East African Journal of Education and Social Sciences
EAJESS January-February 2022, Vol. 3, No. 1, pp. 71-82
ISSN: 2714-2132 (Online), 2714-2183 (Print). Published by G-Card
DOI: https://doi.org/10.46606/eajess2022v03i01.0148
URL: http://eajess.ac.tz

Nature, Causes and Development Implications of Ecological Injustice in Uganda

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Abstract*:* Uganda is one of the developing countries in the world that experience ecological injustice emanating from unsustainable use of natural resources. This study attempted to reveal the nature, causes and implications of ecological injustices in Uganda through the descriptive design. The target population was 300 Senior Officers from UWA, NEMA, NFA and NFA from whom 30 interviews were done. Stratified simple and random sampling techniques were used to get the 30 respondents taking cognizance of their seniority, gender and Regularity Authority of Employment. Documents enabled access to quantitative data while interviews provided qualitative data. The results revealed an existing over exploitation of natural resources like forests, fisheries, land, wetlands and wildlife. This is caused by poverty, weak enforcement, corruption, increasing population and moral degeneration which have resulted into in low agricultural output, climate change and loss of forests, fish, wildlife and biodiversity. In conclusion, Uganda is experiencing ecological injustices that are not a natural phenomenon but politically, economically and socially constructed. It is possible to deconstruct them now in order to avoid desertification as well as imbalance of animals and plants in the ecological system due to exhaustion through research, innovation, awareness, enforcement, legislation and energy development.

Keywords: Ecological Injustice; Ecological Justice; Development Implications; Uganda

How to cite: Lubaale, G. **(**2022). Nature, Causes and Development Implications of Ecological Injustice in Uganda. East African Journal of Education and Social Sciences 3(1), 71-82. Doi: https://doi.org/10.46606/eajess2022v03i01.0148.

Introduction

Ecological injustice is excessive abuse of natural resources which harms the ecological systems, hence creating ecological imbalance. In other words, it is the unequitable distribution of costs and benefits obtained from the use of natural resources by the present while jeopardizing needs of the future generation (Lakna, 2017).

Ecological injustice is a global challenge that threatens the holistic development of the world because of the separation of ethics from development (Neary, 2021). Economic growth is often promoted at the cost of ecological balance and pollution which have resulted into big losses of productivity in the world (Todaro, 2020).

More than one and half billion people are directly dependent on land that is steadily degrading, as 169 countries declared at the United Nations General Assembly in 2007 to be affected by rising desertification. Every year, 75 billion tons of productive soil is lost due to land degradation and land deterioration which results in a loss of USD 42 billion annually (United Nations, 2007). Half of the forests that once covered 46 percent of the earth's geographical surface have vanished, hence causing desertification and soil degradation that pose a hazard to approximately a quarter of the world's

land surface. Today, the pace of land degradation is 30 to 35 times than the historical rate. More than 250 million people are directly affected by desertification, with another 1 billion being at risk. In the next 100 years, global warming is expected to raise the earth's temperature by 3 degrees Celsius (5.4 degrees Fahrenheit), resulting in negative consequences for the environment and human society, including widespread species extinction, ecosystem damage, flooding of populated human settlements, and an increase in natural disasters. An estimate of 40 million individuals have been forcibly evicted from their homes in various parts of the world due to Ecological Injustice results (Reddy, 2021). Such global statistics are evident in Uganda.

Baxter's (2005) Theory of Ecological Justice explains that ecological justice is the fair treatment of all species other than homo sapiens in their claim to a portion of the earth's resources. It investigated the nature of justice claims as they apply to creatures of various degrees of complexity as well as the institutional arrangements required to integrate ecological justice claims into human decision-making. This theory brought about comprehension of ecological justice as the need to apply principles of use and distribution of all things in the ecosystem because each has value to the other either singularly or collectively, hence achieving positive results in the development process.

Ecology explores the interactions of plants, animals, people and their environments as well as the balances that exist between them. As a result, ecological justice is defined as the equitable distribution of costs and benefits obtained from the use of natural resources in order to ensure minimum welfare standards to all current human beings without jeopardizing future generation (Lakna, 2017). Development is growing and becoming more advanced in all spheres of life: political, economic and social. It is about positive changes and improvement in all faculties of life (Lubaale, 2020). Development thrives largely on ecological balance and underdevelopment is a result of ecological imbalances. Therefore ecological injustices interfere with holistic development because of imbalances in the ecological system which creates huge development gaps that can be avoided.

Uganda is one of the landlocked countries in the East African Community (EAC) and is one of Africa's 56 states. There are several lakes including Lake Victoria, which covers 68,100 square kilometers and is the world's second largest lake, as well as rivers and their products, such as the Nile, which is 6,700 kilometers long. These are important in the development process. Forests, vegetation, mountains and rift valleys all play an important role in ecological justice, tourism, and agriculture. Furthermore, there are a variety of high-nutrient foods and crops as well as therapeutic plants and animals, a diverse bio-diversity and a pleasant environment in Uganda (Lubaale, 2015).

The government has established resource regulatory agencies such as the National Fisheries Authority (NFA), National Forest Authority (NFA), National Environment Management Authority (NEMA) and Uganda Wild Life Authority (UWA) among others to engage in research and innovation to in order to promote ecological justice. However, forestry cover has decreased from 45 percent in 1890 to 20.3 percent of Uganda's total land area (National Forest Authority, 2016). With annual deforestation estimated at 1%, this region has shrunk from 1.5 million hectares in 2010 to around 1.2 million hectares in 2020. All these are happening in the presence of the regulatory authorities and law enforcement institutions which have a role to play to stop ecological injustices.

Therefore this study sought to establish the nature of ecological injustices, causes and development implications on the development process in Uganda as evident in the following research questions:

1. What is the nature of ecological injustice in Uganda?
2. What are the causes of ecological injustice in Uganda?
3. What are the development implications of ecological injustice on the development process in Uganda?

Literature Review

Ecological injustice leads to desertification, which is an ecosystem disruption of significant concern in many parts of the world due to a human-induced or the natural processes that negatively affect the ecosystem functions. As a result, the ecosystem's ability to take, store and recycle water, nutrients and energy is disrupted. Soil erosion, diminished biodiversity and the loss of productive capacity, such as the transition from forests to shrub lands or grassland to shrubs are the most prominent elements of desertification. Other potential losses as a result of human activity and climate change include the land's normal hydrologic function,

biological productivity and other ecosystem services (Neary 2021). Desertification impacts over one and half billion people and one-third of the earth's area (United Nations, 2007).

Environmental justice, according to Byrne, Leigh and Cecilia (2002) is one of the most contentious and essential themes in current social sciences which questions our understanding of environmental justice in a worldwide setting where global forces of technology and global market development are altering social life and the natural order. These shifts necessitate a thorough analysis of nature-society interactions. Modernization increasingly assigns modernity's dangers on people with the least power and the greatest sensitivity to environmental disaster. Traditional environmentalism, which focuses on criticism of humanity's effects on nature is insufficient to meet the challenges of globalization. It fails to explain the roots of persisting patterns of social injustice that accompany increasing environmental exploitation. As the capability for environmental damage grows, greater concerns about environmental injustice have surfaced, including risks to entire cultures, ways of life and ecologies. The contributors to this volume look at the connections between expanding patterns of environmental injustice and the structures and processes that underpin and shape the global political economy. Environmental injustice is examined in both the developed and developing worlds across a variety of civilizations. The global and local dimensions of the injustice are explored through case studies of climatic change, revolutionary ecology and environmental trade (Byrne, Leigh and Cecilia, 2002).

When it comes to supporting the ecological justice, we must be democratic, which requires a system of governance that is run by (parts of or the entire) population of a country through elected representatives. In other words, eco democracy, which is connected with earth democracy as well as eco justice or earth justice, all refer to political systems that respect the intrinsic dignity of human and nonhuman inclusion in order to promote ecological justice (Baxter, 2005; Kopnina, 2021). As a result, environmental justice is primarily a social justice issue, with a focus on equating connections and access resources among various social groups (Bird, 2007; Schlosberg, 2007) in order to ensure adequate and sustainable use. Ecological justice advocates, on the other hand, argue that non-human species should be considered ethically meaningful agents (Baxter, 2005) in promoting ecological justice.

We should resist the Industrocentric ideology which is a self-serving system that destroys cultural and biological variety while portraying living beings as merely a "resource" at the expense of both humans and nonhumans (Baxter, 2005; Kopnina, 2021), resulting in ecological imbalances. We should also refrain from focusing solely on consumption rather than addressing human population increase, which is likely to result in a constant need for additional resources from both the poor and the wealthy, pushing the earth's carrying capacity to its limit.

Environmental justice may include ecological justice (Schlosberg, 2007) or species justice (Baxter, 2005) from an ethical standpoint, although most typically, environmental justice excludes the environment or non-human animals as a moral concern. Essentially, the concept of justice is anthropocentric or human-centered (Kopnina, 2021). Baxter (2005) further asserts that environmental justice includes humans and non-humans and their interaction. As a result, ecological justice should ensure a fair distribution of eco resources in a sustainable manner for the present generation without jeopardizing future generations' needs while maintaining the ecosystem equilibrium.

Schlosberg (2017) examines justice in both environmental justice movements and environmental and ecological justice theories, with the central argument remaining that distributive conceptions of justice are necessary in order to embrace fairness in resources access. The development of a comprehensive and multi-faceted notion of justice that can be applied to both human and nonhuman natures in respect of using the environment is central in achieving ecological justice, which is the fundamental goal of these movements and theories.

Ecological Regulatory Authorities in Uganda

Uganda Wildlife Authority

Uganda Wildlife Authority (UWA) is a State authority agency with the responsibility to coordinate, monitor, regulate and supervise the wildlife in Uganda. UWA is in charge of developing wildlife policies, rules, regulations, standards and recommendations as well as advising the Ugandan government on wildlife management. The law stipulates severe penalties like paying a maximum fine of Shs20 billion or life imprisonment or both for committing any crimes involving wildlife species that

are nearly extinct like “roan antelopes, lions, hunting dogs, spotted and stripped hyenas, greater and lesser kudus, Ssese Island Sitatungas, Cheetahs, African elephants, Delaneys, mousses or critically endangered creatures like Impalas, Rwenzori duikers, Rothschild's giraffes, mountain gorilla and the common chimpanzee” (Uganda Wild Life Act, 2019).

The law has clauses for managing human-wildlife conflicts and compensation as well as doing commercial wildlife as a strategy to promote ecological justice (Uganda Wildlife Act, 2019). However, implementing ecological justice remains a challenge largely because of human activities as evident in the continuous poaching of animals and encroachment on the reserved land for wildlife in Uganda in a manner that is not sustainable.

National Forest Authority (NFA)

National Forest Authority (NFA) was launched on the 26th April 2004 with a mandate to manage Central Forest Reserves on a sustainable basis and to supply high quality forestry-related products and services to the government, local communities and the private sectors. NFA aims at ensuring an adequate forests stable ecology and prosperous economy of Uganda at all times. Forest cover in Uganda stands at about 1.9 million hectares (ha), which is 10% of the land cover area comprising both nature and plantations. “Natural forests” include both the Tropical High Forests (THF) and other naturally wooded lands that fall within the definition of “forest.” Forest-based Tourism and Ecotourism are key in NFA promotion because of their revenue generation and enhancing partnerships with the private sectors, Non-Government Organisations and international/local communities (National Forest Authority, 2004). However, implementing ecological justice remains a challenge largely because of human activities as evident in the continuous cutting of trees in Uganda in a manner that is not sustainable.

National Environment Management Authority

The National Environment Act, Cap. 153 established the National Environment Management Authority (NEMA) as a semi-autonomous agency in May 1995 and it became operational in December 1995 as the country's single public entity to organize, monitor, control and supervise the environmental issues. NEMA is in charge of developing environmental policies, rules, regulations, standards and recommendations as well as advising the Ugandan government on environmental management. NEMA also encourages the incorporation of environmental issues into development policies, plans, programs and projects in order to ensure proper environmental management and rational exploitation, hence fostering social-economic development and assuring long-term development (National Environment Management Authority, 1995). However, achieving ecological justice remains a difficulty, owing mostly to human actions, as seen by Uganda's continued use of natural resources in an unsustainable manner.

The National Fisheries Authority

The National Fisheries Authority **(**NFA) operates under the Fisheries Management Act of the year 1998, a non-commercial statutory authority. It majorly focuses on changing its corporate culture, becoming an effective regulator and chief supervisor of the advancement of the fisheries sector for maximized sustainable benefits to the people (National Fisheries Authority Act, 1998). However, achieving ecological justice remains difficult, owing to human activities such as overfishing and poor fishing techniques, which have resulted in decreased fish quality and quantity.

Methodology

Research Design

This study employed the mixed approach where a descriptive design was adopted given the desire to describe the ecological injustice situation. Documents enabled access to quantitative data while interviews provided qualitative data using documentary guides and interview guides.

Population and Sampling

The target audience was 300 Senior Officers from UWA, NEMA, NFA, and NFA from whom 30 interviews were done. Stratified simple random sampling technique was used to get the 30 respondents taking cognizance of their seniority, gender and Regularity Authority of Employment.

Validity of the instruments was ensured firstly by giving items to five experts in ecology who judged their appropriateness and their judgment was the basis for approval prior to collecting data. Secondly, for each item, the Content Validity Index (CVI) was determined, and those items with a score of less than 0.8 were modified till it was appropriate. The test-retest approach was used to determine the item's reliability. The Cronbach Alpha test score of 0.6 was ensured (Amin, 2005).

Findings and Discussion

This study was guided by three research questions especially in data analysis and results presentation:

Research Question 1: What is the nature of ecological injustice in Uganda?

This question endeavored to establish the nature of ecological injustices in Uganda in terms of damage, extinction and exhaustion in respect of forests, fish, climate, land, wetlands and wildlife/biodiversity

Deforestation: Forests make up around 20.3 percent of Uganda's land cover or over 1.5 million hectares of the country's total land area. With an annual rate of 1% deforestation, this area has decreased to about 1.2 million hectares in 2020. Each year, an estimated 800,000M3 of logs are cut, implying that the country's timber harvesting pace exceeds sustainable forest harvesting levels by a factor of four (4).

Table 1 illustrates that the forest estate has reduced from 24 percent of total land area in 1990 to 9 percent in 2015, according to NFA statistics. In terms of land area, 3.05 million hectares were lost over a 25-year period. About 2.2 million hectares of forests were lost while the forest estate outside PAs shrank from 68 percent of total forest land area in 1990 to 61 percent in 2005, then to 38 percent in 2015. This suggests that in just 25 years, nearly half of the unprotected forests had been removed.

Fish: With around 20% of its surface area covered by water, Uganda has enormous potential for both capture and aquaculture fisheries output. Uganda's fisheries landscape is made up of five large lakes namely Victoria, Kyoga, Albert, Edward, George, and Kazinga Channel, as well as 160 smaller lakes and rivers such as Albert Nile, swamps and floodplains, all of which are critical habitats, fish breeding, nursery grounds and suitable sites for fish farming. Uganda's fishery resources are diverse, with a wide range of aquatic settings and fish species.

Table 1: Forest Cover Statistics 1990-2015 (in hectares)

Forest ownership	Forest type	1990	2000	2005	2010	2015
PRIVATE	THF well stocked	172,274	127,022	79,789	50,662	20,439
	THF degraded	175,052	160,883	149,008	50,423	35,400
	Woodland including montane	2,971,763	2,258,873	1,948,534	945,221	605,146
	Plantation	12,000	7,000	11,000	19,000	37,000
Sub total		**3,331,090**	**2,553778**	**2,188,331**	**1,065,306**	**697,986**
PROTECTED	THF well stocked	419,456	549,140	419,972	431,259	410,449
	THF degraded	83,911	57,792	36,536	55,160	100,880
	Woodland including montane	1,028,027	842,756	907,752	703,113	556,464
	Plantation	18,000	15,000	21,000	38,000	64,000
Sub total		**1,549,394**	**1,464,688**	**1,385,260**	**1,227,532**	**1,131,793**
Grand total		**4,880,484**	**4,018,466**	**3,573,597**	**1,292,838**	**1,829,779**
% of total land area		24	20	17	11	9

Source: NFA data 2016

Exports to international markets, on the other hand, have recently fallen drastically, from 39,201 tons in 2005 to around 15,417 tons in 2010. This is primarily due to diminishing catches, dwindling stocks, overfishing, and pollution of the air, water, lands, and wetlands as well as a decline in forestry (Ministry of Agriculture, Animal Industry and Fisheries (2020).

Climate Change: Climate Change presents enormous challenges in the country. The National Adaptation Plan (United Nations, 2018) states that, 90% of Uganda's natural disasters are Climate related. Since 1990, the magnitude and frequency of droughts and floods has increased with over five million people directly affected. Over 800,000 Hectares of crops are destroyed by climate related effects annually inflicting losses of over 120bn Shillings. Urban flooding is also progressively becoming a serious challenge, especially in Kampala City. Given the poor urban planning and loss of green spaces, flooding events are becoming frequent which lead to loss of infrastructure, loss of lives and destruction of property. Extreme rainfall conditions and floods have led to secondary impacts of landslides, soil erosion, displacement, outbreaks of epidemics of animal and crop pests and diseases (United Nations, 2018).

Land: The world's population is expanding on the mountains, and basic farming techniques are causing significant soil erosion and land sliding on

mountain slopes. Landslides in 2016 on Mount Elgon and 2019 on Mount Rwenzori, for example, took the lives of many people and destroyed property. Given the human activities such as deforestation, wetland degradation and poor farming methods, there is visible loss in soil productivity, resulting in income losses to farmers in the range of USD 39 to 56 per hectare per year, resulting in soil erosion, landslides, floods, drought, heat as well as water, air and land pollution, hence low agricultural output. Furthermore, erosion is widespread throughout the country's highlands and other regions where 46.5% of the land area in 19 districts is suffering from serious soil erosion particularly those that are densely populated like Kabale, Kisoro, and Mbale where continuous cultivation on steep slopes has increased rill and sheet erosions (Nabalegwa, Asaba & Turyahabwe, 2016).

According to the ministry report, severe land degradation affects roughly 36% of Uganda, and extremely severe land degradation affects 10%. These land degradation zones are subjected to a variety of climate-related pressures and risks, as well as other human pressures such as deforestation and wetland encroachment (Ministry of Agriculture, Animal Industry and Fisheries (2020) resulting in low agricultural output.

Wetlands: Wetlands are locations where land and water meet and mingle. Such areas include open water, for example lakes and rivers, continuously flooded land like swamps, saturated land like bogs or seasonally inundated land like floodplains, roughly covering 13% of Uganda's total area**.** However, more recent estimates indicate that more than 7% of Uganda's original wetland area has been converted to other uses such as human settlement, road construction, forestry and agriculture land, all of which are incompatible with wetlands, resulting in further biodiversity loss. Furthermore, wetland resources in Uganda have decreased from 15% in 1994 to 10.9 percent of the country's total area during the 2008 mapping effort **(**Ministry of Water and Environment, 2015).

Wildlife/Biodiversity: Uganda is home to a diverse range of animal and plant species, including roan antelopes, lions, hunting dogs, spotted and stripped hyenas, Ssese Island Sitatungas, Cheetahs, African elephants, giraffes, mountain gorillas, chimpanzees, mountains, rainforests, deciduous bushlands and abundant freshwater resources. Bwindi Impenetrable National Park, Murchison Falls National Park and Queen Elizabeth National Park, among others, are under increasing strain from nearby communities, leaving natural life in a state of equilibrium (Uganda Wild Life Act, 2019). As a result, wildlife/biodiversity potential is rapidly dwindling due to government and citizen negligence and moral failure in protecting it from unreasonable human activities that harm the ecological system on which it depends, resulting in a loss of income, revenue, taxes, foreign exchange, and employment**.**

Research Question 2: What are the causes of ecological injustice in Uganda?

From the interviews, responses to this question were classified into five themes namely poverty, weak enforcement, increasing population, corruption and moral degeneration as the causes of ecological injustice in Uganda.

Poverty

Although the proportion of Ugandans living in poverty has reduced from 31.1 percent in 2006 to 19.7 percent in 2013 (Lubaale, 2018b) the country's current situation remains dire. Poverty trends in Uganda are explained by a number of economic, political and social variables including rising inflation, unemployment, inequality, low economic growth, conflicts, diseases, ignorance, gender imbalances, cultural, restricted education and environmental injustices. One of the officers at NFA revealed that “People cut trees for fire wood because they cannot afford other sources of energy like electricity, gas, paraffin and charcoal.” Furthermore, “some people are reclaiming swamps or cultivating into gazetted land of forests, mountains and wildlife or Overgrazing which causes soil erosion, pollution and low productivity in the long run because they do not have enough money to buy land for themselves in better places “(A male Officer at NFA in April 2021). It was also revealed that “people cut trees to make charcoal in order to earn a living because they have no jobs or other sources of income” (A female Officer at NEMA in April 2021).

It was also revealed that “animal poaching continues because people need food, for they have no money to buy from the market” (A female Officer at UWA in April 2021). This suggests that if poor people had enough money, they would not have encroached the ecosystem unreasonably. Due to severe poverty among the people in Uganda where 8.3 million are living in absolute poverty (Uganda Bureau of Statistics, 2021), the poor often get

compelled to cut trees, reclaim swamps and poach on animals for survival because they do not have enough money, hence causing ecological injustice. Todaro (2020) further attest that poverty is one of the causes of environmental degradation which lowers net benefits from the ecosystem. Therefore, poverty is one of key factors that cause the ecological injustice in Uganda.

Weak Enforcement

The government of Uganda has established various authorities including the National Fisheries Authority (NFA), the Uganda Wild Life Authority (UWA), the National Environment Management Authority (NEMA), The National Forest Authority (NFA) and Government Ministries, particularly those of Agriculture, Animal Industry and Fisheries, Energy and Mineral Development and Water and Environment, to promote and manage optimal use of resources in order to maintain a sustainable ecosystem. However, weak enforcement by these agencies is a factor that was perceived by respondents as source of ecological injustice in Uganda. This was revealed by the fact that "Agricultural encroachment, charcoal burning and harvesting for firewood consume more wooded area each year because of weak supervision and enforcement" (A Female Officer at NFA in April 2021). Furthermore, "conflict of interest among government authorities and individuals employed to enforce compliance" was evident as many of those employees own farms on government land, in wetlands and some of them run timber, charcoal and fish businesses among others" (A Female Officer at NFA in April 2021).

Findings also revealed that "there is limited institutional capacity to regulate resource utilization and enforce noncompliance disciplinary measures which calumniates into the ecosystem imbalance (A male Officer at NFA in April 2021). One of respondents revealed that "courts of law take too long to deliver judgments on matters of natural resources like land (A female Officer at UWA in April 2021).

Therefore, the Ugandan government, its agencies, authorities, ministries, and institutions such as the Police and Courts of Law, are lacking competence, credibility and commitment to promote ecological justice, resulting in current ecological imbalances.

Increasing Population

Uganda's population was estimated at 41.6 million in July 2020 (Uganda Bureau of Statistics, 2020) which is a significant increase in proportion to available resources from 34.6 million in 2014 (Uganda Bureau of Statistics, 2016). With 71 percent of Uganda's youth living in rural areas where there is low economic productivity, the country faces ecological and long-term sustainability challenges. Increasing population in Uganda has led to land fragmentation which causes low productivity (A female Officer at UWA in April 2021). "High population leads to overgrazing and cultivation in many parts of Uganda because people are more than the land, thus cannot allow some part of the land to rest" (A male Officer at NFA in April 2021). Another respondent revealed that "Growing population with limited food makes some people poach on the animals and birds in the wild life park for survival" (A female Officer at NEMA in April 2021). Furthermore, "pollution comes automatically with increasing population on the environment in terms of air, land, water, and congestion" (A male Officer at NFA in April 2021).

Therefore, increasing population in Uganda which is not matching with available resources leads to ecological injustice whereby the population starts to cut trees, reclaim swamps, poach on animals, live on the mountains, encroach the gazetted areas of forestry, wild life and agriculture among others for survival. Increasing population being harmful was noted by Malthus in Jhingan (2003) that an increase in population cannot take place without a proportionate increase of wealth. In other words, population increase becomes destructive to the ecological system.

Corruption

Corruption refers to any behavior contrary to formal duties, obligations, agreements and rules/regulations for one's private interests" (Lubaale, 2018b, p. 2). It is undeniable fact that corruption has had enormous detrimental consequences in Uganda's political, economic, and social realms. Uganda's public sector has been classified as one of the most corrupt in the world by Transparency International. Uganda was ranked 151st worst out of 176 countries in 2016, with a score of 25 on a scale of 0 (most corrupt) to 100 (cleanest) (Corruption Perception Index, 2016). Uganda was classified in the bottom 12 percentile of all nations in the World Bank's 2015 Worldwide Governance Indicators (World Bank, 2015). Corruption is a serious problem in the country, with the country losing 768.9 billion shillings ($286 million) per year as a result of it (World Bank, 2015).

People take advantage of this corruption situation to bribe NFA, NEMA, NFA and Ministry officials to reclaim swamps, cut trees, poach on wildlife and overfish, among others (A male Officer at UWA in April 2021). Police of Uganda which is a great resource in law enforcement is corrupt and therefore many people do things that are harmful to the ecology and go unpunished because the Police Officers have received bribes. A common example is bad vehicles causing pollution, which should be off the road, are seen on the roads (A male Officer at NFA in April 2021). People are given permission from lawful authorities and abuse them. For example, a person is given a license to cut 100 trees in the forest, but the person cuts 200 trees and goes unpunished. An investor is given permission to construct and establish a factory with a certain level of gas pollution but they go beyond the permitted level (A female Officer at NEMA in April 2021).

Corruption is a major problem as noted above in causing ecological injustice. From the above responses, it is clear that government officers accept brides and ordain ecological injustice activities like cutting trees, reclaiming swamps, poaching on animals for survival, living on the mountains, encroaching on the gazetted areas for agriculture and living among others as evident above go on with their knowledge which is unfortunate. As noted earlier that we need a strong sense of eco democracy, earth democracy, as well as eco justice or earth justice (Baxter, 2005; Kopnina, 2016) in order for institutions to grow strong in a democratic society, is when corruption can be reduced. Therefore corruption will continue in this weak democratic society hence perpetuating ecological injustice because regulatory authorities and the entire enforcement in the country is weak to curtail corruption

Moral Degeneration

Morality and development are intertwined. Given their close relationship, moral decadence and the separation of ethics from development is a significant blow to the promotion of ecological justice, and it is now one of the world's development concerns, Uganda being not exceptional. People care about themselves at the expense of the future of tomorrow, hence environmental degradation (A male Officer at NFA in April 2021). With increasing corruption in Uganda which is a moral failure, people harm the ecology in terms of over cutting the trees, pollution beyond acceptable measures, overfishing, bad fishing, poaching on animals, encroaching the gazetted areas for farming and habitation and going unpunished (A female Officer at NEMA in April 2021).

The increasing population which is causing ecological injustice is a result of unethical behavior of producing many children unplanned, poor parenting, hence having many dependents that are likely to encroach on the environment (A male Officer at NFA in April 2021). Human conflicts especially wars and crises led to environmental destruction, killing of wild life and spread of diseases that harm the ecological systems largely because of moral decay (A female Officer at UWA in April 2021).

As a result of falling returns from the environment, the foregoing pictures and testimony correctly suggest that moral degradation is at the heart of the current ecological injustices that are causing a political-socio-economic crisis in Uganda. This finding is related to that of (Bird 2007; Schlosberg, 2007) who established that environmental justice is primarily an issue of social justice focusing on equating connections and access to natural resources among various social groups in order to ensure adequate and sustainable use. Therefore the decline of ethics, morality, fairness, and concerns of equitable distribution as noted in Uganda automatically leads to ecological injustice because of selfishness and lack of concern for the future generations.

Research question 3: What are the development implications of ecological injustice on the development process in Uganda?

In this research question, the study presents five development implications such as low agricultural output, climate changes, fisheries, forests and wildlife/biodiversity in Uganda as a result of ecological injustice.

Low Agricultural Output

There is no dispute that agriculture is the greatest contributor to Uganda's economy which is evident with over 50 percent of total exports, 75 percent of the total labor force, and 25 percent of Gross Domestic Product (GDP). However, there is a decline because of ecological injustice. There is visible loss in soil productivity which results into income loss to farmers (A male Officer at UWA in April 2021). The growing population pressure on natural resources and general human activities

cause low agricultural output, (A female Officer at NFA in April 2021). Furthermore, increasing sunshine causes low productivity in agriculture, (A female Officer at NEMA in April 2021).

It is now clear that in Uganda, factories and farmers are losing food, income, revenue, taxes, and foreign exchange from low agricultural output because of weather changes as a result of deforestation, wetland degradation, soil erosion, poor farming methods, landslides, floods, and water, air and land pollution. There is a link between the above findings of declining productivity and a report from the Ministry of Agriculture, Animal Industry and Fisheries (2020), which shows that crop yields such as cotton, coffee, and bananas have declined in recent years from 2000 to 2020. Climate-related impacts (droughts, floods, and rainfall variability), reduced soil fertility, and poor land management are all factors contributing to low agricultural production and returns (Ministry of Agriculture, Animal Industry and Fisheries (2020). Livestock trends (2000-2020) show a rise in livestock numbers and products across all species (cattle, sheep, goats, and poultry), but productivity per unit is dropping overall, and domestic and regional demand exceeds supply (Ministry of Agriculture, Animal Industry and Fisheries, 2020).

Climate Change

Except in the semi-arid North East, the annual climate in most of the country is marked by distinct rainy and dry seasons. Uganda has a tropical environment with little temperature difference throughout the year, which can help to maintain biological equilibrium. However, the country is experiencing climate change, a worldwide phenomenon caused by human activities.

Delayed rains and the increasing difficulty in predicting rain generate challenges in planting. For example, there were no rains in January and February of 2019 and there were rains in January and February of 2020, yet farmers had not planted in 2020 basing on 2019 experience of no rains hence loses. Such unpredicted rains cause low productivity in agriculture and forestry, (A female Officer at NEMA in April 2021).

Changes in weather patterns, increased frequency of extreme weather, changes in rainfall leading to increased risk of droughts and floods and disturbing effects on ecosystem stability lead to increased likelihood of species migration and extinctions as well as increased food insecurity (A male Officer at NFA in April 2021). Increased occurrence and severity of extreme unfavorable weather events such as much sunshine/heat, floods and landslides results in low production in agriculture, fish, forestry, aquatic life and damage of infrastructure, property and people (United Nations, 2018; Nabalegwa, Asaba & Turyahabwe, 2016). Climate change related impacts (droughts, excessive rain, landslides etc.) have increased the situation of low crop productivity (Ministry of Agriculture, Animal Industry and Fisheries, 2020). This will certainly fail Uganda from achieving the Sustainable Development Goals (SDGs) 2015-2030, Uganda Vision 2040 and Poverty Eradication Programs, hence not becoming a middle-income country by 2040.

Fisheries

The fishing sector, which earned $41 million in 2004 and employed an estimated 700,000 people, has since developed considerably, earning Uganda $123 million in exports in 2017, keeping it as the economy's second-highest earner. The earnings came from 1,375 tonnes of fish and allied items, up 14% from 1,384 tonnes that brought in $8.87 million (Shs33.2 billion) in August. However, according to the Bank of Uganda, by September 2020, fish exports had fallen down to $147.75 million (Shs554 billion), from $195 million (Shs732 billion)(Bank of Uganda, 2021).

The value of fish in Uganda is falling because of decline in quality and quantity of fish (A male Officer at NFA in April 2021). The fisheries sector contributed $ 142 Million in 2005 and reduced to $ 124 million in 2008 and even volumes dropped from 39,201 tones to 24, 966 tones in the same range period because of declining quality and quantity of fish in Uganda due to ecological imbalance created by unsustainable use of the ecological system (A male Officer at NFA in April 2021).

The major fisheries sources in Uganda are the five lakes namely: Victoria, Kyoga, Albert, Edward and George as well as Kazinga channels and River Nile in which one would expect more fish of quality and quantity. However, over fishing, poor nets for fishing that bring young fish, wetland degradation, water and air pollution of the lakes, declining rains with increasing heat besides the water hyacinth have contributed to the ecosystem imbalance, hence affecting fish growth. Additionally fish statistics indicate a gradual decline in fish stocks within Uganda's lakes attributed mainly to overfishing and interference with fish breeding

grounds particularly the wetlands. The gap between the supply and demand of fish is widening each passing year (Ministry of Agriculture, Animal Industry and Fisheries, (2020). This naturally translates into low income, low taxes and low foreign exchange, hence perpetual poverty, increasing inequalities and unemployment coupled with low economic growth which culminates into low economic development of the country.

Forests

Forestry contributes significantly to Uganda's ecological and energy demands. Forestry resources provide 6% of GDP while the sector directly employs 100,000 people and indirectly employs another 750,000. Forestry helps to protect animals and other forms of biodiversity, both of which are important for the country's future heritage and for producing foreign exchange through tourism. As a result, Uganda's forests and woodlands are critical to the economy, social, and environment pillars of sustainable development. However, Uganda lost 27 percent (1,329,570 hectares in total or 88,638 hectares per year) of its original forest cover between 1990 and 2005, (A female Officer at NFA in April 2021). A respondent predicted that with too much cutting of tress, forest resources are likely to be exhausted by 2050 which implies loss of revenue, foreign exchange and decline in tourism (A male Officer at UWA in April 2021). With the continuous cutting of trees without replacement, a visible loss of wildlife and other forms of biodiversity whose survival is dependent on forests as part of the ecological system, will disappear (A male Officer at NFA in April 2021).

From the above responses, the importance of forestry is underscored which the country is taking negligently and this makes the future of Uganda blink once the quality and quantity of timber declines. This certainly implies low output in agriculture because of weather changes as result of forestry decline, loss of wildlife and other forms of biodiversity whose survival is dependent on forests as well as general tourism because of ecological injustices will amount into loss of income, revenue, foreign exchange, tourism, employment and social services provision hence perpetual underdevelopment.

Wildlife/ Biodiversity

Due to a diverse range of aquatic and terrestrial environments such as mountains, rainforests, deciduous bushlands and abundant freshwater resources, Uganda is home to a diverse range of animal and plant species. Tourism brought in $2 billion in 2017, up from $1.7 billion the previous year. Furthermore, Uganda has one of the highest levels of biological diversity in the world. Despite this, the International Monetary Fund has noted a 54 percent decline in the 2019/20 fiscal year and 52 percent in 2020/21.

The country's biodiversity is disappearing because of unreasonable human activities like deforestation, pollution and poor farming methods (A female Officer at UWA in April 2021). Bwindi Impenetrable National Park, Murchison Falls National Park, and Queen Elizabeth National Park, among others, experience an increasing pressure from the growing adjacent populations, leaving wild life in balance (A male Officer at UWA in April 2021). Therefore, wildlife/biodiversity potential is by large losing grip because of negligence and moral failure on the part of government and citizens in protecting it from unreasonable human activities that are harming the ecological system on which it survives, hence loss of income, revenue, taxes, foreign exchange and employment.

Conclusions and Recommendations

Conclusion

The nature of ecological injustice in Uganda is evident in deforestation, poaching on wild life, encroaching on reserved land, overfishing, swamps reclamation, water abuse and general human activities like settlements, industrialization, farming, pollution and socio-economic activities. The damages, extinction and exhaustion of resources in the ecosystem are real and the implications are tangible in lives of Ugandan economy and imbalance in the ecological system.

The causes of ecological injustices were established as poverty, weak enforcement of the law, corruption, increasing population and moral degeneration. It is no longer in dispute that Uganda is experiencing ecological injustices and that both the nature and causes are artificial.

Consequently, huge negative development implications exist and await the future to come in terms of environmental degradation, desertification, pollution, low agricultural output, decline in the socio- economic services, low revenue and the extinction of various species and animals in the ecosystem.

The persistence of ecological injustices in Uganda, despite large endowments in the ecosystem and regulatory authorities like NFA, NFA, NEMA, UWA and other government institutions, conveys the urgency to practice sustainable development which may enable Uganda to achieve the Sustainable Development Goals (SDGs) 2015-2030 and Uganda Vision 2040 of becoming a middle-income country in 2040 as a result of promoting ecological justice.

Recommendations

Based on the conclusions of the study, the researcher came up with the following recommendations:

1. Scholars in Agriculture, Ichthyology and Forestry should conduct research and come up with innovation of new breed of plants, animals, forests and fisheries that are resistant to destruction and desertification. This will go a long away in regeneration and building lost ecology.

2. Climatologists, meteorologists and environmentalists should innovate mitigation measures to counter react global warming, desertification and extreme weather. The outcome of the innovations will create stable climates which will lead to high agricultural output, forestry, vegetation and livelihood of all biodiversity.

3. There is a need to create public awareness of the importance of a balanced ecological system in terms of life, food, medicine, agricultural products, tourism and revenue generation. This can be done through programs of study, course units, seminars, workshops, conferences, media and community gatherings which will promote ethics, morality, justice and moral rehabilitation among students and citizens in order to reduce ecological injustice.

4. Government regulatory agencies such as the NFA, NFA, NEMA, UWA, Uganda Police, Uganda Army and the Court should work independently, yet cooperatively toward enforcement of the conservation law as stipulated in the 1995 constitution of Uganda.

5. Ministry of Energy and Mineral Development should generate more energy in Uganda using the available biomass, water resources, solar conditions, peat, geothermal, wind, oil and gas explorations. This will lead to additional revenues, jobs and alternative energy sources in the country which will aid transition to a middle-income country.

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