Original Research Article

Conservation and Restoration of Endangered Plant Species in the Tropical Forests

ABSTRACT

Indiscriminate charcoal productions, timber harvesting, demand for farmlands and overgrazing have aggravated land degradation process in the tropical regions. At each point of this cycle, species are lost and biodiversity is obtainable only in the National Parks, Game reserves, Forest reserves, Wildlife sanctuaries. Forests and its resources are important assets that the tropical regions can sustainably manage for its renewable potentials, environmental benefits and socio-economic importance to mankind. Thus, this paper aim at reviewing of past research works to provide profound solutions for conservation and restoration of forests and its products in the mid of financial shortcoming among the developing nations in the tropical regions. Based on this review, endangered plant species such as *Prosopis africana, Parkia biglobosa, Khaya senegalensis, Gleditsia assamica, Gymnocladus assamicus, Aquilaria malaccensis* and others can be restored; and genetic heredity (with qualitative characteristics) can be sustain for generational use if only we will all ignore the voice that "demands high financial resources for the management of endangered species before it can be conserved and restored". Even without the provision of financial resources for conservation and restoration of endangered species, with high interest and euphoria among the youths, the young populace can conserved and restored the tropical forests and its biodiversity in the regions. This can be achieved by frequent inclusion of youths in decisions making and the use of non-formal education methods such as drama, playlet, music concerts among others. Therefore, it is recommended that communities around forest reserves in the tropical regions should be economically empowered, so that they can have alternative sources of livelihood that are biodiversity friendly, thus, reducing their dependence on forests and forest products.

Keywords: ??

INTRODUCTION

Tropical forests are forested landscapes in tropical regions; *i.e.* land areas approximately bounded by the tropic of cancer and Capricorn, but affected by other factors such as prevailing winds. Tropical forests occur in all three main tropical landmasses, America, Africa and Asia Pacific (Encyclopedia of Life Sciences, 2002). Differences in the geological history, climate, topography, and extent of these three areas have resulted in characteristic differences in biota. By far the largest area of tropical forest occurs in the American or neo-tropical region, which contain approximately half ($4x10^6 km^2$) of the world's total. Central and West Africa contains approximately $1.8x10^6 km^2$ of tropical forest, extending from the Congo basin westward to the Atlantic Ocean. Also, smaller areas of tropical forest occur in Australia, Madagascar, East Africa, Hawaii and the islands of the South Pacific (Encyclopedia of Life Sciences, 2002).

THE PROBLEM

Tropical forests are under great anthropogenic pressures and require urgent management intervention to conserve the biodiversity for productivity and sustainability. Habitat destruction, forest fragmentation, and the adverse physical and biological consequences of edge and buffer effects are some of the effect of tropical deforestation. The biological diversity of tropical forests has been poorly documented, while the available data is grossly inadequate. Most species (plants, terrestrial and aquatic invertebrate, small mammals, reptiles, amphibians) in the tropical forests remain undocumented (Boboye and Jimoh, 2016). There are more tropical species (organisms) to be identified; though identifying new species would not provide much help concerning species diversity, ecology and behavior that might contribute to their chances of survival. But the much help that is enormous importance are:

i. how can we willingly conserve tropical diversity without expectation of reward for the conservation?
ii. How can we take the task of conservation and restoration of endangered species as a task for all and not for categories of people (Ecologists and Foresters) only?
iii. How can tropical forests be conserve with little or no dependence on monetary?

TREND OF TROPICAL FORESTS

Globally, 52% of the total forests are in tropical regions and they are known to be the most important areas in terms of biodiversity (Kacholi, 2014). Tropical forests occupy center stage in term of biological diversity, it housing at least two-thirds of the world's biodiversity; despite covering less than 10% of Earth's land surface (Bradshaw *et al., 2009*).

The negative environmental impacts of forest loss is most evident in the tropics, where the majority of future deforestation is anticipated (Laurance *et al.*, 2014, Annunzio *et al.*, 2015), and which hosts critical ecosystem services including biodiversity and carbon storage (Gibson *et al.*, 2011, Asner *et al*., 2010).

The rapid increase in human population near forest ecosystems has increased threats of degradation and fragmentation to these ecosystems (FAO, 2010). As forest estates in most African countries continue to disappear due to varying land use pressures; large numbers of economic and medicinal tree species are gradually going into extinction**.** The diversity of tree species is decreasing (due to the rate of habitat destruction and over-exploitation) which are far greater than the rate of genetic diversity collection and conservation (National Centre for Genetic Resources and Biotechnology, 2008).

It is clear that most tropical forests will be destroyed or degraded within the next few years if urgent steps are not taken; because of the size of the human population in the tropics and subtropics, extensive poverty and our collective ignorance of effective ways to manage tropical ecosystems so that they will be productive on a sustainable basis. Over the next few years, the confrontation between human needs and forest preservation will become higher. The protection of forest or game reserves against threat and extinction can be achieve, if there is a genuine willingness to take the task by all people that benefit directly or indirectly from forests and forest resources

There is urgent need for all individual to join hands and conserve the tropic forests particularly among the developing countries. All the forests in other parts of the tropics and subtropics (those in Mexico, Central America, the West Indies, Andean South America, the eastern and southern portions of the Amazon), all the forests of Africa outside the central Zaire basin, and all the

forests of tropical and subtropical Asia will be devastated in shortest time; depending on the effectiveness of local conservation programs in tropical countries.

The biological diversity of tropical forests must therefore be constantly monitored and managed in order to direct succession processes towards maintaining species and habitat diversity. This chapter will focus on trend of tropical forests and biodiversity in the tropical forests, endangered plant species in the tropical forests, conservation and management challenges as well as possible ways forward for conservation and restoration of lost ecosystems.

STATUS OF BIODIVERSITY IN TROPICAL FORESTS REGIONS

No precise estimate can be made of the numbers of species being extinguished in the tropic forests, due to the unknown numbers of species originally present and dearth information on species. There can be no doubt that extinction is increasingly far faster than it was in the 19 century. About eight years ago, tropical countries were losing 127,300 km^2 of forest annually, while deforestation in Nigeria was put at about 3.5% per annum translating to a loss of 350 000 400 000 hectares of forest land per annum (FAO, 1999; 2008). Forests face with pressures of deforestation, urbanization, poor management and a regeneration problem are virtually nonexistent. The impacts of climate change will further aggravate the plights of many indigenous and exotic tree species as climatic variability may limit the ability of forest trees to quickly adapt to the changing climate. Only 9.8% of the entire tropical forest biome lies within strictly protected areas (Schmitt *et al.,* 2008); and the long-term viability of existing reserves is strongly affected by patterns of human activity in adjacent areas (Wittemyer *et al*. 2008). Tropical forests are disappearing at alarming rates worldwide, reducing annually by about 4% of their current area (Maradana and Owk, 2016).

Prospects of tropical forests and the biodiversity therein are becoming increasingly bleak owing to unabated deforestation and forest alteration (Hansen, 2013) that stem from human activities such as logging, hunting, agricultural expansion, and human settlement (Wilcove *et al.,* 2013; D´avalos *et al.,* 2016). A threat to these plant species means a threat to the survival of the rural poor. It is clear that the future of many biodiversity in the tropical forests depends more than ever on the effective management of human actors and their impacts on landscapes (Harvey *et al.*, 2008; Perfecto and Vandermeer 2008).

When area changes by a factor of 10, species number changes by a factor of about 2. In other words, the loss of 90 percent of the area originally covered by a habitat is expected to lead directly to the extinction of about 50 percent of the species endemic to that habitat; less severe habitat loss is also expected to lead to extinctions but of fewer species (Wright and Muller-Landau, 2006).

Agbelusi (2000), in a paper tagged "conservation of biodiversity" asserted that Nigeria like many African countries is faced with the problems of environmental destruction fueled by increase in population growth, political instability and increasing poverty. Species are lost and biodiversity is obtainable only in the National Park, Game reserve, Forest reserves, Wildlife sanctuary.

ENDANGERED PLANT SPECIES

There is the need for setting priorities for plant species conservation efforts, with more attention to the ones whose population have reduced drastically; species with narrow range of bio-geographical distribution, endemic species and those who belong to mono-specific genera (Borokini, 2013). Any plant species with a declining population need urgent conservation efforts; such species are generally known as 'threatened or endangered species'. An endangered plant species is a population of plants which is at risk of becoming extinct. Ecologists, biologists and Rangers are yet to say when an endangered species has finally come to an end. There is always a chance that a few more individuals will survive in some remote forests. But the vast majority of species are not monitored at all; such as the dead species.

It is estimated that more than 8000 tree species are endangered worldwide (www.unep-wcmc.org); another estimate predicts this between 22 and 47 percent of the world's plants (Graham 2002). The rate of extinction is also approximated to be very fast and it is estimated that around 1,800 populations are being destroyed per hour (16 million annually) in tropical forests alone (Choudhury and Khan, 2010). No precise estimate can be made of the numbers of species being extinguished in the forest estates or in other major habitats in the tropical forests, due to the fact that mankind do not know the numbers of species originally present in the region.

About 146 species on the International Union for Conservation of Nature (IUCN) list of threatened species are found in the tropical forests of West Africa (Nigeria) out of which 18 fall under the category 'endangered' and 15 under the category 'critically endangered' (Federal

Ministry of Environment, 2006; Olajuyigbe *et al.*, 2013). Okafor (2010), explained that the scope or range of endangered plant species include (i) wild species which are restricted to habitats; (ii) widespread but intensively harvested and utilized; (iii) so called uneconomic species; (iv) recalcitrant species which lose viability early; (v) underutilized or neglected species; (vi) primitive cultivars and wild relatives of crop plants. The highest rates of woody plant species loss are in the tropics (FAO 2009).

Twenty two (22) economic tree species were gazette for protection in 2010 by Benue state government in Nigeria (Table 1), only three (3) species were found within the study area by the year 2017. These include *Prosopis africana, Parkia biglobosa* and *Khaya senegalensis* having frequencies of 9, 6 and 4, respectively. *P. africana* was found in seven (7) plots out of the ten plots sampled while *P. biglobosa* and *K. senegalensis* were found in six (6) and four (4) plots respectively. This was an indication that their status was actually threatened within the region. Probably this might have informed government decision to place these species under protection.

P. a*fricana is* a high value tree species. The species wood is used for carving mortar and pestle; these products are used in every household for pounding yam among others. The wood is also used for the production of high value charcoal; these harvests are destructive in nature hence the need to protect the tree species in the tropical forests among the developing countries. The seeds are used as condiments, just as seed of *Parkia biglobosa*. International trade on *P. africana* barks from Africa was worth US$220 million per year (Cunningham *et al.*, 1997), while annual export from Cameroon alone was 2000 tones per year, worth 1.3 million euros (Nsawir and Ingram, 2007). This species is found in Nigeria only in the Mambilla Plateau, reported in Gashaka Gumti National Park and Ngel Nyaki Forest Reserve (Chapman and Chapman, 2001), but trade in *P. africana* bark trade in Nigeria is not well known, but Chapman (2004) reported extensive debarking in the Ngel Nyaki Forest Reserve in 2003.

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) placed *P. africana* as an Table 1listed species in Cameroon and Democratic Republic of Congo in 1995, meaning that the species may become threatened if trade is not regulated (CITES 2006). USAID (2008) reported that almost 1,000 forest reserves exist on the world database of protected areas of the IUCN; most of them have been seriously degraded or de-reserved.

Table 1: List of Protected Plant Species and their status in Nagi Forest Reserve, Benue Nigeria

S/No	Scientific name	Plots sampled										species Frequency
		P_1	P_2	P_3	P_4	P_5	P_6	P_7	P_8	P_9	P_{10}	
1.	*Militia excelsa*	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	NE	-
2.	*Entandrophragma spp*	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	-
3.	*Khaya grandifoliola*	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	-
4	*Terminalia superba*	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	-
5	*Triplochiton scleroxylon*	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	-
6.	*Afzelia africana*	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	-
7.	*Antiaris africana*	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	-
8.	*Berlina spp*	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	-
9.	*Vitellaria paradoxa*	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	-
10.	*Borassus aethiopum*	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	-
11	*Canarium schweinfurthii*	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	-
12.	*Elaeis guineensis*	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	-
13.	*Khaya senegalensis*	N.E	1	N.E	1	N.E	N.E	N.E	1	N.E	1	4
14.	*Parkia biglobosa*	1	1	1	N.E	1	N.E	1	N.E	N.E	1	6
15.	*Prosopis Africana*	2	1	1	1	N.E	2	N.E	1	1	N.E	9
16.	*Terminalia ivorensis*	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	-
17.	*Chrysophyllum albidum*	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	-
18.	*Irvingia spp*	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	-
19.	*Cola acuminate*	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	-
20.	*Dacryodes edulis*	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	-
21.	*Anacardium occidentale*	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	-
22.	*Psidium guajava*	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	N.E	-
	Total	**3**	**3**	**2**	**2**	**1**	**2**	**1**	**2**	**1**	**2**	**19**

Key: N.E = Not encountered; P_{1---10} = Plot

In a surveyed carried out in Ngel Nyaki Forest Reserve, Nigeria in 2017, nineteen (19) economic tree species were identified to be decreasing in abundance while eight (8) were increasing. The conservation status of the 27 species encountered in the study area (Table 2) was confirmed on the IUCN red list of threatened species. Out of the 27 species, two species (*Rauvolfia vomitoria* and *Sterculia setigera*) were reported to be threatened with extinction, *Khaya senegalensis* was reported vulnerable while 5 species (*Acacia senegal, Albizia vomitoria, Allophylus africana, Strychnos spinosa, Vitellaria paradoxa* and *Vitex doniana)* were endangered**.** Some species were reported least concern, while *Anogeissus leiocarpa, Strombosia postulata, Rytigniaum bellatum, Uapacatogoensis* and *Pterocarpus erinaceus* were not found on the IUCN 2016 catalogue.

Global category for a species may be different from the national category for that species.

The general aim of the IUCN Red List Categories and Criteria is to provide an explicit, objective framework for the classification of the broadest range of species according to their extinction risk

(IUCN, 2004). The specific aims of the Red List are to: i. Provide a system that can be applied consistently by different people; ii. Improve objectivity by providing users with clear guidance on how evaluate different factors which affect the risk of extinction; iii. Provide a system which will facilitate comparisons across widely different taxa; iv. Give people using threatened species list a better understanding of how individual species were classified (Borokini, 2013).

The IUCN Red List Categories and Criteria are widely accepted as the most objective and authoritative system available for assessing the global risk of extinction for species (De Grammont and Cuarón, 2006; Lamoreux *et al*., 2003; Mace *et al*., 2008; Rodrigues *et al.*, 2006). It began in the 1960s with the production of the first Red Data Books (Fitter and Fitter 1987) and has since evolved from multiple lists and books dedicated to animal groups or plants into a unique comprehensive compendium of conservation-related information (Vie *et al.,* 2008).

Table 2: Conservation Trend of some Economic Plant Species in Ngel Nyaki Forest Reserve, Taraba State, Nigeria

Species	Frequencies		conservation Status
	Decreasing in Availability	Increasing in Availability	
Acacia Senegal	26	18	Decreasing
Afzelia Africana	32	1	Decreasing
Albizia gummifera	26	4	Decreasing
Allophylus africanus	4	0	Decreasing
Anogeissus leiocarpus	11	39	Increasing
Bombax cosveolens	5	0	Decreasing
Borassus aethiopum	23	0	Decreasing
Deinbollia pinnata	2	8	Increasing
Garcinia mithmanii	0	10	Increasing
Hymenocardia acida	9	39	Increasing
Khaya senegalensis	19	12	Decreasing
Pleiocarpa pycnantha	2	10	Increasing
Prosopis Africana	7	18	Decreasing
Psychotria microphylla	7	1	Decreasing
Pterocarpy erinaceus	53	0	Decreasing
Rauvolfia vomitoria	8	0	Decreasing
Rytignia umbellatum	0	10	Decreasing
Schefflera abyssinica	9	1	Increasing
Sterculia setigera	16	1	Decreasing
Strombosia postulate	0	17	Decreasing
Strychnos spinosa	11	3	Increasing
Terminalia irvorensis	24	20	Decreasing
Uapaca togoensis	0	56	Increasing
Vitellaria paradoxa	19	8	Decreasing
Vitex doniana	14	5	Decreasing

Ziziphus mauritiana	7	5	Decreasing

In 2008, 44,837 species have been assessed; at least 38% of these have been classified as threatened and 804 classified as Extinct (Vie *et al.,* 2008). IUCN (2013; 2014), reported that 164 threatened plant species were found in Nigeria, of which 16 were critically endangered (CR), 16 were endangered (EN) and 132 were vulnerable (VU). Furthermore, 21 (12.8%) of them were reported to be endemic to Nigeria, while the rest were naturally distributed beyond Nigerian borders, most of which are located in West Africa. The endemic species were found mainly in Eket (10), Oban Division of Cross River National Park (8) and Degema (3) among other locations, all of which are in the forest eco-zone of Nigeria. The 164 threatened plants comprised 120 trees, 16 shrubs, 20 herbs, 6 epiphytes and 2 lianas; while they spread across 53 plant families. Rubiaceae has the highest number (18) of species representatives among the 164 threatened plants, followed by Caesalpiniaceae (14), Meliaceae (12), Papilionaceae (11), Annonaceae and Sterculiaceae (9 each) among others (Borokini, 2013).

Other vulnerable species include *Garcinia kola*, which is categorized as vulnerable for its over-exploitation for chewing sticks in most parts of West Africa (Olabanji *et al.,* 1996). *Prunus africana* is subjected to unsustainable debarking for medicinal purpose. The species bark is being exploited heavily from all the African countries within its distribution range, for international trade to Europe for the treatment of 'benign prostatic hyperplasia'. *Gleditsia assamica* and *Gymnocladus assamicus* (Caesalpinioideae) are two endemic tree species of northeast India. Both the sister genera have typical distribution pattern and a few species are available in North and South America, Egypt and Vietnam tropical forests (Sanjappa 2002). Natural population of *G. assamicus* is extremely small having very few reproducing individuals (Choudhury *et al*., 2007b). Though the species is not included in the IUCN red list of threatened species, it has been designated as critically endangered regionally (CAMP report 2003) and also included in the priority list for national recovery program in India (Ganeshaiah 2005). *Aquilaria malaccensis* (Thymelaeaceae) is an economically important tree species known for its precious resin impregnated 'agarwood'; the species is under tremendous pressure and facing threats towards extinction.

CONSERVATION AND MANAGEMENT CHALLENGES

The great majority of tropical humans live as draft animals; they are sold to the highest bidders along with the habitats that maintain them, and the purchasers are not generally benevolent. Through the swirl of changing market values, there will eventually come a day when the living organisms in a tropical wild land would be as doomed (Daniel, 1988). Many organisms we believe to be safe are really endangered, and those we call endangered are in reality extinct.

The whole world at large are lacking conservation ethics, the forests throughout Nigeria and the rest of tropical countries are diminishing at an alarming rate of 3.5% (about 350,00-400,000 ha) per annum (Oyebo, 2006). In recent years, greater emphasis has been placed on tropical deforestation and its environmental impact. The major challenge is conversion of tropical forests to another use, not the demand for the timbers and non-timber products. Even though global environmental awareness has been on increase, the tropical forests and resources continue to be adversely affected at alarming rates each year and protected land is often mismanaged (Costanzo, 2006).

The highest rates of biodiversity in the world are found in tropical regions populated by developing countries, which do not have adequate technical and financial resources to manage all these species. Many Nigerians because of poverty and high level of illiteracy have seen woody plant species vegetation as an infinite natural resource thus it has been misused and abused. These drivers force people to harvest woody plant species using poor methods and at unsustainably high intensities (Tabuti, 2012). High intensity of logging and illegal exploitation of woody plant species and other resources has continued to pose serious threat to the country's biodiversity (Okafor *et al*., 2010). This vegetation has received poor conservation attention; as a result woody plant species is being whittled away.

The conservation of plant species has become a huge challenge in our time in the background of farming, fuelwood extraction, building and industrial activities due to increasing human population with high deforestation rates in the tropical regions. The intensive logging practices has seriously damaged the composition and structure of tropical forests thereby increasing the economic, social and environmental problems such as desert encroachment, soil erosion, flood,

drought, poverty, poor soil quality, and health challenges. This agrees with Al-min (2013) that the decline in tree cover affect aspects of daily life of the people.

Most countries within the tropical region are signatories to many international environmental-related treaties and conventions, while they have promulgated many such laws to ensure sustainable use and conservation of natural resources within their political boundaries. But the challenge has always been the poor implementation, fuelled by corruption within government circles. For example, many of the National Parks in Nigeria and neighboring countries are so huge, yet poorly staffed such that proper monitoring of the parks is not done (WCS, 2010).

There is no prospect at the moment that the scientific task will be completed before large fractions of the species vanish. No more than 1,500 professional in the world are competent to deal with the millions of species found in the humid tropic forests. Their number may be dropping, due to decreased professional opportunities, reduced funding for research, and the assignment of a higher priority to other disciplines. Data concerning the number of taxonomists, as well as detailed arguments for the need to improve research in tropical countries are given by NRC (1980). The decline has been accompanied by a more than 50% decrease in the number of publications in tropical ecology from 1979 to 1983 (Cole, 1984).

The problem of tropical forests conservation is the lack of knowledge and the paucity of ongoing research. In order to make precise assessments and recommendations, it is necessary to know which species are present; the great majority has not even received a scientific name, their geographical ranges and possible vulnerability to environmental change (Wilson, 1988).

POSSIBLE WAYS FORWARD

Knowledge on the status of tropical forests (both temporally and spatially) is essential for planning and managing forest ecosystems in a rational manner for short and long term goals; with sustainability in mind. Protection and rational utilization of tropical forests become more important in order to meet the increasing demand for wood raw material and Non-Timber Forest Products (NTFPs). The conservation and restoration of forest ecological zones have become an issue in our contemporary. It comprises of different management techniques to maintain and enhance the long-term health of forest ecosystems and suitable habitats for biodiversity.

Positive decisions must be made and effected to ensure conservation and restoration of the endangered species in the tropical forests; and all decision-making requires information. This information can be acquired by means of forest inventories or ecological assessments; systems for measuring the extent, quantity and condition of forests and biodiversity habitats. In carrying out the appropriate management practices, forest inventory is needed to obtain the necessary information for timber evaluation (Shuaibu and Dagba, 2013); and ecosystems management. More specifically, there is need for regular inventories of the tropical forests. This calls for need to determine the threats and conservation status of plant species in the tropical forests.

Deforestation and degradation of tropical forest in Nigeria has been estimated to be between 350,000 and 400,000 hectares of productive forest area annually. The only one answer to the problem of reduction in stands quality and quantity is to give proper management practices to the available forests, control deforestation and raise new trees and forests wherever possible with adequate management practices.

The world's tropics are already beyond their capacity for accommodating human activity. Guards and Rangers cannot save tropical wild lands. Thus, there is a need for join management between managers of wild lands and society. And the scientific community must aggressively participate in writing and executing the management policies for conservation and restoration of biodiversity. Without this participation and bottom-to-top decisions making, tropical forests will be nothing but high-degradation and gradual diminishing restoration of forest ecological zones.

The future lies in the hands of young and agile people, who are well-educated in technologies but they have low interest in conservation of biodiversity especially among the developing countries. These youths will replace their parents in the nearest future; what will happen to the tropics biodiversity and endangered species? The collective power to turn the game around resides with policy makers. We cannot force the youths and the world to conserve tropical nature; but they can be seduced. This can be achieved by involving the young ones in decisions making and implementation of conservation policies. Youths are the productive segment of the population, their dominance implies that they will be highly involved in conservation if biodiversity conservation strategies are introduced and they will be active, hale and hearty in conserving and restoring the biodiversity in the tropical regions.

There is need for countries within the tropical regions:

i. to development their national red list;

ii. to ensure effective protected area management and ex-situ conservation;

iii. tree domestication;

iv. to embark on community-based natural resources management;

v. to carryout evaluation of suspected “endangered” plants in the tropic regions.

Rapid human population growth rate is the major cause of plant species loss. These population growths pose a serious challenge on biodiversity due to indiscriminate exploitation by artisans and herbalists coupled with the high rate of agricultural activities; these implied that soil degradation in the area is inevitable (FAO, 2009). The growth of the human population must be halted if possible, since it is obvious that if the scale of human activities continues to increase for even a few more decades, the extinction of much of tropical forests' biota cannot be avoided.

Finally, let’s all ignore the voice that demands that high financial resources should be placed on for sustainably management of endangered species before it can be conserved and restored. Even without the provision of financial resources for conservation and restoration of endangered species, but with high interest and euphoria among the youths, the young populace can conserved and restored the tropical forests and its biodiversity in the regions. This can be done by frequent inclusion of youths in decisions making and the use of non-formal education methods (such as drama, playlet, music concerts among others).

CONCLUSION

Forests and forest resources are important assets that the nations in the tropical regions can sustainably manage for its renewable potentials, environmental benefits and socioeconomic importance to mankind. They have the potentials of becoming a major source of revamping the local economy of the rural and urban communities, since the economy of most of the East African Countries depends on tourism. If only forests and its products would be given the needed attention for conservation, endangered plant species (such as- *Prosopis africana, Parkia*

biglobosa, Khaya senegalensis, Gleditsia assamica, Gymnocladus assamicus and Aquilaria malaccensis among others) would be restore and genetic heredity with qualitative characteristics would be sustain for generational use. Therefore, based on this review, it is recommended that; communities around forest reserves in the tropical forest regions should be economically empowered, so that they can have alternative sources of livelihood that are biodiversity friendly, thus, reducing their dependence on forests and forest products. Laws and edicts establishing the forest reserves in most developing nations should be revised so as to make amendments and incorporate measures that will serve as panacea to the present problems that are impeding the growth and success of most forest and game reserves. For decision-making, there should be active involvement of local people living around forest reserves; this should be made a top priority in sustainable forest management and conservation for the actualization of restoration of endangered plant species in the tropical forests.

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