Chapter 8
The Need to Conserve and Protect Forest Resources: African Perspective

Sampson Abigha Inatimi

Abstract The tropical rain forests in Africa are rapidly vanishing because of constant increase in the demand for forest resources (timber and non-timber products) and forest lands for agricultural expansion and infrastructural development. These forest resources provide man with materials that aid in the satisfaction of our basic needs. It is very important to retain these benefits for future utilization in a sustainable way to meet increasing human population demands and ensure a stable eco-friendly environment, conserving, protecting, and maintaining the remaining forests biodiversity from further unsustainable exploitation. The methods of conserving these genetic resources are global concerns to nations of tropical and subtropical forests lands including Nigeria, where the rate of forests degradation is high. Nations have adopted biodiversity conventions to enhance sustainable approach in ensuring the conservation of forest resources. Some of the strategies in Nigeria include NBSAPs (National biodiversity strategies and action plans) which is aimed at encouraging the government of participating countries with an integrated template for effective biodiversity conservation approach and National REDD+ Strategy (Reducing Emissions from deforestation and forest degradation) project that will oversee the implementation and enforcement of new tactical approaches for sustainable management and conservation of the forests while augmenting carbon stock in Nigeria. Therefore, this research is aimed at identifying the need for the conservation of forest resources to nations and highlighting the effects of deforestation, the application of possible biodiversity conservation method needed for future utilization, and availability of these natural resources through effective enforcement of the biodiversity laws by the governments of participant countries from various conventions relating to biodiversity.

Keywords Plant protection · Animal conservation · Environmental sustainability · Human activities

S. A. Inatimi (✉)
Forestry Department, Bayelsa State Ministry of Environment, Yenagoa, Bayelsa State, Nigeria

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8.1 Introduction

Africa being surrounded by the oceans is known for its vast land and forest vegetations predominated by the presence of tall canopy trees that support wildlife coexistence and is home to varied biodiversity. Human dependence for food and provision of materials for our existence is largely derived from the forest resources available to us. The economy of some tropical and subtropical countries in Africa depends immensely on forest resources which include wood fuel, timber sales, medicinal herbs, edible fruits, palms especially Raffia and Elea's species, and nuts, and animal remains are useful raw materials for production processes. These products are also exported for commercial and industrial purposes, creating instant employment for the inhabitants of the area enhancing the increasing demands for these forest products. These products play significant roles in the lifestyle of the indigenous people, meeting the basic nutritional requirement of present and future generations and improving the livelihoods of the rural inhabitants as well as defining their cultural craftiness.

Forest resources are commercially useful materials that enhance the survival of humans on this planet. They are of two categories based on the valuable items obtained: timber and non-timber forest products. Timbers are woods (both hard and soft) obtained from fallen forest trees that are used as wood fuel in cooking and heating, house construction, furniture production, domestic equipment such as boats, baskets, farm tools, animal ranch fence, ply-woods, and wood-pulp for paper and textile production, etc. Non-timber forest products, on the other hand, are a diverse range of economic resources derived from the forest other than lumber; example includes food from plants such as food additives (nuts, wild fruits, herbs, spices, mushrooms, aromatic plants); plant materials (fronds, fibers, creepers, and flowers); plant derivatives (bamboo, raffia, rattan, cork, and essential oils); and animal products (honey, fur, silk, and other animal products), as highlighted by Adekola and Mbalisi (2015). Tropical and subtropical biomes receive more annual rainfall and fair temperature most likely between 20 °C and 35 °C. Thus, forests from these regions have qualities that sustain diverse range of species, which is referred to as high biodiversity. The warm, humid environment promotes the growth of a diverse range of plant species, as well as the survival of a diverse range of animals, birds, and insects.

In general, there are three types of forests in Nigeria: tropical rain forests with dense canopy tree communities in the south, mangrove swamp forests in the coastal Niger Delta, and dispersed savanna forests in the north. This forest also provides a wide range of dynamic equilibrium to our ecosystem functioning such as; a balance to respiration, pollination, and photosynthetic activities, water and nutrient cycling within the aquatic and terrestrial habitats to the atmosphere, natural air cleaner of air pollutants from oxides of nitrogen, carbon, and sulfur, while releasing oxygen and stabilizing our ecological climate change also. The tropical forests are the main target of infrastructural developments for oil exploration and exploitation, logging

concessions, or dam construction which require the expansion of the road network and the construction of roads in pristine locations (Kaimowitz and Angelsen 1998).

The management and conservation of forest resources has in recent years been threatened by the indiscriminate exploitation and mismanagement of the forest resources in Africa mainly by urbanization and developmental projects (Izah 2018; Izah et al. 2017, 2018a; Izah and Seiyaboh 2018a, b). This is partly so because forests are seriously undervalued and many of their environmental benefits are not considered by the market values.

In Nigeria, the deliberate exploitation of forests for economic or sociopolitical reasons is very common and major losses have been recorded in vegetation with forest diversity been reduced to few species. Within the last four decades, the population trends of some animals in the forests have decreased while several others are threatened, an example is the Niger Delta Red colobus monkey, *Piliocolobus epieni*, which is critically threatened by hunting and habitat loss, yet they depend, adapt, and rely on certain tree species for habitation which is cleared and cut for logs. There has been a great reduction in the population of the Red colobus monkey within the past three decades so it is declared as an endangered primate of the Niger Delta area of Nigeria. A lot of animals depend on the conditions available in the forests for their food, mates, space, light, breeding, etc.

The high rates of deforestation or vegetation loss within the tropics of Africa with dense forests resources removed daily have created serious concern on biodiversity conservation. This makes forest conservation techniques critically needed since their removal has posed threats to environmental stability and resulted in increased pollutions, soil erosion, and flooding concerns in the southern and eastern regions of the Nigeria and there are limited trees to shed off flooding and gully erosion. Therefore, regulating and adopting contemporary tree cutting measures such as clear cutting, selective cutting, and shelter wood cutting is a step to mitigate the rate of deforestation in this area.

Governments of tropical countries are concerned about the conservation of her forests and their biological resources. Therefore, they have enacted laws and policies to safeguard forests, but the implementation has not been impressive. There is a call for government agencies to enforce the Forestry Conservation and Management Acts in order to preserve the potential of our forest resources for future utilization and sustainability as well as to educate traditional institutions such as family (kinship) religions, town unions, clan and kindred, among others, to shift the trend away from traditional forest management methods with the application of technical approach and focus on the need to conserve forests resource generally in a way that will ensure greater benefit flow to everyone within the communities.

8.2 The Role of Forest in National Development

Forest resources, particularly woods, are important valuable gem for a country's economic development. The resources that come from forest cannot be thoroughly measured, but they are extremely valuable to such countries because they are regarded as their natural heritage and play an integral part of their economic earnings. Forests supply a variety of goods that are used as raw materials in different sectors. For example, forests wood is used as a source of energy for heating and cooking by rural families and the paper industries for production. These forests also provide rubber, cotton, textiles, and other raw materials for further development. Furthermore, local households earned greater forest revenue and were more reliant on forest products income than households in a distinct biotic settlement (Asfaw et al. 2013). Forest is a renewable resource whose products may be replenished or conserved if it is recognized as key contributor to the country's economic growth and to the residents whose livelihoods are shaped by what is accessible for utilization. The undervalued forests contribute to job creation, poverty reduction, industrialization, and increase in the sales of forest products. The current global foreign earnings, on the other hand, are focused on conserving, protecting, and exploiting forest resources. Fuel wood, food, medicine, forage, alcohol, industrial and culinary oil, spices, honey, gum and resin, as well as crafts like mat weaving and construction materials, all contribute significantly to forests income. Frogs, insects, snails, reptiles, mammals, birds, and fish are among the fauna species used for sustenance. Forests are home to a variety of wildlife species that are plainly beneficial to humans. As tropical forests dwindle, ecologists around the world decry the decline in wildlife populations which could occasionally lead to extinction of animal species within such forests' lands. Our forests play certain important roles to us which are described in the following.

8.2.1 Rendering Environmentally Friendly Services

Forests render environmentally friendly services such as soil stability, nutrient cycling, air and water purification, watershed protection to limit runoff, and carbon sequestration (storage) to the environment (Adekola and Mbalisi 2015). The forests help in preventing the actions of gully erosion and flooding by shedding off river water from entering into the land to result in further environmental hazards. Forests also recycle nutritional minerals made available for plants and animals, as well as the natural environment, and provide ecological stability to the ecosystem.

8.2.2 Forests are Ideal for Recreational Activities

Recreational facilities, such as game reserves, zoos, national tourism parks, sanctuaries, and biosphere reserves, not only attract tourists from all over the world, but also produce jobs for the locals and generate revenue for the maintenance of those places. Tourism encompasses a variety of activities involving people traveling to and fro, staying in locations other than their usual residence for leisure, business, entertainment, and other hospitalities required for the recreation of a new atmosphere of balance to the psychological trauma they face daily from work and other commitments while on leave. As a result, the core of recreation popularizes tourism (Ijeomah and Enaing 2018). In Nigeria, the Cross River National Park is home to the Agbokim and Kwa waterfalls, which are the state's most famous and richest forest falls. Also, the Oli camp of Kainji Lake National Park, Okomu National Park, and Yankari Wildlife Park, among others, have provided jobs for many people while also facilitating infrastructure development such as paved roads, airports, hotels, power, and railroads, as well as revenue collection (Ijeomah and Enaing 2018).

8.2.3 Increasing Nation's Gross Domestic Product

The sum of market values contributed to all producers of products and services inside a nation's borders within a given period, generally a year, is referred to as gross domestic products (GDP). The value added by industry is generally calculated at basic prices, while the overall GDP is measured at purchaser prices (Ogunbadejo and Oladipo 2017). Economic growth is necessary for sustainable development, likewise a high degree of poverty leads to poor growth and low growth leads to a high level of poverty (World Bank 2006). The United Nations Forum on Forests (UNFF) emphasized the monetary contributions of forests to global economies and it was taken into consideration. It was more than twice as much as the total output of gold and silver resources combined. Despite the lack of attention paid to agriculture, forestry, and fisheries, Nigeria's productive value added (percent of GDP) was 21.21 in 2016, with the maximum value of 48.57 in 2002 and the lowest value of 20.24 in 2014. As a result, forest and fisheries have contributed steadily to Nigeria's GDP during the last three decades (Rotowa et al. 2019). According to Sonone (2018), the forestry industry contributed 1.7 percent of India's GDP in 2002. Economic, ecological, and social functions of natural resources all have a noticeable trade income.

8.2.4 International Trade

Forest products help countries balance their foreign exchange and financial equality by bringing in a lot of money. Forest resources can be exported and used

domestically as fiber, wood, medicinal, ornamental, industrial raw materials, and energy products, among other things. As forested nations, notable nations such as India, Canada, Italy, Malaysia, and others use timber as a significant source of finance (Sonone 2018).

8.2.5 Job Creation

For many individuals living in forest areas, the forest is their primary source of income and this population of individuals runs the home-made producing industries. According to the Forest Connect Report on Nepal by Sonone (2018), one-third of Nepal's rural population collect and trade forest products, benefiting over 70,000 people. Forest resource sales are a well-known way for the government to interact with the public through economic and socio-cultural activities. Timber contractors, tree takers, saw-millers, timber lorry drivers, machine operators, log rolling crew, timber clerks, and gatherers of non-wood forest products all benefit from these socio-cultural activities (FAO 2001). Wood products are sold for construction and industrial reasons, as well as for domestic cooking and heating. Forests dwellers made available some seasonal food crops, fruits, and nuts which were carried to non-forest locations in need of it as commerce, particularly urban sites (Sonone 2018).

8.2.6 Medicine

Medicinal plants for the treatment of various types of ailments can be found in forests around the world, with some of these medicinal plants growing only in specific environments, such as *Capsicum frutescens* (Izah et al. 2019a, b), *Costus afer* (Izah et al. 2019c), *Carica papaya*, *Vernonia amygdalina*, *Ocimum gratissimum*, *Myristica fragrans*, *Anacardium occidentale*, *Cymbopogon citratus* and *Zingiber officinale* (Izah and Aseibai 2018), *Vitex grandifolia* (Epidi et al. 2016a), *Alstonia boonei* (Epidi et al. 2016b), *Cymbopogon citratus* (Kigigha et al. 2018a), *Buchholzia coriacea* (Kigigha et al., 2018b), and *Musanga cecropioides* (Kigigha et al., 2016).

8.2.7 Infrastructure Building

Wooden timbers are used in construction, furniture, wooden boats, and miniature bridges, among other things. For building dwellings and fencing farms, most villagers employ forest trees, prickly bushes, and bamboos. Some farming implements are made of wood, and the bullock cart is an ancient mode of transportation constructed primarily of wood (Sonone 2018).

8.2.8 *Food Security*

Our forests provide us with wide range of food crops to aid the poor forest dwellers' survival and the commercial sale of these seasonal non-timber products brings income to them. Some of the classes of plant resources obtained from the forest could either be edible crops or materials for further productions which include plant-based food additions (nuts, wild fruits, herbs, spices, mushrooms, fragrant plants); plant materials (fibers, creepers, and flowers); plant derivatives (bamboo, raffia, rattan, cork, and essential oils); and animal products (honey, silk), as noted by the USDA (Adekola and Mbalisi 2015).

8.2.9 *Others*

Supplying and distribution of commercial forest materials such as food, biomass, pulp and paper, rayon fibers, wooden articles, and medicinal plants locally and internationally.

8.3 Factors Leading to the Destruction of Forests

The increasing growth in population of humans and the need to satisfy our consumption rate are the biggest causes of forest destruction due to the immeasurable amounts of resources, products, and services derived from the forests to meet up with this large population. According to Rainforest Concern (2021), half of the world's rainforests have been cleared within a century; at this rate there exists an extinction threat. This calls for an urgent need for drastic action so that these forests, its fauna and flora, and human beings who depend on them will continue to survive. Loss of vegetation is considered the second major compelling cause of climate change (even more than the entire universal transport sector), responsible for 18-25% of world annual carbon dioxide emissions by an article Rainforest Concern (2021). The factors leading to the destruction of the forest are discussed in this section.

Deforestation is the intentional removal of forest and other types of vegetative cover from a location without replacement, altering the natural arrangement of trees, the flora, and wildlife within the forest (Adekola and Mbalisi 2015). It's also known as a process in which trees are felled for various reasons, but no trees are replanted to replace the ones that are destroyed (Omofonmwan and Osa-Edoh 2008; Nzeneri 2010). Most forest areas are cleared for unsustainable human uses such as agricultural crop lands and cattle ranching, logging, urbanization and industrialization activities, and dam-building for power generation and this results in great loss of forests resources. The determining factors of deforestation are shown in Figs. 8.1 and 8.2, respectively. Since 1960, the uses have had negative impact on the stability of

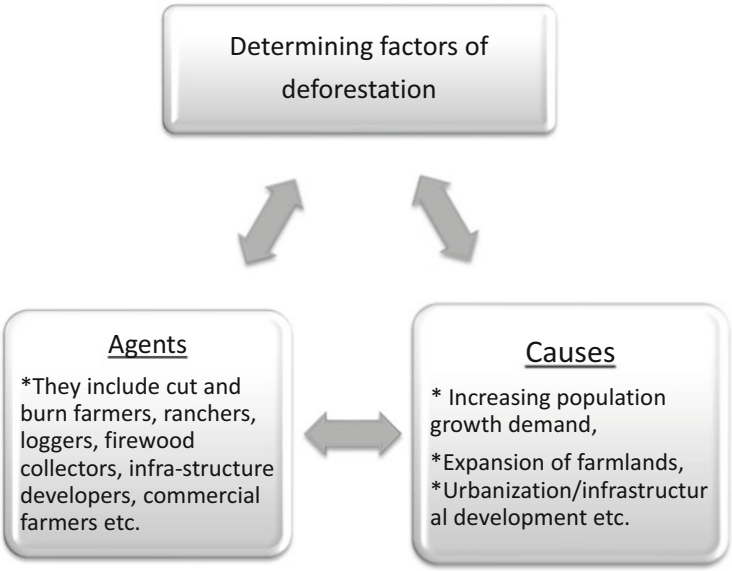

Fig. 8.1 Determining factors of deforestation

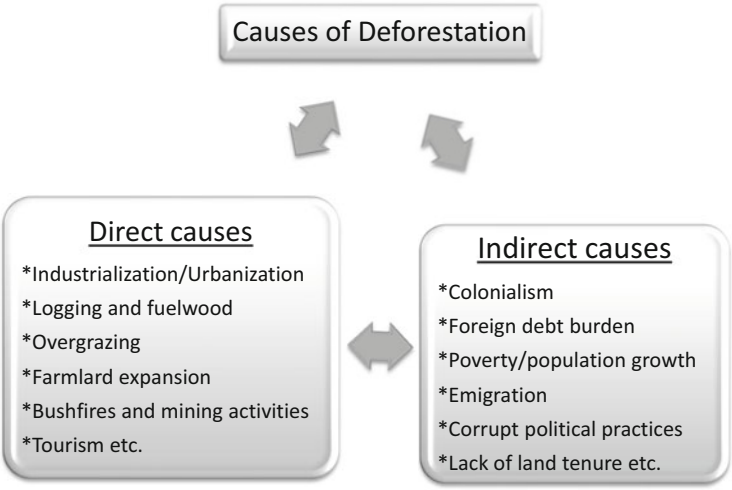

Fig. 8.2 Causes of deforestation

our natural ecosystems, biodiversity, and climate. According to an article by Youmatter, the UN's Food and Agriculture Organization estimates an annual pace of deforestation of roughly 1.3 million km^2 per decade (Youmatter 2020). According to Mongabay.com (2010), Nigeria is forested on 9.9% of its land, or over nine million hectares, with 2.38 percent (about 400 hectares) lost each year between 1990

and 2010. Between 1990 and 2010, Nigeria lost approximately 40% of its forest (about eight million hectares) in total. However, the reason why forests are destroyed will become evident if only we could distinguish between the agents of deforestation and their causes, which is crucial to comprehend the primary determining factors of forest loss (Sumit et al. 2012).

The agents of deforestation are those who are cutting down the forests, such as cut and burn farmers, ranchers, loggers, firewood collectors, infrastructure developers, commercial farmers, etc. (Fig. 8.1). The causes of deforestation are the forces or conditions that compel the agents to clear the forests which could be the increasing food demand from the population growth, leading to unsustainable agricultural expansion of farmlands, urbanization, and industrial demands, etc. These causes and agents of forests loss are interconnected and collectively attribute to the determining factors of deforestation mentioned earlier. For the sake of clarity, we can categorize the causes to be either direct or indirect cause of deforestation.

The direct and immediate causes of forest loss (Panayotou 1990; Barbier et al. 1994; Caviglia 1999) are relatively easy to identify, but the indirect causes are usually the main drivers or purpose of forest loss and the root of most discrepancies leading to destructions that are not easily calculated (Bhatnagar 1991; Mather 1991; Humphreys 2006; Sands 2005).

8.3.1 Deforestation's Direct Causes

The following are some of the direct causes of deforestation that may be seen in our environment (Fig. 8.2):

8.3.1.1 Industrialization/Urbanization/Infrastructure

Increasing population growth rates and rural-urban relocation are causing industrialization and urbanization to become inextricably connected problems. Cleared forests provide the needed land for increasing towns and cities to build infrastructure for the support of the growing population (Mather 1991; Sands 2005). Urbanization brings about an increase in human population in a particular industrialized locality and necessitates a large amount of land for infrastructural development (such as electric power stations, worship centers, health centers, houses, roads, schools, and so on) to meet the needs of the people living in the densely populated area (Adekola and Mbalisi 2015). As a result, forest vegetation in this area is destroyed to make way for these infrastructures. For smooth establishment of firms and industries, there is need for deforestation activities to build access roads, railways, bridges, airports, buildings and offices, parking lots, and other infrastructure required for these enterprises to travail. Forest resources are also explored and utilized by most enterprises as raw materials for the development of goods and services that are beneficial to them. As a result, urbanization and industrialization rely on

unsustainable exploration and exploitation activities that devastate the forest and its resources. Petroleum exploration, exploitation, and oil spills, according to Onuche (2010), are destroying vast swaths of Nigerian swamp forest. One of the main reasons of infrastructure developments for oil exploration, logging concessions, or dam construction is the tropical woods, which facilitate the extension of the road network and the construction of roads in remote areas for these woods to be readily accessible (Kaimowitz and Angelsen 1998).

8.3.1.2 Logging and Fuel Wood

Logging is the removal of trees from the forest for the goal of producing, using, and exporting timber while fuel wood is the removal of trees from the forest for the purpose of heating and cooking as energy source (Adekola and Mbalisi 2015). This method diminishes the number of tree species in the forest and damages or injures unlogged trees, causing them to die (Fig. 8.3). The tall treetops and canopies of these logged trees protect and sustain the non-timber resources in the forests and numerous plants and animals' species depend on them for coexistence. However, when destroyed for logs, it results in their mortality and subsequently leads to the endangering of some plant and animal species depending on these trees directly, thus logging activities severely degrade forests (Putz et al. 2001).

Logging provides access roads to settlers to follow on and sold logs bring income to the dwellers. Gathering of fuel woods is often concentrated in the tropical dry forests and forest areas that have been degraded already (Repetto 1988, 1990; Rowe et al. 1992; Anonymous 1994). Although fuel wood is not usually the major cause of

Fig. 8.3 Logs from cleared forests

forests' loss in the humid tropics, it could be in some populated regions with reduced forest lands. Fuel wood gathering was reported to be the main cause of vegetation loss and forest degradation in El Salvador (Repetto 1990). Fuel wood gathering can be a major cause of deforestation and degradation when the demand for it is high in the drier areas of the tropics.

8.3.1.3 Overgrazing

Our forests are being cleared to aid the rising need for agricultural farmlands expansion and grazing for more animal products, thus leading us to the term overgrazing. The grazing by livestock animals to a point where the grasslands and other vegetations in our forests are completely degraded and left bare is the result of overgrazing. These activities create room for soil erosion and other ecological disasters when water and wind action invade the degraded soil. These overgrazing activities are more common to dry areas of the tropics with reduced soil fertility and few plant species mainly of shrubs and grasses available for grazing by animals. Clear cutting and overgrazing have turned huge landmass into a desert eventually, and the grazing lands which used to be so green and rich have now become sand areas. According to Sumit et al. (2012), enormous flocks of livestock like cattle, sheep, goats, etc. strip the vegetation through grazing because of its high soil fertility. Lands could be shared by the people living within, but animals are raised for themselves as wealth generation. There is need for effective control of grazing activities by animal rangers to avoid further degradation of our forests' vegetations.

8.3.1.4 Expansion of Farmland for Agriculture

Agricultural projects begin with forest clearing activities, which is the modification of the initial vegetation. According to Ogunleye et al. (2004), this occurs in places where people rely heavily on forest lands for subsistence and shifting agriculture, which is mostly found in tropical developing countries. These cleared areas provide vast lands for subsistence farming to the world's most vulnerable people (Myers 1994). In addition to logging and other factors such as urbanization, agricultural arrangements account for about 60% of cleared forests in tropical wet forests, while fuel wood accounts for the remaining 40% (Myers 1994; Anonymous 1994). The principal sources of deforestation in Nigeria, according to Ogunleye et al. (2004) and Salau (1993), include farming activities such as shift cultivation, bush clearance, and burning. However, when the condition of the land deteriorates, people are obliged to seek out fresh forest, resulting in more deforestation (Wilkie et al. 2000; Amor 2008; Amor and Pfaff 2008). As a result, a slash and burn strategy is employed where agricultural practice becomes clearing wooded area for the purpose of cultivating crops and left to fallow by weeds to increase soil fertility.

8.3.1.5 Bushfires

In both rural and urban areas, we have seen how an uncontrolled bushfire can burn into an area of flammable plants. These flames are among the most regular natural disasters in some areas, such as Siberia, California, and Australia, where they have lately destroyed enormous hectares of forest and wildlife and are attributed to climate change being a major contributor to the size of the fires that have occurred. Fires are the most essential instrument utilized in clearing the forest for agriculture, urbanization, and other infrastructure operations, aside from the harm caused by naturally occurring wildfires in our woods. According to Sumit et al. (2012), fire is a nice servant, but it has an unlucky master in the form of forest destruction contributors. According to Anonymous (2010), forest fires affected an average of 19.8 million hectares or 1% of all forests in 118 nations, accounting for 65 percent of the world's forest area.

8.3.1.6 Mining and Oil Company Activities

The need for profitable mining for gold and diamonds, coal, aluminum, copper, and other economic minerals and metals, as well as oil corporations looking for fresh oil resources, has significant impact on rainforests. As a result of these activities, massive road networks are constructed through these pristine forests to provide miners access to dig beneath the ground for minerals and metals, as well as to construct pipelines for oil extraction. Oil companies' exploration activities require the clearing and destruction of the forests in most cases within the Niger Delta swamp for oil extraction to travail conveniently. The local dwellers within these forests are left with no other choice than to encourage themselves in relocating deep into areas as a result of the negative effects of the exploration activities, especially the noise and other chemical pollution that may spill into their habitations and they are compelled to start cutting more timbers to make new homes, sell, or to produce charcoal as occupation for their sustenance. The activities from mining and oil extractions affect the biodiversity availability and cause wildlife migrations due to the disturbances they bring to the forests and the forests are contaminated eventually with ruptured oil pipelines spouting gallons of oil into the surrounding forest, which are later washed into nearby rivers affecting aquatic organisms.

8.3.1.7 Wars and Role of the Military

The impact of military operations during wars on forest destruction was seen during Guinea, Liberia, and Sierra Leone civil war in Africa (Burgess et al. 2015) and these wars further encourage armed groups to extract important forest resources to fund their activities. However, in Nigeria, the Sambisa Forest has become a hostile hide out for insurgents and their hostages causing chaos and unrest to the forest.

Sometimes, they engaged in combat confrontation with the military soldiers destroying the forests and wildlife within. Some strategic combat activities that degrade the forests are wartime bombing, chemical spraying, building of sheltering camps or hideouts, or setting straps for enemies as such that were used by the US military in the VietnamWar (Burgess et al. 2015; Mather 1991; Sands 2005) and it is expected that forests cover might be decreased in war areas. Most military camping and training of newly recruited officers are done in the forests, with the firing of various ammunitions into forests destroying and causing disturbances to the wildlife and other organisms which could die because of this unrest. On the foreign scene recently, Myanmar government sells timber to the Thailand to fund its civil war against the Karen hill tribe and deforestation in El Salvador has been attributed to war (Sumit et al. 2012). It was documented that the military plays role in huge forest loss in Southeast Asia and South America (Mather 1991; Sands 2005).

8.3.1.8 Tourism

Having national parks, forest and game reserves, sanctuaries, etc. within certain tropical forests environment brings about local employment and infrastructural development such as good roads, airports, hotels, power, railways, and evidently revenue generation to that nation (Ijeomah and Enaing 2018), but destroys the natural forests to achieve these infrastructural aims by excessive exploitations. Perhaps, you may want to say national parks and sanctuaries protect the forests, well to a little extent, but the inappropriate opening of these areas to the public for tourism is detrimental (Sumit et al. 2012). Regrettably, most governments of tropical environment adopt tourism for making profit and sacrifice the need for conservation of these forests as recreational attractions. In addition, some companies and resorts claim to be eco-tourist establishments and are exploiting the forests for profit also and some curious tourists cause repeated injuries to the plants and animals within (Shukla 2010). Using eco-tourism as a disguise, infrastructure development is what is seen today, attracting people other than tourists also, causing massive deforestation particularly deep into the forest.

8.3.2 Indirect Causes of Deforestation

The bid to ascertain economic and infrastructural development in countries of tropical forest regions globally has led to the uncontrolled forests removal majorly by the poor socioeconomic policies made by the government of these nations and this is the reason for the World Rainforest Movement calling for actions on forests protection (Anonymous 1990). Development is the main reason while irrational deforestation has taken place in the form of direct factors (agents and causes) highlighted earlier such as indiscriminate logging, need for agricultural farmlands, urbanization, and industrialization, increase in urban–rural migrations, etc.

According to Sumit et al. (2012), our wasted forest resources are found in the industrialized nations where most of our resources end up, mainly the tropical timbers. These industrialized countries influenced us by advertising their own folkways to us which seems free and easy going and later making us to give away our culture for easily explorations and exploitations. Therefore, the indirect causes of deforestation are considered below:

8.3.2.1 Colonialism

Most underdeveloped tropical rainforest countries were colonies by European first world countries who made policies that allow them to acquire full or partial political control over them and break their indigenous powers while exploiting their available resources economically. These tropical countries have local populations who had their own traditional system of land management in these areas years before the advent of explorers from rich industrialized countries. In this process, previously self-sustaining local economy of the people was turned into export sites for commercial exploitation of indigenous genetic resources for international production (Sumit et al. 2012). The colonial migrants encourage wood cutting from our natural forest reserves for the development of cocoa and palm oil plantations of which the logs were exported out of West Africa and until now, this process continues in different forms of influences and colonists encourage the incessant exploitation (Colchester and Lohmann 1993). These wealthy countries with colonial powers have deficit of their own natural resources and rely on the resources of the financially poorer countries. Now you can see why colonialism is a driver of deforestation because of the political influence it had on their colonized countries.

8.3.2.2 Heavy International Debt

Most Third World countries are poorer countries with rich natural forests resources and yet already undergoing heavy foreign debt burden all in bid to meet up with the global development agenda of sustainability, and now with the recent fluctuations in the interest rates, call for urgent way of repaying these enormous debts. Obviously, they are compelled to exploit forests resources and other minerals available to them as foreign exchange services for their rising debts (Sumit et al. 2012). Most rich nations assist poorer countries to attain visible infrastructural development (such as building or supplying materials for the construction of electric power stations, bridges, railways, airports, tarred roads, health centers, houses, schools, and so on) and in return pay with the exploitation of their rich natural resources for a period to cover for this indebtedness. However, the inconsistent decision enforcements from these poor, tropical countries are also attributed to issues with corruption in government, the military, and struggle for economic powers which encourage more debt burdens to them.

8.3.2.3 Poverty and Population Growth

The increased rate of exploration and exploitation of forest resources (timber and non-timber forest products) is necessary to meet the demands of a growing human population and the high poverty rate within forested settlements. The people's needs are satisfied via exploitation of forest resources to improve their survival and meet their demands. As a result of the constant strain placed on the forest and its resources, overexploitation occurs. Fuel wood and other forms of wood for construction reasons are in high demand, putting a lot of strain on the forest (Salau 1993). The indigenous people use fuel wood for cooking and heating rather than petroleum products as their energy source (Onuche 2010). According to the FAO and other international organizations, poverty and overpopulation are the main causes of deforestation (Sumit et al. 2012). These organizations often feel that fostering development while attempting to decrease population growth mitigates these difficulties. However, the people desire more food and space for the need of additional lands for unsustainable agriculture and housing which leads to the loss of more forests. According to Purnamasari (2010), most people do not have the financial resources to spend in improving soil quality and increasing yields on existing cleared property. Usually, majority of the farmlands are owned by powerful influential persons which displaces unfortunate farmers into rainforest areas to clear and make new farm settlements. As far as these influential persons take hold of power, it will remain difficult to achieve lasting land reform and deforestation continues (Colchester and Lohmann 1993). However, sustainability can be promoted if the government of these tropical countries would devise a sustainable management system for individual's life support and controlling population growth as a positive step towards curbing the link between poverty and overpopulation role in our deforestation.

8.3.2.4 Emigration

One of the noticeable indirect causes of deforestation is the allowance of foreign nationals who leave their resident country perhaps with the intent to settle elsewhere or explore the land and subsequently colonize the forest (Mather 1991; Colchester and Lohmann 1993; Sands 2005). The government and people thought that by encouraging emigrants and their colonization programs into rainforest areas could lessen poverty from these financially poor countries with rich natural forest resources. Well, these programs sadly failed and caused harm to the indigenous people and the forests environment. According to Levang (2002), landless migrants raise population pressure and demand for food and other valuable forest resources, causing local farmers to enhance production by cutting deep into the forests to extend cropland or habitations. Foreign migrants, on the other hand, may be unconcerned about forest conservation in their new communities, leading to more deforestation.

8.3.2.5 Traditional Land Tenure is Absent

In most tropical countries, the government has complete control over forests and is somewhat lax in efficiently regulating their use, especially when they have a loosely defined tenure system; it is usually detrimental to the locals and the forests (Chomitz et al. 2007). Majority of forest residents and landowners lack evidence of ownership or property rights to hold on and are displaced by others; the powerful influential few would acquire tenure over their properties (Mather 1991; Deacon 1999; Sands 2005). This implies that they would have to relocate their settlements and cut deep into the forest for food, space, and shelter, resulting in further depletion of forest resources.

8.3.2.6 Undervaluation of the Forests

The forests have provided us with valuable resources for economic sustainability and meeting the increasing human population needs. However, it is given less economic value, probably because the economic value most times is seen on a very small extent of benefits on the terms of raw materials and products which are traded in formal markets and available for human consumption and production (Emerton 2003). However, these direct uses only represent a small fraction of the total value of the forests overlooking the excess benefits far above the physically marketed products. Mather (1991) and Sands (2005) identify forests to gain value only when cleared for obtaining official improvement title. When non-wood products are extracted from the forests, it is also suggested to add value to the forest but not economical when measured up to clearing alternatives. Therefore, clearing of forests for logs, fuel wood, and further wood allied productions is encouraged and paying less attention to the environmental benefits the people derive from the non-wood forest products too. If only government would see these unquantifiable economic benefits and place high value to every product from the forest, then it will be protected and preserved from indiscriminate degradation.

8.3.2.7 Corrupt and Political Practice

Corruption is one of the noticeable main causes of deforestation as identified by FAO in its 2001 report, which advised that urgent concern needs to be given to these illegal forest practices and corruption in many tropical countries. These illegal forest practices were highlighted by Contreras-Hermosilla (2000, 2001) to include: forest products being smuggled across borders, permitting illegal logging and selling of harvesting permits, forestry officers give approval to illegal private contractors or enterprises, harvesting of high economic valued trees (protected trees) by commercial dealers and unlicensed processing of forest raw materials, and so on. All these corrupt political practices are common within the tropical and subtropical nations

with rich forest environment. If corruption and illegal practices are allowed to continue, then indiscriminate deforestation is the result and biodiversity is endangered.

8.4 Effects of Forest Destruction

The destruction of the tropical forest causes enormous natural consequences for our ecosystem and poses significant threats to global stability while playing an important role in the national development of most countries' economy. The effects of deforestation could either be beneficial or harmful depending on how sustainably it is utilized. Forests loss has the following primary effects on us, according to Onuche (2010), Omofonmwan and Osa-Edoh (2008), and Salau (1993).

8.4.1 Biodiversity Threat

There is a serious threat to biodiversity and wildlife as deforestation continues, affecting the complex mixing of distinct species of plants, animals, and microorganisms, as well as their genetic constitutions, habitats, and ecological niches which is referred to as biodiversity. The beauty of this world is based on its biodiversity, which can be seen everywhere, a drop in wildlife and biodiversity because of deforestation will result in the loss of many forest products that support a large proportion of dependents. The destruction of vegetations can be a threat to living organisms because there will be instability in our ecosystem, especially the oxygen – carbon (IV) oxide balance within the components of the ecosystem and this could result in global crises. The complexity of this world shows how interconnected and interdependent we are to different organisms for survival; tall canopy trees provide shades to support animals and smaller trees which may not survive heat intensity of the sun directly. In addition, trees also provide animals with food (fruits, nuts, leaves, etc.) and shelters they need to adapt and survive on.

8.4.2 Depletion of Soil Fertility

Loss of soil fertility occurs when the components which sustain the fertility of the soil are removed and not replaced or maintained leading to poor crop yields and scarcity of food results in hunger and death to dependent organisms. The removal of the forests is a major cause of soil infertility because needed nutrients are not replaced and this foster other destructive ecological agent like floods, gully erosions, and even drought in some cases causing degradations. When the nutrient-rich

organic topsoil is eroded or depleted of its original organic contents, this will eventually damage the soil structure and texture embedded in it.

8.4.3 Lead to Soil Erosion

The degradation of the upper layer of the soil by agents, runoff water, and wind action is possible when the trees meant to shield off these effects are removed for infrastructural purposes. The forest acts as a network between the soil and the atmosphere by increasing the permeability of the soil to rainwater which reduces runoff and binding the roots of plants to the soil firmly to control wind action. So, the removal of vegetation overtime would increase the rate of surface erosion and eventually degraded the soil leading to destruction of crops, soil, and animals and affect human farmlands and other properties (Sumit et al. 2012). Thus, forest and vegetation help to reduce this adverse destruction by water and wind erosion by forming a firmer anchorage to the soil.

8.4.4 Pollution

The extraction, collection, and distribution of forest products within the forests and on our municipal environments litter series of wastes remains which could be washed into water bodies to cause blockage of water flow within the river system. The process of transporting wood materials to processing industrial mills for furniture and construction works also litters unfriendly solid wastes to our environment. In some cases, hazardous chemicals are likely used to separate the waste from economic minerals mixed. Often these hazardous chemical separation techniques are done within the forest site where these minerals are extracted and eventually washed into rivers, disturbing the river's ecosystem. The production of hazardous chemicals and its use in the forests imposes major threat to biodiversity globally. According to Imarhiagbe and Egboduku (2019), the major perpetrator of environmental pollution has been human beings itself; our exploration, extraction, and exploitation activities such as site clearing, emissions from refineries through flared gases, industrial processes, burning of liquid and solid waste, releasing wastes of solids (plastics), liquids (oil spills, pesticides), and inorganic fertilizers into the air, soil, and water. These non-easily degradable chemicals accumulate into the toxic level of the food chain of faunas and flora within. In return, affecting the survival and adaptation of species by this disruption results in ecosystem instability and eventually causes species extinctions and loss of biodiversity (Egboduku and Olorunfemi 2016). Hence, understanding humans' negative roles toward pollution of our environment within the forests area and how to mitigate it is of crucial importance for setting priorities for the current ecological challenges we see today.

8.4.5 Loss of Local Medicinal Plants

Any plant which protects health or prevents certain illnesses or possesses curative characteristics is referred to as a medicinal plant. Majority of the poor people living in rural and urban settlements of the tropics use medicinal plants as their only available treatments for minor and severe ailments (Elisabetsky and Wannamaacher 1993). Most traditional medicines' use in the treatment of injuries and other illnesses depends largely on the herbs or parts of plants like their leaves, flowers, roots, fruits, peels, inner and outer barks of stems and exudates, etc. that are taken from the forests and useful for the treatment of illnesses like worms, urinary infections, coughs, burns, cuts, sprains, fatigue, etc. This medicinal importance is demanded by phyto-medical and pharmaceutical industries for commercial productions leading to the collection and harvesting of these plants for sale. There have been reports in Africa that the overharvesting and destruction of specific selected species of medicinal plants is because of the collection for export and increased urbanization demands leaving local inhabitants without medicinal remedies (Cunningham 1993).

8.4.6 Apparent Reduction of Foreign Earnings from Timber Export

The importance of timber products to a nation's economy is enormous and placed topmost priority in the country's exchange market. Most tropical countries' GDP depends largely on the earnings from timber exports to other nations in need of it and is used to support the economy and foster infrastructural development in that nation. However, there have been foreign income decline from exporting timber products recently; this might be attributed to the overexploitation of timber products in our forests and lack of conservation schemes (reforestation or afforestation) after tree felling, leading to the vanishing of selected timber trees of high-quality demand in the forests.

8.4.7 Contribution to Climate Change and Global Warming

A common contributor to climate change is deforestation and the others being the combustion of fossil fuels and decomposition of organic matters which emit atmospheric carbon (IV) oxide. The removal of world's forests is responsible for about 11% of global greenhouse gas emission. Forest is one of the two natural reservoirs of carbon, the other being the ocean. This forests' removal comes in the form of wildfire, logging for wood, clear cutting, and livestock ranching for agriculture, among others. The increase in concentration of greenhouse gases results in climate change (Salau 1993). Some of the visible impacts of climate change include extreme

weather conditions, drought, pest infestation, rise in sea level and storms, time changes of seasonal events, collapse of glaciers, wildfires, land degradation and pollution, and global warming. This subsequent rise of temperature will strongly affect natural biological systems, and migratory species of organisms move towards Polar region. Deforestation contributes to the warming of the earth when trees are destroyed, burnt, and allowed to decay and the stored carbon is released into the air as carbon (IV) oxide to cause a greenhouse effect resulting to global warming of the earth crust.

8.4.8 Leads to Desertification

Vegetation plays a vital role in the composition of the soil and its fertility which determines the biodiversity and wildlife within the land. However, the continuous use of land for agriculture, overgrazing, and deforestation rapidly degrade the nutrients of the forests' soil leading to gradual desertification. Lands void of biodiversity sustainability eventually affect economic activities to travail such area.

8.4.9 Forests Loss Could Lead to Flooding

The importance of vegetations in reducing floods has been well-known over time in the coastal areas. When a river cannot handle the water rise and there are no forest trees to watershed it off or tree roots to absorb water from the soil, it results into flood events in lowlands and coastal areas, leading to loss of life, properties, plants, and animals.

8.5 Options for Conserving Forest Resources

It is necessary to protect and preserve the forest and its resources from further destruction and indiscriminate exploitation to attain infrastructural developments with no consideration of the effects it will cause to our ecosystem's stability. Therefore, the conservation of the natural rainforest would ensure the continuity and availability of the benefits derived from them, such as the provision of food and habitation for wildlife, provision of raw materials for construction and industrial uses, watersheds from trees to control flood and erosion, stabilization of soil's fertility, and reduction of effects of climate change (Bassey 2003). These benefits are so significant to man that they ensure that our survival and adaptation on earth is made possible. The effort to preserve the world's rainforests and other forests keeps on growing global concern about how this issue can be managed. The good part is that it is a renewable natural resource and conservation is the best tool in use with the

capacity to renew the forest resources. The decline of forested area in Nigeria has resulted in a general concern for nationwide conservation.

The reasons for conserving our forest were highlighted by World Wildlife Fund (1980) and summarized as follows:

- To sustain life support and maintain the necessary ecological processes.
- To maintain biodiversity and wildlife.
- To guarantee a sustainable management of species and ecosystems.

In other words, to achieve these reasons, every individual, country, and region must contribute to stop deforestation with the following approaches being taken:

8.5.1 Community Enlightenment

Educating the people and tourists is necessary about the need to develop or protect the forests and be part of educative schemes and activities for forest conservation and stability of our ecosystem. Educative programmes and skills are necessary so that the rural dwellers can be enlightened on the environment and its related problems caused by our activities. Environment education is the ability to acquire a conscious knowledge and awareness of a vase range of environmental context. These programmes can be used to build up the rural people and educate them on how to read and write issues concerning their surrounding environment, and thus, understand the nature and components of their forests and procedures they can utilize to protect and preserve their forests. Community enlightenment schemes will take away the ignorance from the public and policy makers on forests conservation, its aims, and methods through forestry extension aids.

8.5.2 Enforcement of Forest Laws and Policies

For deforestation to decrease, it is essential for the government of tropical countries to have a strong and stable enforcement system to curb the existing practices. The government should ensure they enforce the laws and policies they create to guarantee the protection and restoration of forests. The policy and regulatory procedures for forests have already been made to protect forests but enforcement is the problem. This calls for modification and amendment of these laws such that it will persuade the public's participation in forestry conservation and management and protect the people's traditional rights and tenure (Sumit et al. 2012). Therefore, in order to stop further deforestation and overexploitation of the forest resources, these actions are necessary; negotiation between the government and stakeholders of the settlements within the forests, warnings regarding forest laws, reserves and protected areas should be made known to everyone, violation notice be issued to offenders of these laws, arrests be made to violators if they neglect warnings, fines and

environmental court actions be carried on for various offenses indiscriminately violating the stakeholders of the forests. FAO (2010) said that half of the deforestation globally in the tropical countries could have been stopped if their governments were determined to do so.

8.5.3 Reforestation and Afforestation

Indeed, the deforested areas need to be reforested and the deliberate growing of trees as replacement for the felled ones should be enforced by policy makers and dealers of forests materials. This will increase the area of forest vegetations and use of deforested lands or used marginal lands (such as railway tracts, along roadside, on contours, avenues, boundaries, etc.) or degraded lands (not suitable for agricultural production) for replanting will have a profitable sustainability (Sumit et al. 2012). Trees planted outside forest areas will decrease pressure on forests demand for fuel woods and timbers. Although efforts to replant deforested lands take place annually, in most cases, replanting is done with the aim of hastily growing trees to be cut down by the logging industry soonest. While in some other countries, replanting is done by replacing the deforested areas with some economic valued trees such as raffia palm, bush mango, moringa tree, rubber tree, etc. to enhance local economy.

8.5.4 Management of Protected Areas and Reserves

It is fundamental to conserve forests and its biodiversity by managing some protected areas or reserves (Myers 1994). Portions of land restricted by government and banned from commercial activities for the purpose of afforestation and preserving biodiversity from exploitation and extinction are referred to as forest reserves (Imarhiagbe and Egboduku 2019). However, in Nigerian forest reserves, there exists a great threat as a result of lack of consistent management and monitoring of these protected areas by policy makers, and also, increasing population and economic activities have also contributed to encroachments.

8.5.5 Decrease in Population Growth

It is evident that the increasing growth in human population is a major driver of deforestation which results in other factors like unsustainable expansion of agriculture farmland into the forests, urbanization, and industrialization to meet up with the sustainability and economic development of these tropical nations. The uncontrolled increase in the growth rate of people living within a country brings poverty to that nation and loss of income meant for development used for sustaining them. These

make the inhabitants living within the forests to mount pressure on them as folkways available for exploit and habitations. However, the benefits of reduced population will be an increase in our rich forest resources for sustainability because of the decrease on our total dependents on the forest products and subsequent increase of our foreign capita earnings as a country when the genetic resources are effectively managed for commercialization and infrastructural developments and foster biological diversity conservation and availability for future utilization by the people.

8.5.6 Use of Less Wood Products

We should encourage the use of substituted materials for wood works more often. If only we can stop using timber for most constructions, then the market for wood product demands will gradually reduce the alarming rate of deforestation. However, many countries are discussing on how to encourage environmentally friendly timbers' substitute for infrastructural development and construction.

8.5.7 Adequate Monitoring and Information System

Adequate monitoring and information system should improve globally for effective biodiversity conservation, distribution, and utilization of biological resources. There should be adequate information about the nature of our forests, where they are located, and the components of the forests. We can correctly manage a forest ecosystem with the understanding of remote sensing technologies, making it possible and logical to identify flash points of deforestation. Monitoring efforts can be done by international communities organizing the necessary monitoring schemes on the locations, causes, and extent of global deforestation, and making interventions which were possible to conserve the biodiversity in our forests.

8.6 Role of Biodiversity Law on the Conservation of Forest Resources

Biological diversity is the difference among living organisms of the same species and that of the species of other organisms within the ecosystem. It is the collection of different varieties among species of plants, animals, and microorganisms in the various ecosystems which they are part of. The inhabitants of forest lands benefit from the huge diversity of biological resources within their domain through basic ecosystem interactions, goods and services provided such as food, fiber, medicine, climate regulation, erosion and flood control, nutrient cycling, air, and water

purification, etc. Some people depend directly on the usable land, water, plants, and animals available to support their families and others dwell on the commercial needs from the forest resources by collecting and distributing them to places of demands as means of sustenance.

Biological diversity can be categorized into genetic diversity, species diversity, and ecosystem diversity which are mutually dependent of each other. The observable difference within species of a particular population of organism is enhanced by the variation in the inherited traits of living things and the ecological factors present that make them function within that geographical area. Therefore, the variety of species population of organisms in an area changes when the genetic make-up of that organisms changes with corresponding difference on the various ecosystems (terrestrials, arboreal, marine, freshwater, estuarine, marshes, swamps, arid, etc.) in which they survive and adapt to the physical factors present for habitations.

The legal framework, instruments, and mechanisms regulating the achievement of certain biodiversity's conservation aims and objectives in our society is called "Biodiversity law". This Biodiversity law could include legislation, Acts, Decrees, and customary by-laws for national, regional, and international laws. Biodiversity law cannot stand alone, but is an integration of the international laws on issues concerning the conditions for biological diversity conservation, management, and sustainable use of its components, usually made and adopted by participating countries during the Biodiversity Conventions held to provide rules and established mechanisms for the line of actions on biodiversity and ecosystem, and also set up a structure that supports countries' effort to achieve this goals. According to International Development Law Organization (2016), this framework provides countries with the basis for governmental policies and actions in the establishment and safeguarding of the environment and its genetic resources, likewise the effective sharing of benefits rising out from the utilization of biological resources in a fair and equitable approach. This law also acts as a tool to create incentives, empower and recognize the rights and responsibilities of the people at all levels and to act for biodiversity. The biodiversity law is no different from the forestry laws and the environmental conservation laws of a nation where it hails from because diversity is within the forests of our environment.

However, in June 1992, Nigeria joined 153 countries at the United Nations Earth Summit to sign the Convention on Biological Diversity. The Convention calls for adoption international agreement on biodiversity conservation and articulate planning strategies and foster partnership between countries and among government organizations, nongovernmental organizations, and private sectors. The five key objectives of the Convention are:

- Biodiversity conservation at every level of the ecosystem;
- Biodiversity must be sustainable to maintain the continuity life support systems.
- Biodiversity benefits should be fairly and equitably shared to support conservation and sustainable development.
- Significant technological advancement for sustainable development should be shared; and

- Biodiversity conservation should have an established universal financial mechanism.

From Article 6 of the Convention on Biological Diversity National Biodiversity Strategy and Action Plans (NBSAPs) are adopted as the main tools for translating the procedures set out in the Convention on Biological Diversity line of actions and pathway in achieving these objectives within a nation. As said in the Convention on the Conservation of Migratory Species of Wild Animals (2015), this NBSAPS is an integrated instrument for countries to plan the biodiversity conservation, use of its components in a sustainable manner, and the effective sharing of the benefits gotten out of the utilization of biological resources and concentrating on the threats of biodiversity resources. It is also intended for NBSAPs to prioritize and identify national targets and the various actions required to meet up these targets to achieve this common national biodiversity and ecosystem objectives.

United Nations Environment Programme (2018) highlighted some biodiversity laws and principles used by National Biodiversity Strategies and Action Plans as tool for conservation and protection of biological diversity and the environment which are summarized in Table 8.1.

These principles are applicable to the support of biodiversity conservation laws and protection of our forests, yet can only be effective if nations enforce it. Often, forest conservation policies are frequently implemented poorly because of inadequate legal support by the government of participating countries and the noninvolvement of forest dealers' institution stakeholders and wood-based industries, who are the key players of the commerce of the forests industry. Thus, leading to the inability of the forest conservation, protection, and regeneration schemes to work effectively affects the biodiversity and wildlife conservation goals, especially when no replacement with economic tree planting exercise is carried out due to lack of legal backing by government and the wood-based firms not willing to do it on their own also (Bassey 2003). The biodiversity law is the integral legal instrument that can help policymakers and other stakeholders of biodiversity examine the effectiveness of their nation's biodiversity processes with the aim of developing and enforcing legal knowledge and practical line of action on biodiversity conservation policies in forests areas. These will help institute a lawsuit against any violator of laws on forest conservation, maintenance, and protection.

8.7 Role of International, National, and Local Agencies in the Conservation of Biodiversity

There have been various approaches used for the conservation of biodiversity by most tropical countries' agencies contributing to the stability of the ecosystem and mitigating climate change globally while fostering economic development. These agencies (regional, international, national, or local) are saddled with the responsibilities of providing an exceptional approach for effective forest governance and

Table 8.1 Biodiversity laws and applicable environmental principles

Biodiversity laws	Principle applicable
Those held accountable for activities that cause or may likely cause damage to biodiversity should bear the cost of pollution.	The polluter pays principle
Parties and stakeholders should promote suitable demographic policies and eliminate or reduce unsustainable models of production and consumption.	The sustainable use principle
We should avoid or prevent adverse effects on biodiversity at all costs.	The safeguarding of biodiversity principle
The needs of the present and future generations will be met if all activities shall take biodiversity into account.	The sustainable development principle
Biodiversity precautions should be taken by parties and stakeholders for effective protection and conservation;	The principle to take precautionary action
Uncertain scientific approach should not be used to defer cost-effective measures to prevent biodiversity degradation, especially in situations where there are risks of serious or irreversible damage;	
We should take the various needs of stakeholders having an interest in biodiversity into consideration.	
Biodiversity conservation requires the essential participation of women.	The principle of nondiscrimination
We should take the courage of the youth and the ideals, creativity, and knowledge of indigenous people into consideration;	
Consideration should be given to all relevant stakeholders and to the identity, culture, and interests of indigenous people.	
We should avoid or prevent adverse effects on biodiversity at all costs.	The non-degradation principle
Stakeholders and institutions should guarantee that any actions they fund, authorize, or perform do not degrade biodiversity.	
There should be effective participation of all concerned citizens as the best way to handle biodiversity issues.	The public participation and access to information and justice principle
Biodiversity information will be widely available to all if nations facilitate and encourage public awareness and participation.	
Biodiversity conservation, protection, and restoration need the cooperation of nations	The principle of common but differentiated responsibilities
Developed nations should accept the responsibility that they bear in the conservation and sustainable use of biodiversity, taking into consideration the demands which their societies, technologies, and financial resources place on biodiversity.	
The conservation of biodiversity shall form an integral part of the development process and should not be considered in isolation from it;	The integration principle
Biodiversity conservation laws and policies should be incorporated into other related policies.	

(continued)

Table 8.1 (continued)

Biodiversity laws	Principle applicable
The significant impact on biodiversity shall be evaluated, assessed, halted, reversed, and minimized in advance and in a timely manner.	Preventive principle
The causes of biodiversity loss or degradation shall be projected, identified, prevented, and attacked at the source.	The Source principle

conservation of biodiversity through influencing policies, planning, budgeting, and taking joint actions to promote sustainable land use in an environmentally convenient way.

The United Nations Environment Programme on Law and NBSAPs was to promote environmentally sound practices worldwide and meet up with the objectives made during the various Biodiversity Conventions held, and adopted by participating countries, to save the world's forest resources.

Recently, the Government of Nigeria has joined in the fight to curb deforestation activities and reduce forest emissions that contribute largely to the global climate change with the launching of a National REDD+ Strategy (Reducing Emissions from deforestation and forest degradation) project that will oversee the implementation and enforcement of new tactical approaches for sustainable management and conservation of the forests while augmenting carbon stock. The demand for hundreds of thousand hectares of cleared forestlands annually across countries is for the purpose of meeting the economic developments, but there is no sustainable management plan for the ecosystem's stability. Therefore, the Government of Nigeria has given key priority to the recent happenings launching National REDD+ Strategy project to combat deforestation and other forest-related emissions in the country with the support from the World Bank's Forest Carbon Partnership Facility (FCPF). This strategy involves stakeholders' participation (inclusively the related government parastatals, forest reliant community, civil society group, and private sector) to provide needed tactical framework to mitigate deforestation and emissions in Nigeria. National REDD+ Strategy programme is not just aimed at tackling forest degradation and deforestation problems only, but also promoting conservation through afforestation (tree planting) and rehabilitation of lands degraded, creating a supporting network for sustainable management of the forest resources and developmental trajectory for low forest emissions, as well as monitoring and reporting the progress in reaching the objective of having an eco-friendly society for the citizens of the country.

8.8 Conclusion

The importance of conserving, preserving, and protecting biodiversity and wildlife in our forests from indiscriminate exploitation and destruction could be sustained if the government and other policymakers can collaborate with stakeholders of the forests to identify, proffer, and enforce policies for forests' resource protection to avoid the extinction of threatened species and ensure biodiversity availability, sustainability, and effective utilization. Therefore, there should be frequent urban-rural awareness and enlightening schemes, like the REDD+ strategic activities which will enable indigenous forest dwellers have a sense of ownership to protect their forests' biodiversity and cooperate with ecotourism initiatives for the well-being of the country. With recent happenings in climate change, urgent actions are required to protect and conserve our local forests for future utilization and ecosystem stability. So there should be legal actions against any violator of biodiversity laws or forest laws on forest conservation and protection. Also, eco-management activities such as regenerating already utilized resources or planting specific economic valued trees (basically food trees) as replacement for felled trees, positioning of forest guards in reserves or protected forests areas, and identifying alternative resources for use in construction processes rather than total dependence on timber products. These will surely help in reducing deforestation and dependence on forest resources in our society.

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