' (KCM) Nchanga Mine on the Copperbelt, a practice which is different from unlicensed mining operations. According to Kabanda [2012], in June 2017 Max Maona, Head of Security at Konkola Copper Mines (KCM) in Chingola affirmed that "Illegal mining is pure theft of copper" and that "the illegal miners have increased in numbers and have become violent and are using weapons". The Zambian law requires that all miners, whether foreign investors or Zambian citizens, obtain mining licences from the government. Regarding legality in mining, the Mine and Minerals Development Act of 2015 prohibits individuals and companies from engaging in mining, mining exploration and mineral processing without a proper licence. The affirmed is stated in Section 12(1) of the Mines and Minerals Development Act of 2015 which strictly forbids anyone from carrying "on mining operations, mineral processing operations or gold panning except under the authority of a mining right, mineral processing licence or gold panning certificate granted under this Act" [Parliament of Zambia 2015]. Illegal miners do not only divert from the legal framework in their mining operations, but they also ignore the environmental impacts of their mining activities.

Historical Overview of Illegal Mining in the Copperbelt Pre-2000

In the Zambian territory, mining activities can be traced from the Iron Age period when iron smelting was practiced. By 1700, traditional small-scale mining activities focused on surface outcrop mineral deposits which the indigenous people "would melt and mould the copper into ingots used as a medium of exchange and other metal products" such as ornaments, tools and weapons [Sikamo 2016:491]. The mining and land rights belonged to local traditional rulers who, through village Indunas, regulated the mining processes and mineral trade with outsiders. Although local rulers were custodians of mining operations in the villages and regulated mineral rights, the indigenous people had access to minerals.

From 1889 onwards, there was extensive mineral exploration of the region by Western companies and professional individuals. For example, increased exploration activities by foreigners led to the founding of more mining sites such as Hippo mine (discovered by Jacob Elliott) in 1903 in Kafue, whose large-scale mining operations were opened in 1911 [McIntyre 2016:431]. By this time, although local chiefs still controlled land rights which included mining, the British South African Company (BSAC) had obtained some mining rights by signing treaties which gave the company exclusive mineral rights over most of the Zambian region. The actual development of mining legislation and the issue of illegal mining came with the enactment of the 1912 Mining Ordinance under Mining Proclamation, No. 1 which was to regulate the mining industry in the Zambian region. According to Ndulo [1986:8], the 1912 Mining Ordinance granted "the BSAC with a mechanism for regulating the mining rights granted by the company". The statute also granted that anyone who acquired a mining license at a minimal fee was free to mine in any area of the region except in specific areas designated to the BSAC's mines. For the first time, this meant that individuals and companies who engaged in mining activities in the region without obtaining a legal licence would be considered illegal miners, although such activities were not strictly monitored. Thus, by 1923 there were already a number of informal mining operations without licences regardless of the need to acquire mining licenses.

From 1924 onwards, there was a massive boom in the mining industry which was mainly controlled by South African and American companies. The use of advanced machinery in smelting and metal extraction facilities in commercialised mines which was inspired by the need to maximise profits led to the production of large quantities of copper and other minerals. Thus, "by 1964, Zambia was a major player in the world copper industry, contributing over 12% of global output" [Sikamo 2016:492]. Despite the increased production of copper in pre-1964, much of the revenue and royalties were diverted to the BSAC as the owner and custodian of the mineral rights. After Zambian independence in 1964, the question of mineral rights between mine owners and the government was explored and led to the promulgation of the Mines and Minerals Act of 1969. Based on the Act, the government was granted control over the mining industry by acquiring the mineral rights, the right to control the issuing of mining licences and opening of new mining operations [Hast 1990:737].

By 1970, there was an emphasis on the 'accession system' which demanded that ownership of minerals in a specific area correspond to ownership of the surface land. Although there is no evidence of the presence of commercial illegal mining operations in the 1960s and 1970s, the informal small-scale mining operations continued both in the old mining sites and other unexplored areas. Most of them worked in groups and relied on their own resources such as hand tools and other equipment in their illegal mining operations. The period after 1970 saw the government's attempts to nationalise the mining industry which escalated illegal mining operations when the mining industry began dwindling under the nationalisation scheme. Due to the heavy reliance of the country's economy on the mining industry especially after the nationalisation of mines between 1969 and 1996, the mining industry suffered undercapitalisation with obsolete machinery and without much investment in upgrade, among other challenges. Thus, while the mining sector under the nationalisation scheme was struggling, "employment was falling, imports were declining, and foreign debt was on the increase" [Limpitlaw 2011:737]. The affirmed factors led to an increase in illegal mining activities on the Copperbelt province, especially because most of the former ZCCM workers who had been retrenched had to find alternative means for survival. In Zambia post-1996, the re-privatisation of mines became a goal, though illegal mining continued to escalate.

Illegal Mining in Copperbelt Post-2000

Although I have demonstrated the presence of illegal mining activities in Zambia before 2000, these activities were by and large unreported due to the lack of strict monitoring of such cases by the authorities. Further, the public lacked awareness of the issue since most illegal mining cases were ignored and not publicly reported. Thus by 2000, there were already several flourishing informal mining activities on the Copperbelt. From 1997 onwards, several changes in the mining sector were followed by a severe reduction in permanent jobs on the mines. According to Mususa [2010:202], it was a response to this "severe contraction of the permanent labour force on the Copperbelt' that 'women and children entered the informal sector in large numbers, seeking to subsidize men's declining involvement in the formal sector".

The initiative of the government to privatise the mining sector did not help curb the decrease in employment in the formal mining sector; consequently, informal mining activities remained prominent. Most people began to engage in unlicensed mining operations in groups. According to Mususa [2010:202], on 28th July 2000, Saluseki, in an article of the Post Newspaper, reported that 12 people had been arrested over illegal mining on the Copperbelt. The same article reported that Patrick Bowa, Director of the Inter-trade Institute, had written a letter of complaint to Silas Ngangula the then Inspector General of Po-

lice indicating that the arrest was unfair since illegal mining activities were the only alternative for making a livelihood. In his letter, Patrick Chilufya Bowa stressed the need to bring "bonafide small scale miners, illegal miners and retrenched miners into the main stream small scale mining commercial activity in line with Zambia's status as a mining nation" [Mususa 2010:202].

Bowa's plea underlies the idea that small scale miners be granted artisanal mining licenses to recognise their mining operations which was expressed by various individuals after the retrenchment of many ZCCM mine workers. Since 2000, there have been many cases of illegal mining activities that have been reported on the unregulated mining of mineral, precious stones and stone quarrying on unused mine pits, mine dump sites and other related places. In a research concluded in 2003, Kambani [2003:143] found that "the majority of illegal miners are involved in gemstone mining and is very mobile and will migrate quickly to a reported new find". In March 2009, another case of illegal mining was reported in the Times of Zambia Newspaper where an illegal miner was shot dead and twelve others were wounded [Times of Zambia, 2009]. Similarly, in June 2009 the Mining Review Africa [2009] also reported that "at least eight Zambian illegal miners have been killed in the collapse of the disused Nkana West mine dump in the northern Copperbelt province". Such cases reaffirm the fact that unlicensed mining operations by small-scale miners on the Copperbelt have become a daunting issue.

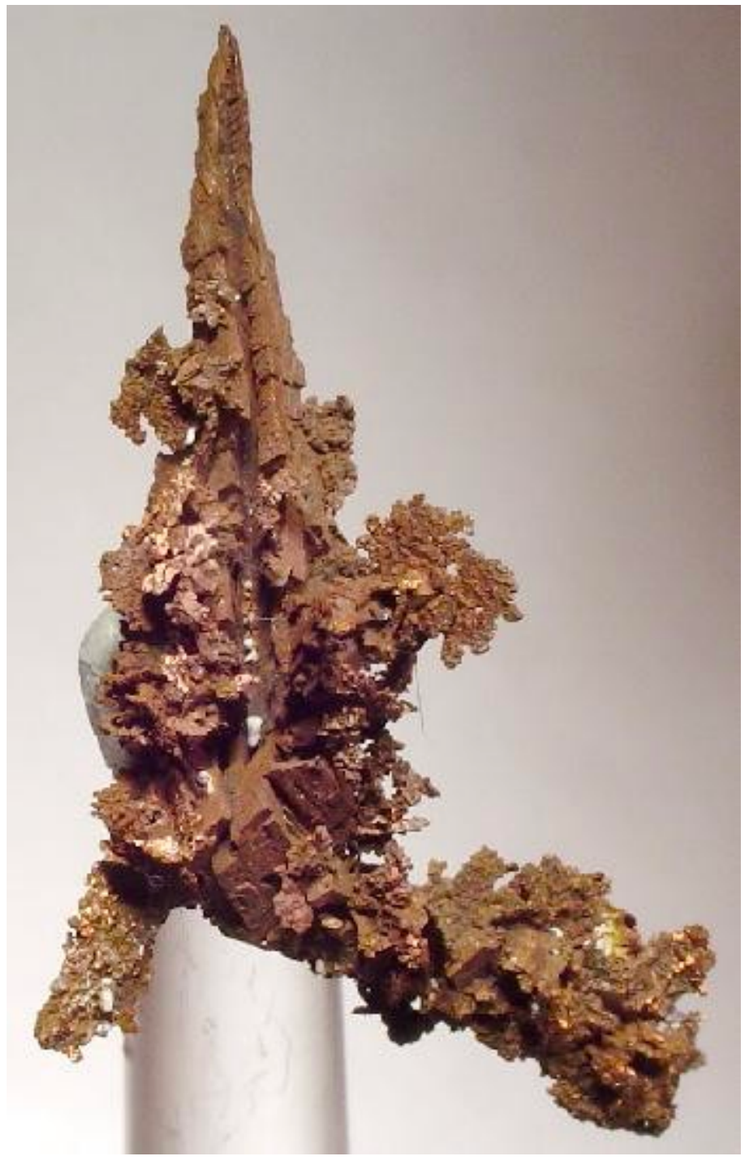
Illegal mining operations continue to be carried out within the established mining premises, on mine dumps such as the 'Black Mountain' in Kitwe, deserted mine sites left behind by closed formal mining operations, and other unauthorised places where the mining of minerals and stone quarrying is done. The issue of illegal mining has continued to be embedded in the economic system based on the struggle for livelihood and the lack of alternative means to raise income. According to Mikula [2013:12], when Mr Dickson Nkonde, an illegal miner in Chingola, Copperbelt, was found on an illegal mining site, he expressed the seriousness of the issue: "this is nothing; we dig longer tunnels than this. We dig even one-kilometre tunnels and many others branching out…sometimes we can be 1500 or 2000. We are many, but others are hiding". Regarding the reasons behind his illegal mining activities, Mr Nkonde explained: "We are unemployed, and we are suffering, that's why we engage in illegal mining. Even if I fear for my life, I have no choice because my family will starve, and the landlord will evict me" [Mikula 2013:12].

Nkonde's sentiments reaffirm the gravity of the problem of illegal mining and the economic reasons behind the activity. Foreign nationals have also been implicated in the illegal mining scheme in the Copperbelt. For example, according to Blanchard and Mfula [2017], on 3 June 2017 the police in Chingola town in the Copperbelt "detained 31 Chinese nationals for illegal mining". In some cases, small scale miners acquire mining licences and then surrender them to foreigners, a practice which has allowed foreigners to explore and process mineral deposits and illegally export them out of the country without payment to the government, following the law and other mining regulations. Most illegal miners sell their illegally mined copper ore and other mineral deposits to business syndicates who have illegal storage warehouses in towns such Chingola and Kitwe [Mikula 2013:13]. Some illegal warehouse owners have scales, mineral analysis equipment, processing machines and other tools which help them to process the illegally mined minerals and quarried stones. From such warehouses, the copper ore and other mineral deposits and precious stones are then exported.

Illegal Quarrying

Although the quarrying of sand, limestone, gravel and hard rock is another form of illegal mining in the Copperbelt province, academic and media literature on the issue indicates that such activities continue to be concentrated in Lusaka province. Quarrying for the purpose of building material exists in villages and on the outskirts of towns in the Copperbelt though at a low level. Due to high levels of poverty and unemployment, quarrying continues to be practiced in the Copperbelt where the finished products such as crushed stones are then sold or used by illegal miners themselves for the construction of houses and other buildings. As with the illegal mining of minerals, the most rudimentary form of hard rock quarrying by illegal operations involves the use of simple hand tools such as shovels, hoes, flat big stones, wheelbarrows and picks [Nyumbu 2013:115].

The environmental impact caused by illegal mining in the Copperbelt province results from illegal miners not following mining legislation, such as the Mines and Minerals Development Act of 2015 (amended in 2016); Mines and Minerals (Environmental) Regulations of 1997; the Environmental Management Act No. 12 of 2011; and the Mines Acquisition (Special Provisions) No. 2 Act. In the Copperbelt province, there has been an enormous environmental impact on the land caused by illegal mineral mining and sand, gravel and hard rock quarrying. These illegal mining activities are motivated by high levels of unemployment, poverty and the lack of education and awareness of the devastating impact these mining activities have on the environment. Nevertheless, it is beyond the scope of this paper to discuss whether such reasons can be used to justify illegal mining activities on the Copperbelt.



An aesthetic specimen of an elongated, spinel-twinned copper crystal spearpoint with attached, flattened copper crystals. The piece looks like a jet fighter and is from the less well-known Mufulira Mine of Zambia.

Impact of Illegal Mining of Minerals on Land

Illegal mining operations result in land, soil and vegetation disturbances including habitat loss. The most common forms of illegal mining of minerals with a serious negative impact on land concerns the digging of working pits, sluices and tunnels. In the process, topsoil is removed, and a variety of plant species are cleared for surface mining activities where large pits are dug [Chipatu 2011:15]. Sometimes, these tunnels are started far from an established mine for the purposes of mineral theft. In April 2013, two illegal miners from Chiwempala in Chingola died after the tunnel in which they were working collapsed following heavy rains. Regarding the incident, Mary Tembo, Copperbelt Police Commissioner, reported that "during the course of their work, it started raining. Unfortunately, water entered the tunnel in which the two illegal miners were, and the soil got wet and collapsed on them" [Lusaka Times 2013].

Similarly, in October 2014, an illegal miner died in Chingola while two others had to be "rescued by their colleagues after being trapped in a tunnel which collapsed on them" [Nkombo & Nkweto 2014]. These incidents demonstrate the seriousness of illegal mining with regard to

negative impact on land, many plant species and human life. For instance, Mikula [2013:12] quotes Dickson Nkonde, an illegal miner, who affirmed that "we dig even one-kilometre tunnels and many others branching out". This activity can sometime take days, weeks or even months. Because most illegal miners have little or no knowledge and training in mining, sometimes no mineral deposits are found after digging for a long time, although the immense damage on land and soil remains. The tunnels, pits and sluices are dug without any concern for the damage being made to the environment because they are "dug haphazardly and remain uncovered even after their operations" [Appiah 1998:210].

An analysis of the existing scholarly and media literature on illegal mining in the Copperbelt shows that not only is the soil waste dug out and left on the surface but also that the pits, tunnels or sluices are themselves left uncovered, the soil polluted and the land damaged. As Kambani [2003:144] asserts, "large volumes of waste piles are left after mining since no back-filling or land restoration is undertaken". Because no proper precautionary measures are undertaken, areas where illegal mining occurs are often cleared, rendering the land bare, thus promoting soil erosion, land degradation and deforestation. According to Mensah [2015:89], in some cases illegal miners clear huge patches of forest for rest and recreation after long work days. Furthermore, elemental mercury is used by illegal miners to mine minerals such as gold by mixing mercury with gold-containing materials to form a mercury-gold amalgam. This product is "then heated, vaporizing the mercury to obtain the gold", resulting in highly contaminated soils [United States Environmental Protection Agency 2018].

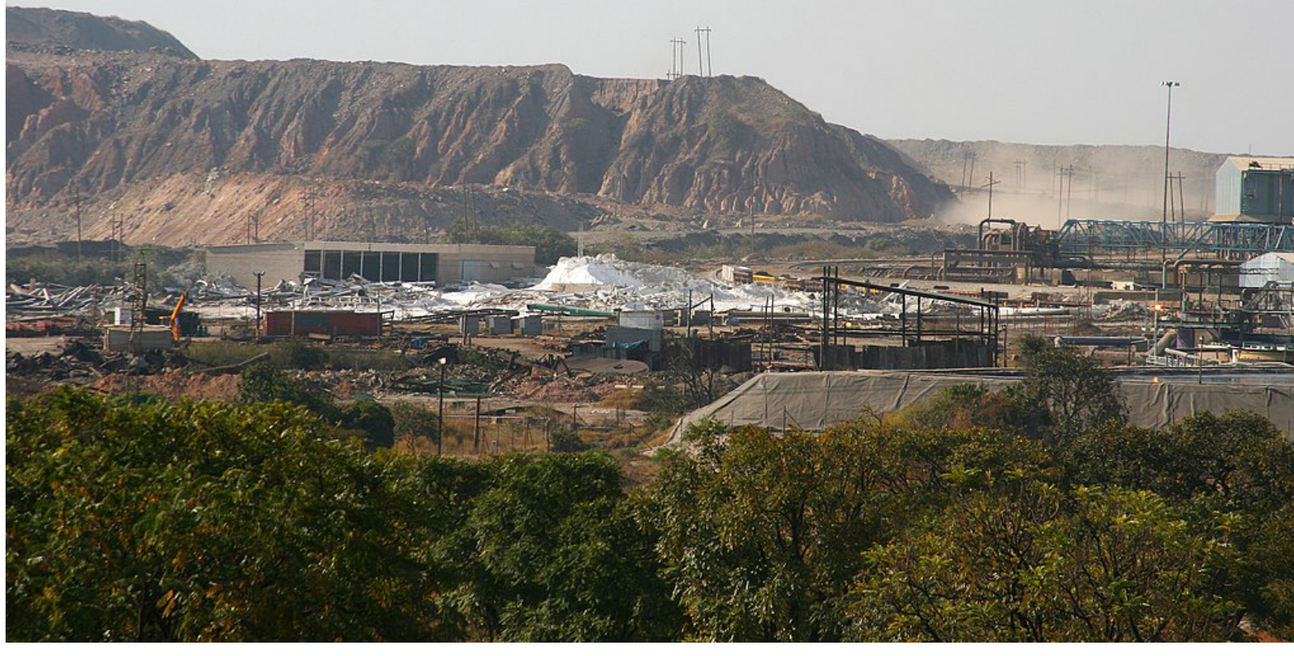
Generally, illegal mining operations prevent soil and plant rehabilitation. According to Lindahl [2014:7], there were more than 10 000 hectares in total that cover mineral wastes which are linked to historical mining operations in the Copperbelt by 2014. The Mines and Minerals (Environmental) Regulations of 1997 requires that formal mines rehabilitate the mined land upon mine closure, or the dump sites based on the Environmental Impact Assessment. Illegal mining activities, despite the unchanging socio-economic factors dictating it have continued to disturb the rehabilitation and decommissioning of waste mine dumps and closed mine sites. For example, waste is dumped and "large tracts of derelict land are created" [Chipatu 2011:15]. When illegal miners reclaim mineral deposits on old mining legacy sites, the process of rehabilitation is disturbed, the levelled ground is again dug up, and vegetation growth is delayed. Because the mine-waste dumps and old mines are already damaged and a risk to the environment, illegal mining operations on these sites increase the chances of soil erosion and could cause the land to suffer permanent damage.

According to the findings of the Mining, Minerals and Sustainable Development research project concluded in 2002, the waste generated by mining activities has the potential to reduce the land's productivity [Starke 2003:12]. In the Copperbelt, land productivity has been negatively affected, both agriculturally and endemically. Furthermore, the illegal mining of minerals on the Copperbelt continues to lead to the contamination of top soil due to the accumulation of metals such as copper in the soil. Particles of mineral deposits displaced or discarded together with soil waste by illegal miners contaminate large areas of land as they are carried away when it rains. Furthermore, Mensah [2015:89] contends that explosives sometimes used by illegal miners adversely affects the soil because "important soil organisms have been destroyed, stable soil aggregates disrupted, and eventually depriving the soil of organic matter". The dug soil which is ditched so often remains hostile to vegetation for many years due to the mixture of chemical, physical and biological elements.

Impact of Illegal Quarrying on Land

Like the illegal mining of minerals, quarrying also has a serious impact on the land. This is especially the case when more advanced techniques such as blasting with explosives, drilling and tyre burning to easily crack the rocks are used with enormous negative effects on the land concerned [Kambani 2003:144]. Such activities leave huge pits, trenches and ditches, which are then abandoned without any attempt at rehabilitation through refilling after the operations. In their empirical research, Muyunda and Yangsheng [2008:239] found that illegal quarrying leads to "landscape and land degradation, the destruction of roads and loss of value of the land", including "soil erosion due to change of the elevation of the land" in many parts of Zambia. Several large and unsightly pits and trenches through illegal quarrying have contributed to land degradation and reduced surface soil quality.

Moreover, vegetation growth is hampered and land damage through pits, gullies and trenches is caused. According to Eshiwani [2014:32], "quarrying has a lasting effect on the environment in that most of the quarries leave scars on the earth surface" since illegal miners are "unable to reclaim the land to make it productive again as it was before". Due to the lack of advanced equipment, illegal miners who are involved in quarrying never attempt to reclaim or refill the pits and trenches thereby leading to further degradation of the landscape. Because this form of illegal mining in the Copperbelt employs wasteful working practices, quarrying produces "enormous quantities of waste that can have deleterious impacts for decades" since no rehabilitation is done on the deteriorated land [Ming'ate 2016:2]. Stone crushers leave enormous heaps of soil and discarded stones after their operations.



Nchanga copper mine near Chingola.

Government's Response to the Ecological Crisis and Challenges

Constructive responses from the government regarding environmental degradation and pollution has primarily been through policy-making and implementation. The Zambian government continues to respond to the ecological crisis amid the ongoing environmental degradation and excess pollution especially in the Copperbelt province. For example, the formation of governmental bodies on the environment, the various environmental legislations, laws and other initiatives reaffirm the government's determination. However, there have been many challenges such as poor implementation of the laws and regulations, poor collaboration of the local communities with the government and economic issues which have negatively affected the government's efforts effectively to respond to environmental problems which continue to worsen.

Since 1990's, several agencies and forums have been created to advise the government on environmental issues and ensure that environmental legislation is implemented both at higher and lower levels. The establishment of the Environmental Council Zambia (ECZ) in 1992 as a coordinating, decision making and implementation body for all initiatives, programmes and projects that are geared towards the protection of the environment and atmosphere was a great success. When the ECZ was formed, one of its primary duties was to foresee the implementation of the Environmental Protection and Pollution Control Act of 1990. Before the Environmental Protection and Pollution Control Act (EPPCA) of 1990 was passed, individual industries and mines had to monitor pollution in their respective areas of operation. Regulations such as the Factories Act, the Town and Country Planning Act of 1980 and the Mines and Mineral Act merely guide respective organisations in the control and monitoring of pollution, which was highly ineffective [Osei-Hwedie 1996:67].

The enforcement of the Environmental Protection and Pollution Control Act of 1990 was therefore a breakthrough in the care and protection of the environment. The Act sought extensively to reduce environmental damage, especially in the Copperbelt province where pollution has been extreme. According to Osei-Hwedie [996:67], the Act provides for the "regulations for protection of the environment and control of pollution" and the need to establish structures that would spearhead the implementation of environmental legislation. The Act also highlights "offences and penalties of polluters outlined in sections dealing with water, air, noise or chemical pollution" [Osei-Hwedie 1996:67]. Further, the Act "sets environmental quality standards and makes the polluter responsible for meeting them" and "all effluents and emissions from mining operations are regulated through a system of permits, licenses and fines" [Chipatu 2011:26]. Other regulations concerning the environment such as the Mineral Environmental Regulations of 1997, the Mines and Minerals Environmental Regulations of 2008, the Environmental Impact Assessment Regulation (EIAR) of 1997 and the Environmental Management (Licencing Regulations 2013) have been enacted and amended by the government over the years. According to Lubinda [2009:8], in 2002 the ECZ affirmed that its mission is to:

> **"Regulate and coordinate environmental management, promote awareness, and ensure environmental protection through enforcement of regulations and the prevention and control of pollution in support of sustainable development – so as to provide for the health and welfare of persons, animals, plants and the environment of Zambia."**

As indicated, the Environmental Council Zambia (ECZ) which in 2011 was renamed the Zambia Environmental Management Agency (ZEMA) executes its mandate for control of atmospheric pollution and protection of the environment. It manages the implementation of projects that provide research on environmental issues such as the Zambia Environmental Information Network and the National Implementation Plans on Persistent Organic Pollutants project. Furthermore, according to the Zambian Convention on Biological Diversity [2018, among other core functions, ZEMA seeks to:

> **"(1) Draw up and enforce regulations related to water, air and noise pollution, pesticides and toxic substances, waste management and natural resources management; (2) advise the Government on the formulation of policies related to good management of natural resources and environment, and (3) advise on all matters relating to Environment conservation, protection and pollution control, including necessary policies, research investigations and training"**

ZEMA has a very broad and appealing environmental management mandate. To achieve its objectives, it has created partnerships with individuals, communities, national and global organisations with the aim of eradicating environmental problems and ensuring a safe and healthy environment for all. It also continues to act as a strong agency which advises the private sector and the government on issues relating to water, air and land pollution, environmental management and the conservation of biodiversity. Moreover, ZEMA ensures that environmental concerns are integrated in national planning schemes and that environmental concerns are publicised through the dissemination of information, awareness programs and promotion of research and general training [Zambia Environmental Management Agency 2011]. The creation of environmental agencies such as ZEMA has helped the government in its attempts to deal with various environmental problems including those resulting from illegal mining practices. Some of ZEMA's networks and collaborator-organisations which are spread throughout the country include the Impact Assessment Association of Zambia, Zambia Copperbelt Environment Project, and the Zambia National Climate Change Secretariat.

Furthermore, the government has responded to environmental degradation through the enactment of strict laws and regulations which are meant to promote and sensitise people of the need to safeguard a healthy and safe environment and atmosphere. For example, on 30 June 2009, the government launched a National Environment Policy through the Ministry of Tourism, Environment and Natural Resources "to provide a framework for the management of Zambia's environment and natural resources" and promote "sustainable economic development and protection of the environment by ensuring that all economic activities being conducted do not undermine the balance of the ecosystem" [Lusaka Times 2009].

The implementation of the policy resulted in several sustainable development projects and programmes concerning natural resources and environmental issues. Apart from environmental policies, the Environmental Management Act of 2011 upholds the centrality of a safe, clean and healthy environment. It contains general principles that are meant to regulate environmental management and reaffirm the citizens' duty to protect the environment. Section 4 of the Environmental Management Act of 2011 obliges any human activity on the environment to be subjected to environmental auditing and monitoring, and "the person responsible for any environmental degradation to restore the degraded environment, as far as practicable, to its condition immediately prior to the damage" [Zambia Environmental Management Agency 2011]. The government has also enacted strict laws in the mining sector which are partly meant to reduce the environmental problems caused by illegal mining practices. If one is found, one is liable to conviction and may be fined with an extensive penalty or be imprisoned for more than seven years [Zambia Environmental Management Agency 2011].

The strict legislation on environment shows that the government considers the need to protect nature, biodiversity and the atmosphere seriously. Illegal miners fail to comply with environmental legislation, since they engage in unlicensed mining activities without having undertaken any environmental impact assessment or considered the negative effect of their activities on land and soil. The government, through law enforcement agencies and the police, have, in recent years, fined or arrested several illegal miners. For example, in March 2018, Mines and Minerals Development Minister Richard Musukwa warned that "government will not tolerate any illegal miners in Zambia and that all mining operations must follow the correct procedure by owning licences" [Tumfweko 2018]. Apart from laws and legislations, the arrests and fining of illegal miners continue to help the government prevent the escalating negative environmental impacts of illegal mining.

ZAMBIA ENVIRONMENTAL MANAGEMENT AGENCY

Despite the compressive environmental legal system and governmental bodies such as ZEMA which are meant to protect the environment, there are challenges to the implementation of such polices and laws. Firstly, the problem concerning the lack of integrity and responsibility on the part of government officials responsible for implementing environmental policies has not been fully addressed. For example, the issues of corruption and nepotism have highly affected the adequate implementation and materialisation of environmental legislation [Chibuye 2015:152]. This shows that although the departments and agencies that have been created, together with environmental legislation, has highly helped the government to respond to the problems of pollution and environmental degradation, its ability to implement the regulations has been hampered.

Secondly, legislation often targets large corporate bodies and partnerships to the extent that small-scale firms such those belonging to illegal miners remain 'untouchable'. The small-scale sources of environmental degradation such as illegal mining are sometimes ignored by institutions that are meant to safeguard the environment. For example, the need for the environmental impact assessment as affirmed by the Mines and Minerals Act is often done in big corporate mining bodies rather than in small scale mining operations. Despite the few arrests that have been made so far, the local police do not strictly monitor or search for illegal mining operations in the Copperbelt. Thirdly, the lack of sufficient income has highly affected government bodies which are meant to protect the environment. The government continues to suffer from inadequate sources of income and other resources for conducting environmental impact assessments, setting up viable projects, workshops and programmes which would enable it to acquire substantial control of the environmental crisis [Murekezi 2004:46].

Finally, the efforts being made by the government have not received positive responses from the community at the local level in the Copperbelt province. Musonda [2016:16] bemoans that while there have been protests and other attempts on the part of the community to challenge certain companies and mines which cause pollution and environmental damage, there have been "*divisions in society which weakens the community's collective capacity to mobilise against pollution*". Among other factors, poverty and the fear of losing employment from the respective companies and mines that cause pollution and environmental degradation continue to perpetuate the lack of unity in most communities. In his interview with residents of Kankoyo Township in Mufulira regarding the community's mass-protest initiatives against companies and mines that cause pollution, one of Musonda's [2016:16] respondents replied: "*you can participate in the protests, but what happens when the company sees you? You get fired, and when you get fired, no salary, the children suffer…I wouldn't want to lose my job*". The presence of environmental legislation and governmental bodies which are meant to control pollution and environmental degradation has met several challenges such as corruption and the poor economy.

"you can participate in the protests, but what happens when the company sees you? You get fired, and when you get fired, no salary, the children suffer…I wouldn't want to lose my job" Musonda

Environmental Justice and Ecotheology

The negative impacts of illegal mining and other human activities which cause environmental degradation and pollution in the Copperbelt raise many questions. How can one employ an eco-theological perspective to respond to the ecological crisis being engineered by illegal mining in Zambia, especially in the Copperbelt province? How is the understanding of the earth as a unified community and household of God relevant to the ecological crisis? Can the idea of stewardship be used to reaffirm the need for humanity's care for the environment? Such questions concern vital themes within Christian ecology which espouse not only justice for the environment but also the need for humanity's respect of nature's intrinsic value and dignity. Generally, the ecological crisis can be partly tackled from the perspective of environmental justice and the notion of the earth as our common home which is rooted in eco-theology within the Christian tradition.

Call for Environmental Justice

Ecological or environmental justice highlights a significant link between the notion of justice and the ecosystems. While the term 'eco-justice' was coined in the early 1970s, the concept of environmental justice emerged in the early 1980s in the United States [Bell 2014:15]. Originally, the latter was linked to the Environmental Justice Movement which stressed the need for equal distribution of environmental burdens and benefits, and the impartial participation of all people in the environmental policy-making processes and implementation. Both 'ecological justice' and 'environmental justice' concepts continue to be used in religious and secular spheres. Human dominance over nature through illicit environmental practices has led to a litany of ecological problems.

Rather than being a relationship of equals, the relationship between nature and human beings is underlined by human exploitation and domination over nature. Thus, one ought to reaffirm a "*fair and caring treatment of natural systems and nonhuman creatures*" [Gibson 2012:21] since "*justice as a virtue needs to be an integral part of a conception of ecological justice in terms of responsibility for establishing und sustaining ecologically just institutions*" [Glotzbach 2011:19]. As such, the unjust treatment of nature can be considered intolerable, regardless of the economic aspect involved. Ecological justice entails not only being held responsible for the damage being done to the environment but also taking strenuous measures both theoretically through the enactment of environmental laws and policies, and practically, by ensuring that such regulations are applied both at the higher and lower level.

According to the First National People of Colour Environmental Leadership Summit held in October 1991, "environmental justice affirms the sacredness of Mother Earth, ecological unity and the interdependence of all species, and the right to be free from ecological destruction" and that "*governmental acts of environmental injustice [are] a violation of international law, the Universal Declaration on Human Rights, and the United Nations Convention on Genocide*" [Merchant 2005:174-178]. The affirmed principles of environmental justice critique the shallow environmentalism which does not strongly advocate a healthy ecology. The notion of justice presupposes just relationships since uneven patterns of domination are unjust. The environmental impact of illegal mining in the Copperbelt shows a disparity in the relationship between nature and human beings.

Brinkmann [2016:222] quotes Pope John Paul II who affirmed that world peace is threatened by many things including a lack of respect for nature and the "*plundering of natural resources*". The statement reiterates the need for respect of nature and its intrinsic worth which required addressing the environmental discrimination happening in the Copperbelt province. If both nature and people are important in themselves, then there might be a need to establish a code of 'ecological rights' similar to the codes of human rights [Rajotte 1992:103]. Although the issue of nature's intrinsic worth brings about the question of whether nonhuman creation has rights, if all animate and inanimate creatures have "*intrinsic value (irrespective of whether humans recognise that), humans as moral agents have a duty to protect them, regardless of whether rights language is applicable to such creatures*" [Conradie 2011:65]. The position that all creation has intrinsic value entails that environmental discrimination which continues to be apparent in the negligence and carelessness of illegal miners call for an urgent need to foster justice towards the environment.

There is a need for ecological sustainability whereby environmentally fitting and favourable living and working habits are developed

which enable nonhuman life to flourish and ecologically appropriate technology and means of using natural resources are utilised. Boff [1997:8] argues that as human beings, we treat nature unjustly, when we "*subjugate nature, press it into delivering its secrets, tie it to our service and make it our slave*". Because sometimes human beings perceive themselves as 'above' other created things, they reduce "other" created things into instruments of human progress and happiness. There is a need for environmental liberation and freedom from human oppression since "*the God who liberates and saves is the same God who created the universe, and these two divine ways of acting are intimately and inseparably connected*" [Laudato Si' 73]. One ought to confront the systems that exploit and oppress the natural world thereby causing undesirable environmental degradation and pollution.

The emphasis is not on the equal distribution or sharing of earth's resources but on ensuring that nature is granted the ecological dignity it deserves by not being abused, distorted or degraded. Furthermore, ecological justice requires recognising in "*other creatures and natural systems the claim to be respected and valued and taken into account in societal arrangements*" [Gibson 2004:34]. The need to care for the environment cannot be considered as 'doing a favour to the environment' since biblical exegesis shows that the earth and all it contains belongs to God who is the sole creator; and that human beings are part of God's creation. One ought to consider the fact that "*our Creator has given us the gift of creation: the air we breathe, the water that sustains life, the climate and environment we share-all of which God created and found 'very good*"' [Wenski 2012:498]. All earth's inhabitants are dependent on God's care and sustenance. The human response to the ecological crisis is a sign of respect for all of God's creation which has intrinsic ecological dignity independent of humanity.

Earth as Our Common Homeland

The ecological crisis in the Copperbelt requires actions and responses that are radical to the polluting, destructive and primitive human relationship with nature. Such a disjointed relationship is partly rooted in the dualistic and hierarchical dichotomy between humanity and the world; with human beings as subjects and nature as the object. This anthropocentric view which places human beings at the centre of other created things means that everything starts with humans, returns to them and is at their service. As Boff [1997:70] puts it, the main goal is the '*dominium terrae*', to conquer and dominate the earth. This is partly based on the flawed view that everything exists for human beings and that "*nothing has otherness and meaning apart from the human being*" [Boff 1997:70].

Human beings feel that they are outside and above nature. Such an erroneous view is captured by the statement of Protagoras of Abdera (c. 485-10 BCE) who affirmed that 'the human being is the measure of all things.' This relates to the attitude toward natural resources and the environment that "*nature does not have an intrinsic value; it is only valuable in so far as it can be utilised by humans for various purposes, for example for farming, mining and energy or recreation*" [Conradie 2011:20]. Such corrupt, biased and manipulative views call for human reconciliation with nature so as to enhance the common good of the planet earth as a whole. Challenging the dualism view of human beings and nature necessitate living by shalom which exhibits peaceable values such as integration, completeness and a unified earth whereby everything moves together in dynamic harmony. For Moules [2018], *shalom* proclaims creation's destiny, a renewed creation, and challenges injustice that causes deformity and destruction to the earth.

Moules's view purports the universal principle that all created things constitute an immense cosmos and planetary unified community which ought to coexist in harmony and solidarity due to the interdependence, interconnectedness, and the fact that all earth's creatures have the same origin and destiny. This echoes the message of Jesus who "*preached a gospel which was based on justice, sharing, caring, love, rendering services, solidarity and living in harmony with all God's creation*" [Gitau 2000:151]. Christ's message emphasised the values of God's kingdom which was based on the integrity and harmony of the entire cosmos. Since Christians draw their vision from Christ who is the centre of creation, "*the destruction of any part of Creation, especially the extinction of species, defaces the image of Christ which is etched in creation*" [Christiansen 1996:316].

Moreover, caring for the earth requires metaphorically perceiving the universe as God's body. The theological insight which perceives the earth as God's body calls for a radical healing of the environment in the Copperbelt. Such a view challenges the unjustified way in which human beings relate to the environment since "*God suffers when any part of the Earth suffers; God rejoices when any part of the universe experience ecstasy and fulfilment*" [Wright 1993:87]. Human beings share the same destiny with all earth's creatures, since the common good of the universe extends to both human and nonhuman, inanimate and animate things.

Understanding the common good and relatedness of the entire universe and all it contains reaffirms the need for solidarity and reunion of all members of the earth's community. The notion of the earth as a unified community which stresses the idea that we are all members of the same household of God underlines the fact that the survival of human beings is based on the existence of the thriving natural world. This element is strongly captured by *Laudato Si'* which calls for an inclusive dialogue on the shaping and caring of the earth: 'our common home'. In the encyclical, Pope Francis appeals to the world to resolve the universal ecological crisis which requires looking at our common future which we share with the whole of creation collectively and mutually. Pope Francis affirms that although 'human life is grounded in three fundamental and closely intertwined relationships: with God, with our neighbour and with the earth itself' it is pitiful that "*these three vital relationships have been broken, both outwardly and within us. This rupture is sin*" [Laudato Si' 66]. There is a need to repair the disrupted universal connectedness of human beings with the whole universe.

The motif of the earth as our common home which pictures creation as a vast public household and community of equals upholds the inclusiveness and oneness of all creation rooted in solidarity with single ultimate purpose. Creating an equal relationship between human beings and other species of the earth require that "*all types of stewardship, relationship, and carrying for the earth are part of our responsibility*" [Berry 1991:58]. Human stewardship of the earth is geared towards the creation of harmony not only between human beings and creation, but also between human beings and God who is the absolute Lord of the whole universe. Human stewardship should not be employed to mean humanity's separation from the rest of the natural world; that is, human beings are there to manage or control nature. Being a steward of the earth, which is God's body requires that one become a servant, thereby setting human beings as part of creation and participants in God's work of creating and recreating.

Understanding stewardship as the human participation in the divine creation and recreation helps us to care for the environment as our common home. This prevents one from continuing to exploit and damage the earth based on the justification that God has given human beings the authority to "*fill the earth and subdue it*" [Genesis 1:28 NRSV]. The theology of stewardship and shalom is against domination since it suggests an environmentally sensitive and harmonious relationship between human beings and the rest of creation. This reaffirms Pope Benedict XVI's teaching that the "*covenant between human beings and the environment should mirror the creative love of God*" [Schaefer 2013:33]. The covenantal aspect helps one to affirm real sustainability and unity of creation as a whole rooted in the values of stewardship and interconnectedness.

A genuine Christian ecology challenges the dualistic and anthropocentric view which places human beings as masters of nonhuman creatures. This view portrays human beings as being there to dominate and abuse the environment which might be considered as mere object, instrument and means to a human end. By recognising the intrinsic value and dignity of nature based on the idea that all created things are one community with a common goal and destiny, human beings can be more caring and loving of the environment. Humanity has the responsibility of protecting the environment for the sake of its intrinsic worth, connectedness with nature and for future generations.

Conclusion

The paper discussed the environmental impacts of illegal mining activities in the Copperbelt province of Zambia and attempted to offer a response to the crisis from an eco-theological perspective. By exploring illegal mining and its impacts on land in the Copperbelt, the paper demonstrated that it is a serious issue which requires urgent significant response from both government and society. Although there have been responses and attempts have been made by the government and society to curb the problem, such efforts continue to be inadequate. This inadequacy is confirmed by the worsening ecological crisis due to environmental damage and pollution being caused by illegal mining practices and many other forms of human exploitation and disruption of nature through mining, agriculture, energy and recreation. The final part of the paper established that a radical eco-theology challenges the dualistic, hierarchical and anthropocentric view which places human beings at the centre of all creation. The notion of environmental justice reaffirms nature's intrinsic value which ought to be respected, thereby challenging the biased view that human beings are above the rest of creation.

Moreover, since all human and nonhuman creation is part of the unified community housed by the earth our common home, this calls for the principles of shalom and stewardship which reaffirm the interconnectedness of all that exists. Biblical exegeses done from the perspective of modern Christian ecology upholds the oneness of all creation under the one God who is the absolute Lord of all creation. This calls for solidarity, love and care for all creation. This requires a radical rejection of the ill-conceived theology which puts human beings as masters of the universe and nature as an object merely to be abused and used in a manner as human beings see fit. The universe is one developing reality of which we are all part, in which we all carry out our missions and through which we all come into existence and perish. Human beings are truly connected with plants, animals, biodiversity, the cosmos, galaxies and all creation. The conception of interconnectedness and the integrity of all creation fight against humanity's dominance over "other" created things and thus bring liberation to nature.

Christianity, based on its ecological teachings, can be a rich and appealing instrument for imparting awareness of the need to care for the environment. Due to its insistence on the care for all creation, environmental justice and interconnectedness, the Church can be a true prophetic voice in the protection of the helpless environment. I maintain that people ought to realise the undeniable relationship between human wellbeing and that of the environment – the environment must be safeguarded and cared for, such that any abuse towards it ought to be eliminated. Instead of advocating human domination over nature, one ought to care for the environment as a good steward not only due to its intrinsic value but also because the earth is our common home – there is a profound connection between nature and human life.

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